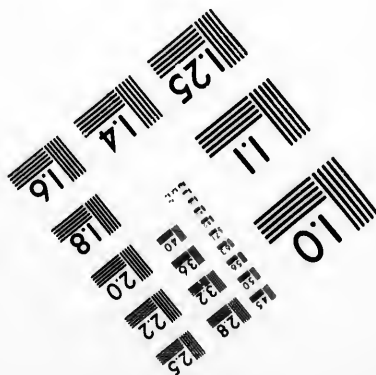
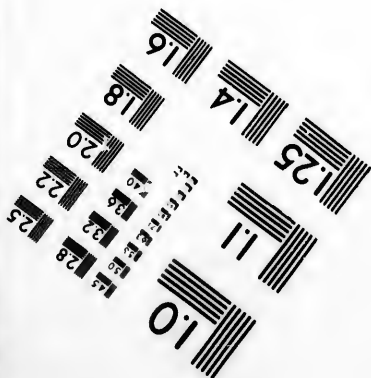
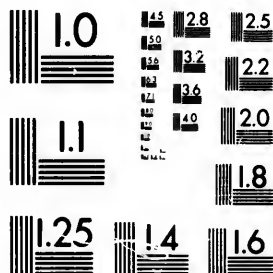


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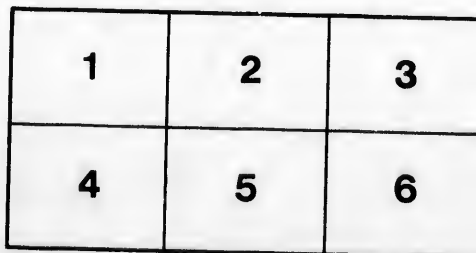
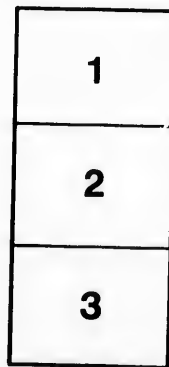
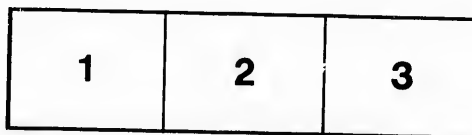
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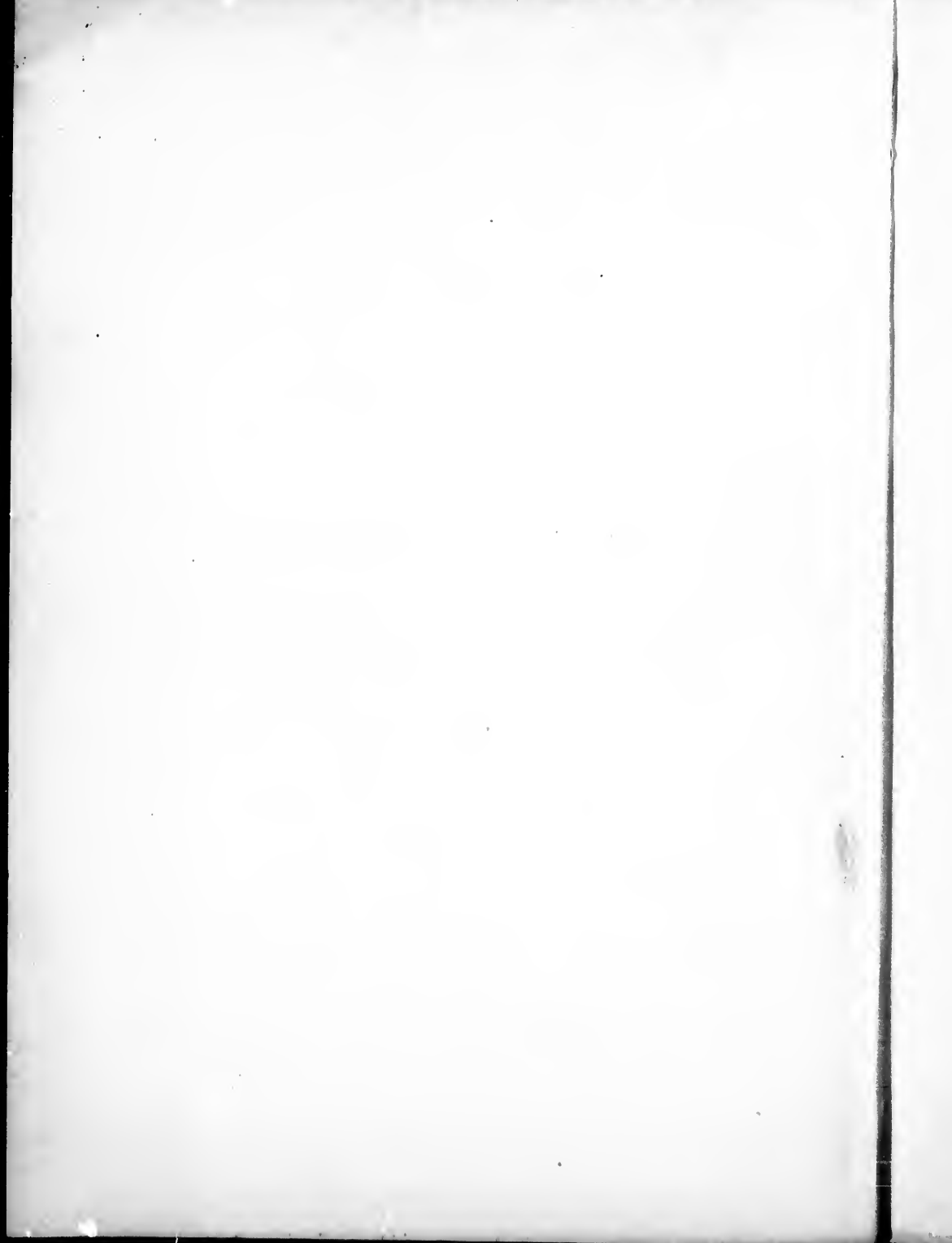
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ON A

GENERAL SCHEME OF IMPROVEMENTS

FOR THE

HARBOUR OF MONTREAL,

BY THE

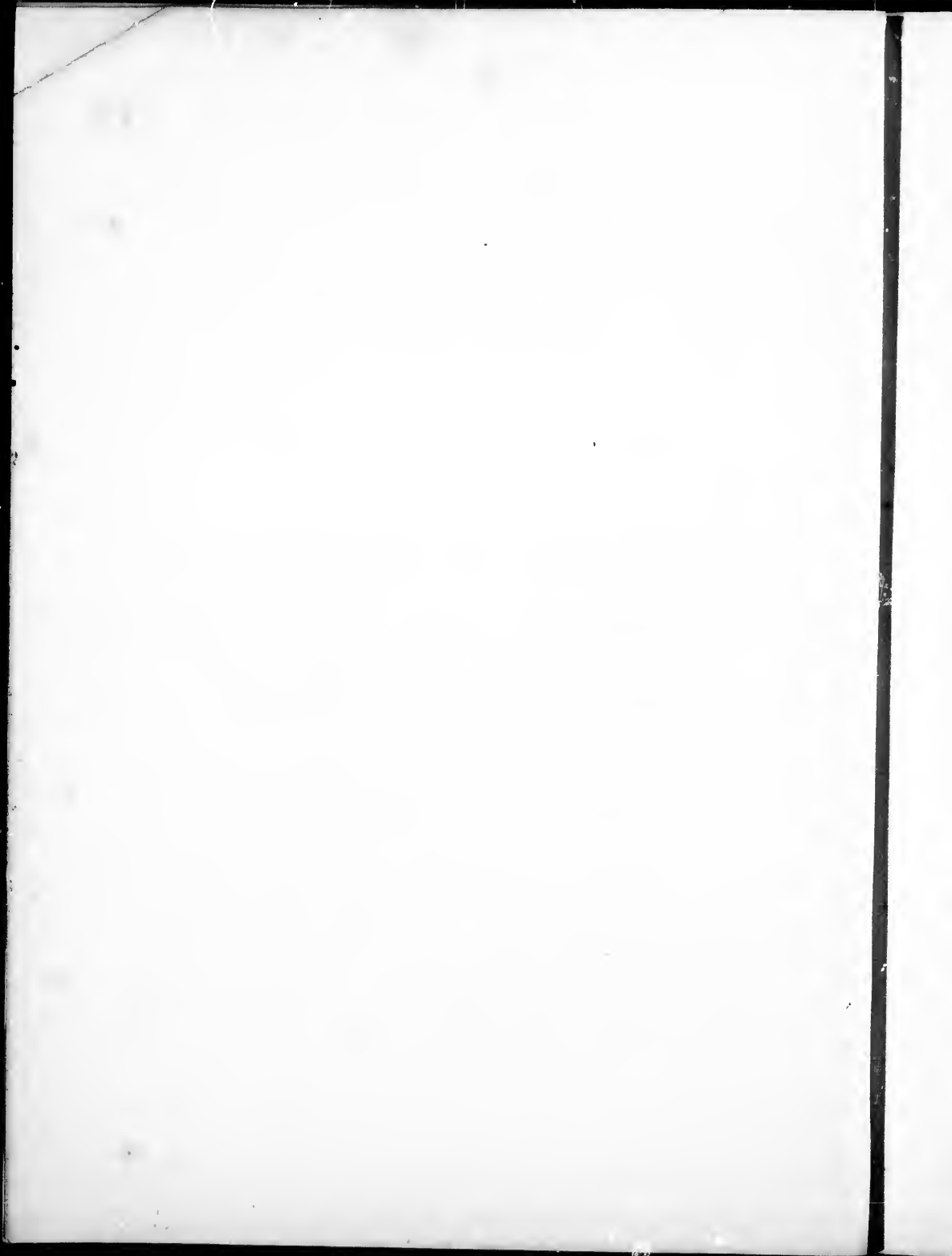
COMMISSION OF ENGINEERS,

MR. ROBERT BRUCE BELL, M. INST. C.E., PRES. INST. E. & S., S.,
GLASGOW.

MAJOR-GENERAL NEWTON, CORPS OF ENGINEERS, U.S.A.,
NEW YORK.

MR. SANDFORD FLEMING, C.M.G., M. INST. C.E., F.G.S.,
OTTAWA.

1 8 7 7.



R E P O R T .

THE HARBOUR COMMISSIONERS OF MONTREAL.

GENTLEMEN,

We, the Engineers selected to consider the Improvement of the Harbour of Montreal, have the honour to report:—

The instructions with which we were favoured are embraced in a memorandum dated 18th September, 1875, (*vide* Appendix page 3). We have directed our attention to all the topics alluded to in that memorandum, and more particularly to those contained in the following extracts:—

“ Having briefly referred to the history and statistical position of the question, it now remains to deal with existing circumstances and the causes which at the present time have induced the Commissioners to ask your advice.

By an Act of the Canadian Parliament, passed in 1873, the Commissioners are empowered to continue the deepening of the navigable channel between Montreal and Quebec, and they have since entered vigorously upon the work. They propose completing a channel of twenty-two feet within three years, and there can be no doubt that within reasonable limits the work of improvement will be continuous, as provision must be made for the largest class of vessels employed in general commerce.

Up to the present time our harbour works have been carried forward without any harmony of design, but the necessity of some comprehensive plan is now fully realized by the Commissioners and the public.

Such a plan it is now desired to prepare and adopt. The following considerations respecting it are placed before you:—

1st. The Commissioners desire to make the utmost use of the space occupied by the existing harbour works in front of the city, upon which a very large expenditure has been made, and where the principal trade is already located.

2nd. The plan should be, if possible, progressive, so that it can be taken up by sections, be capable of easy extension, and rapidly available for use and revenue.

3rd. The occupation of the Harbour may be thus described :—

(1st.) Ocean steam traffic, requiring permanent locations in the most convenient positions to the city, for the distribution of general cargo.

(2nd.) Large clipper ships, engaged in the same trade.

(3rd.) River craft, of light draught, but requiring favorable locations for passengers and miscellaneous traffic.

(4th.) River craft with city supplies of less value,—wood, hay, &c.

(5th.) Ocean vessels with coal, rails, &c., for city use and transport westward.

(6th.) The lumber trade, requiring large wharf surface, as well as accommodation for easy transfer from light craft to larger vessels. This business can be located at any point within reasonable distance.

(7th.) The Grand Trunk Railway has already tracks laid along the harbour frontage, and two other lines of railway desire access to the wharves. The question of railway connection must, therefore, be considered, as well as the increasing demand for wharf space in cartage traffic, all which point to wide thoroughfares along the whole front of the city as soon as practicable and in this connection it should be borne in mind, that all accommodation secured on the north side of the harbour is greatly more valuable than any to be obtained on the south side.

(8th.) The transfer of all the great inland traffic, to be exported by sea, is effected here, and requires free movement from the mouth of the canal to all parts of the harbour.

The rapidity of the current and rising of the river, upon the close of navigation, covering our entire works with ice and water to the depth of many feet are among the natural disadvantages that will engage your attention. Any scheme that would secure a high level harbour for a portion of our trade, and a graving dock for repairs, would be looked upon with great favour as providing for a difficulty acknowledged by all, and hitherto in no way attempted to be overcome.

In conclusion, the Commissioners draw your attention to the fact that the whole system of Canals above Montreal is now undergoing enlargement, while extensive railway projects are determined upon, connecting this point more completely and advantageously with the Great West. In their opinion the future progress of Montreal will be very rapid and the trade of the St. Lawrence

will attain dimensions which it will tax our utmost capacity to accommodate, while this condition of affairs may be expected to come upon us so quickly that the time of action has now come and our preparations can be no longer prudently deferred.

The Commissioners offer no opinion upon any of the schemes for Harbour improvement already proposed. They desire to leave you at full liberty to investigate the whole subject, and to obtain information from every available source. In this they will render you every assistance in their power, and they invite the co-operation of all interested in the question to the same end. Mr. Kennedy, Chief Engineer to the Trust, has an extensive knowledge of the Harbour and the localities around it, and he has been instructed by the Commissioners to aid you in every way towards the prosecution of your important work."

Upon the receipt of instructions we immediately began the investigation, and by public advertisement invited all parties having information bearing on the River and Harbour, or suggestions to offer on the question of improvements, to submit the same.

We held meetings in the city of Montreal from the 22nd September up to 4th November, 1875, and received from various parties the evidence given in the Appendix.

We visited Ottawa to elicit the views of the Government and to gain information from the Department of Public Works; we also visited Kingston, Toronto, Buffalo, Albany, and New York, and subsequently Liverpool, Glasgow, and other commercial centres.

We have taken other means of procuring the fullest and most reliable information affecting the questions submitted for our consideration.

We found on an examination and comparison of the charts of the river St. Lawrence in front of Montreal very serious discrepancies, and on testing the soundings, discovered errors of a grave character. We, accordingly,

deemed it necessary to have new surveys made, full soundings of the water taken, as well as borings sunk in the several shoals in front of the city. This information was supplied by the Engineer of the Commissioners, but the delay consequent thereupon has prevented us from maturing our views at an earlier date.

The result of these surveys and the other information obtained was sent to Glasgow, and under our directions was laid down on a large plan embracing that portion of the River St. Lawrence from Victoria Bridge to Longueuil. The soundings have been sufficiently numerous to admit of lines of contours being drawn to show at a glance the depth of water in all parts. Upon completion of this plan, accurately representing the River and Harbour as at present existing, we met by appointment at Glasgow, where, after a series of consultations and much deliberation, we have now prepared a Comprehensive Scheme of Improvements, which we hereby submit.

It will be found that the Plan of Improvements submitted has specially in view the following objects:—

I. Utilising, as far as practicable, the existing Harbour Works.

II. Provision for carrying out the improvements in sections to accommodate the progressive advancement of the trade of the Port.

III. Provision for ocean steam traffic, large clipper and other sailing craft, requiring locations accessible to the city for the distribution of general cargo.

IV. Provision for vessels importing coal, rails, &c., for transport westwards.

V. Provision for every description of river craft.

VI. Provision for the grain and general inland traffic.

VII. Provision for the import of coal and wood for local consumption.

VIII. Provision for the lumber trade.

IX. Provision for bringing all the railway lines entering Montreal within convenient access to the shipping.

X. Provision for a high level Harbour for a portion of the trade, with Graving Docks and Slips for repairs.

XI. Provision for utilising the hydraulic power rendered available by a high level dock.

In submitting the general Plans of Improvement, we deem it proper to allude to several topics bearing on the subject.

ORIGINAL CHARACTER OF THE RIVER AND HARBOUR.

The river banks in the neighbourhood of Montreal sufficiently indicate the appearance of the original shore of the Harbour ; sailing vessels and steamboats lay on the margin of the river, at the foot of a low hill. The current running past St. Mary's carried its force below the city, and a small creek discharged itself (a branch of the St. Pierre River) near what is known as Commissioners' Street.

The introduction of steam totally changed the commercial character of Montreal. Previously, the supremacy of Quebec was assured ; the delays in ascending the river were serious impediments, and rendered it difficult for vessels, of even small tonnage, to reach Montreal. It was no unusual matter for vessels to be detained for weeks for

a favourable wind to pass the current of St. Mary's, to reach the city front, remaining at what is now known as Hochelaga. Possibly it was only the introduction of steam which interfered to prevent Hochelaga being the site of the Harbour.

The first step in the way of improvement was the connection of a small island a short distance above the current of St. Mary's with the shore, and the conversion of this island into a wharf of good dimensions. Subsequently other wharfs were constructed along the adjacent banks of the river.

The revetment wall which protects the front of the city, and from which ramps are formed giving access from the streets to the wharfs, was commenced in 1832; the funds were granted by the Provincial Parliament, and the work was carried on under Commissioners.

WATER APPROACHES.

The construction of the Lachine, the Ottawa, the St. Lawrence, and the Welland Canals was a marked step in the development of Montreal Harbour; these canals, with locks 100 feet in length, with 20 feet in width, and 5 feet of depth, gave the first outlet westwards, and opened a water communication with the upper St. Lawrence and the Ottawa. Narrow and insufficient as the dimensions of the first locks now appear, the commercial results attained were of great importance. Without these works Montreal could neither have received the products of the western country, nor been able to supply it with imports.

The traffic of the country on Lake Ontario would have taken the Canal at Oswego, and the districts above Niagara Falls would have found an outlet to the ocean by Buffalo and the Erie Canal, and by United States railways. Thus, New York would have been the commercial emporium of Western Canada as a matter of necessity.

In entering into any description of Montreal Harbour, the works connected with the improvement of the channel through Lake St. Peter, as given in the reports with which we have been furnished, require mention. This shallow extent of water barred the way to the passage of all vessels but those of a light draft. During July the water fell to 11 feet, and did not regain the early spring depth during the season. The channel, moreover, was intricate, and an improvement in this quarter was early seen to be indispensable to the future of Montreal. If vessels of limited draft only, could pass Lake St. Peter, the trade necessarily must remain at Quebec. In 1843 a sum of money was voted by the Legislature to form a channel of 14 feet in depth. The Public Works Department, to whom the work was assigned, commenced operations on a straight course through the shoals of the Lake, and 296,000 dollars was expended in dredging operations on that work. These operations were carried on for four seasons, when a Committee of the House of Assembly entered into an examination of the progress made. The Committee reported that the operations appeared to be a failure, and recommended that they should be suspended. The adoption of their Report led to a discontinuance of the work, and nothing was further done for three years, when the Honble.

John Young submitted the proposition that the Commissioners of Montreal Harbour should have the right to impose certain tolls, and to borrow the money necessary to carry on the work. An Act of the Legislature giving these powers was passed. Mr. Young became a member of the Harbour Commission, and a Board of Engineers was appointed to examine and report upon the best course to be adopted, and they recommended the deepening of the old channel through the shoals of Lake St. Peter, abandoning the work executed in the attempt to form a more direct artificial channel. Operations were accordingly resumed in the old channel as recommended, and in course of time a depth of 16 feet 6 inches was obtained.

By the close of 1854 the work was completed at an expenditure of \$370,000. Since then operations have been resumed, to obtain a depth at low water of 22 feet 6 inches, and will be continued until a still greater depth is obtained.

The canal system of Canada connects the water at Montreal with the extreme western lakes. The limit of navigation from Montreal to Lake Ontario is at present 9 feet in depth, and through the Welland Canal 10 feet. The deepening of the canals now in progress, however, will give a navigation of 12 feet.

Locks, which may be raised at moderate expense hereafter, are constructed with 12 feet on the sills; other locks have a depth of 14 feet. The lock of the future is intended to be 270 feet long, 45 feet wide, and 14 feet depth on sills. This will be the probable limit between Montreal and Lake Erie.

The present navigation from Lake Erie to Lakes Huron and Michigan is 14.5 feet. The flats of the River St. Clair have a channel dredged to a depth of 16 feet, but when all obstacles are removed this channel will be increased to 19 feet, and the latter depth may be looked upon as the limit between Lakes Erie and Huron.

Turning to Lake Superior, the river between that sheet of water and Lake Huron is being deepened to 15 feet.

The Sault Ste. Marie Canal, now 12 feet on the sills, is being enlarged to 18 feet, and that depth will determine the navigation of Lake Superior when the other improvements are effected. The present limit is as yet only 9 feet however.

The canals having an eastern connection with Montreal pass up the River Richelieu and St. Ours, and up the River Richelieu and Lake Champlain by the Chambly Canal.

It will thus be seen that the inward and outward water approaches to the east and west of Montreal Harbour are very important, and require consideration in any scheme of improvements.

RAILWAYS.

Since the opening of the canal system referred to, several thousand miles of railway leading from Montreal to many points in all directions have been established. These lines of communication have done much to stimulate trade at Montreal. The most important in connection with the Harbour are the railways leading inland. The lines in operation to Portland, Boston, New York, and

Halifax are necessary for general intercourse, especially in winter, but they are not claimed to benefit Montreal as a port. The western sections of the Grand Trunk, the railways which ramify throughout Ontario, and some of those which extend through the north-western States are of immense advantage to Montreal. Through the agency of these lines the port of Montreal is made one of the chief business centres for an extensive country of great fertility. The new lines projected, and partly in progress, to Lake Superior, Manitoba, and the great prairie region, will vastly widen the field of trade tributary to Montreal, and the steady advancement of the whole country would seem to justify the expectations of the Commissioners with respect to the future progress of Montreal and the demand for increased Harbour accommodation.

REVENUE AND TONNAGE.

Two topics which have an important bearing on the subject of Harbour extension are the state and progress of the revenue and tonnage of the port. In dealing with this subject, it is not necessary to speculate upon the trade which might be diverted to Montreal from channels leading to other Atlantic ports. It is sufficient to take the actual returns of past years as the data for estimating future traffic, and the facts before us clearly shew that the trade and revenue have been steadily increasing. From the statement of the Harbour Master, as given in the Appendix (page 189), we find that in 1854 the number of sea-going vessels entering Montreal was 258, with a tonnage of 70,910 ; of these, there

were 6 steamships of 5,545 tonnage, and 252 sailing vessels of 65,365 tonnage; whilst in 1874 we find in all 731 vessels of 423,423 tonnage, of which no less than 266 were steamships of 262,096 tonnage. It is also seen from this table that this increase has taken a steady onward progress over the whole of that period. In steamships especially the increase has been remarkably regular year by year. The statement of the number and tonnage of inland vessels, (the returns for which we have only received from 1861), shews that in 1861 there entered 5,247 vessels of 530,224 tonnage; and in 1874, 6,855 vessels of 956,837 tonnage. (*Vide* page 187 of Appendix.)

As regards the revenue from Harbour dues, taking periods of ten years, we find, from the statement of the Secretary to the Harbour Commissioners (page 179 of the Appendix) that it has also had a progressive increase, subject, of course, to fluctuation in certain years, but bearing a steady increase on the average. For the last two years since these statements were completed there has been a decrease in the revenue below that of 1874, but this decrease has been mostly confined to local traffic. This is, no doubt, due to Montreal having participated in the universal commercial depression, and may be viewed as an exceptional fluctuation. In 1854 the revenue from dues, was 64,000 dols.; in 1864 the revenue was 105,326 dols., and expenditure 76,157 dols., leaving a surplus of 29,169 dols.; and in 1874 the revenue was 280,021 dols., and expenditure 127,468 dols., leaving a surplus of 152,553 dols.; the latter representing a capitalised sum of three million dols. available for the construction of works,

even without taking into consideration the probable increase of surplus in future years.

It is evident from the returns referred to that the improvements in the water approaches to Montreal, alike in the lower and upper navigations, together with the establishment of the railway system of the country, have borne fruits which fully meet the sanguine expectations which were formed by merchants and the Engineers whom they consulted a generation ago. There can be no doubt whatever that the tendency of every internal improvement is to increase the trade of Montreal and that, as the navigation of the canals and river channels is further enlarged and deepened, as lines of railway are carried into new productive fields, as settlements are extended, and as the population of the central and western sections of the Dominion is increased, the prosperity of Montreal will be augmented. It is obvious, therefore, that the Commissioners are justified in extending the already cramped Harbour accommodation and in anticipating before long a considerable increase to the trade and shipping of the port.

THE WHARFAGE AS AT PRESENT EXISTING.

The present accommodation afforded by the Harbour of Montreal for loading and discharging vessels is by a line of wharfs upon the river face, extending from the Lachine Canal to Hochelaga, (*vide* Plan No. 1), open to the river, and submerged in the winter by water and ice. The total frontage in the Harbour at the close of the year

1876, as taken from the Engineer's Report, is as under :—

	Lin. feet.
Wharfage for ships of 24 feet draft, - - -	5,562
Do. 20 feet do., - - -	11,357
Do. 10 to 20 feet do., - - -	5,265
Total, - - - - -	22,184

The portion of this wharfage devoted to general trade extends to the foot of the Commissioners' Wharf, and measures 6,650 feet. The total extent of the wharfage strictly appropriated to the deep sea steamers is only 2,500 feet. The Allan Line occupying Queen's Basin and Wellington Pier, and according to the Superintendent of that Company, (*vide* page 74 of Appendix) although having 900 feet of wharfage, only 735 feet of this is available, and is supposed to accommodate two steamships, each 400 feet in length. The Dominion Line have the Merchants' Wharf with only 550 feet of wharfage; the London Line occupy Princess Basin with 440 feet available wharfage; and the Canada Shipping Company have part of Commissioners' Wharf with about 520 feet—in all about 2,500 feet; whilst the wharfage actually necessary for the present requirements of these steam vessels according to the evidence should be at least double that length.

The extent of wharfage appropriated to deep sea sailing vessels, comprises part of the Metcalfe Basin, the Elgin Basin, Island Wharf, and King's Basin, about 3,200 feet; Jacques Cartier Pier and Market Basin, 540 feet; the Victoria Pier about 1,300 feet; and Military Basin, lately deepened, 1,350 feet;—making in all about

6,390 feet. This is the whole of the available space for deep sea sailing vessels engaged in general trade, and much of it is used for the discharge of coal, hay, sand, brick, lumber, and wood, as well as by market boats. Further down the river there are about 7,500 feet at which deep sea vessels are accommodated for the discharge of coal, rails, lumber, and other goods. The Richelieu Pier and Bonsecours Pier accommodate the river steamers, giving together about 1,000 feet. The construction of the wharf along one side of Windmill Basin, is far advanced, and is partly appropriated for the discharge of coal. This wharf will be nearly 3,000 feet long when completed.

The wharfs above described occupy the whole river frontage of the city, and under the present system there are no further means of extending the Harbour accommodation.

CLIMATIC DIFFICULTIES.

The climatic difficulties to be contended against are of a serious character. The River St. Lawrence at Montreal is annually exposed to the choking of its channel by ice, and the consequent rising of the water; to which may be added the phenomena called ice-shoves.

The late Sir William Logan, provincial geologist, made an exhaustive inquiry into this important question, and submitted to the Geological Society of London, an interesting description of the winter phenomena, this is of sufficient interest to be reproduced at the present time. (*Vide Appendix, page 191.*)

Owing to the wharfs being annually submerged and exposed to the ice phenomena, no permanent buildings have been erected on them. Temporary sheds are placed on some of them in spring, but these are removed at the close of the season.

THE PROPOSED SCHEME.

We have carefully weighed the evidence furnished us by citizens of Montreal engaged in trade, shipping and in railway operations (*vide* Appendix), we have considered all information obtained from other sources; have also given due regard to all points of importance brought under our notice, and have matured a general scheme of improvement which in our judgment is best designed to meet the case under consideration.

The Harbour in its present state is shown in Plan No. 1. The projected Plan of the Harbour in its completed form is shewn in Plan No. 2, and with some modifications in Plan No. 7, and may thus be generally described.

1. It is proposed to form what may be termed a "trunk wharf" of ample breadth, from the shore near the Custom House, across the present channel and shoal to a point about 2000 feet out in the river. From the trunk it is proposed to construct commodious branch piers on each side, as shewn on the plan.

The breadth of the trunk wharf is proposed to be 300 feet, and the breadth of each of the branch wharfs on the down-river side 130 feet, and those on the up-river side 120 feet. The breadth of the water spaces on the down-river side is designed to be 320 feet, and those on the up-river

side 300 feet. These dimensions allow for the largest steamers and sailing vessels lying upon each side of the basin, with elevators and barges to each ship, and a free space between for vessels to pass. Vessels will, as at present, discharge upon the wharfs on the one side, and take in grain from the elevators and barges on the other side.

2. It is proposed to form a new channel from the deep water of the river to that portion of the Harbour between the proposed trunk wharf and the entrance to the canal. This channel in the first place to be formed simply of width enough to allow of the passage of vessels from the river to the canal and upper part of the Harbour, and, on completion of the proposed trunk and branch wharfs, to be widened out into a large basin.

3. It is proposed to remove a shoal extending in front of St. Helen's Island, opposite Victoria Pier, in order to obtain the fullest width to the deep water of the river at this point, with the view of properly directing and reducing the current in the vicinity of the space where the new Harbour works are projected. In order still further to diminish the current, it is suggested that St. Lambert's Wharf, as well as all loose rocks and boulders in the river east of St. Helen's Island, be removed.

4. It is proposed to form a continuous breakwater from the western abutment of the Victoria Bridge on the line shown on the plan. A portion of the breakwater to correspond in height with the high level works hereafter referred to. This breakwater is designed to serve two purposes:—*Firstly*, to secure still water in the space

where the new wharfs are laid out, so that vessels may be taken in and out of berth without difficulty, and grain barges and floating elevators may be moved to and fro and used in any of the basins with perfect freedom. *Secondly*, to prevent ice-shoves injuriously affecting the shipping that may winter in the high level basin, or the buildings or other works that may be constructed. The first object is of primary importance, and may be secured by carrying the work a few feet above summer water level. The second object would call for a heavy expenditure, but its necessity may be considered more remote.

The extremity of this breakwater would have quays formed on the inside facing the basin, with rail tracks led down from the Grand Trunk Railway, and standage room for waggons; this wharf may be used for coal, iron, and other goods generally requiring railway transport.

5. It is proposed to complete the new basin in front of Mill Street, in the position already arranged by the Commissioners, the construction of the wharf on one side being now far advanced.

6. It is proposed to widen Commissioners' Street by moving out and extending the revetment wall, and to make provision outside of this wall for a double track railway along the whole extent of the city front. The latter to be bridged over at convenient points for cart traffic between the city and the wharfs, to be connected with all the railway lines entering the city, and kept exclusively for traffic, and not for standage. The proposed railway should be the property of and under the control of the Commissioners, and open to all the rail-

way companies at certain fixed rates. It is further proposed to provide for access to all the new piers by branch lines of railway, and for cart traffic by broad roads and ramps with easy gradients. In connection with the improvements along Commissioners' Street, we would suggest that all the sewer outlets into the Harbour should be closed, and one main intercepting sewer be carried behind the revetment wall and discharged at some point below the Harbour, where the sewage would be constantly removed by the current of the river.

7. It is proposed to lay out the shallow water space lying between the breakwater and Windmill Wharf for large floating basins and other works, a modification of the scheme of hydraulic works projected by the Chairman of the Commissioners some years ago. It is proposed to elevate these works entirely above the highest winter level of the river in order to avoid the difficulties inseparable from submergence. It is proposed to construct twin locks of sufficient size to admit from the outer harbour the largest ocean steamers and from the Lachine Canal the largest class of vessels that navigate the inland waters. It is also designed to provide sites for graving and slip docks.

The high level works would admit of ships wintering and repairing; they would afford ample space for grain-houses, mills, and manufactories, all accessible by railway, by canal, and by sea-going ships. Permanent buildings for any purpose might be erected wherever required, as the ice-shoves—the only danger to be apprehended—would be arrested at a safe distance and rendered harmless. With this object in view, it is proposed to carry up the break-

water, to a sufficient height by a continuous sloping face, or on a continuous line to a certain height, then to crown it with detached ice-breakers. The protective works suggested might, indeed, be carried along the low level portion of the breakwater to its extremity, as shown on the General Plan, and thus afford effectual protection from ice-shoves to part of the harbour and the front of the city now exposed.

While we are satisfied as to the great propriety of looking forward to the establishment of high level works, and now recommend the selection of the proposed site as in every respect eligible for them, it is impossible at this stage to define in detail precisely what they should be. Their character and proportions must to some extent be governed by the nature and extent of the trade which the enterprise of Montreal hopes to develop, or by the traffic which in future years may be attracted to the port. All that we can now do on this head in order to comply with our instructions, is to offer general suggestions, and leave details to be worked out when more data are obtained.

Plan No. 2 shows one mode by which the high level works might be carried out. In this a large single basin is projected, connected by locks with the outer harbour, and also with the Lachine Canal; ample space being provided for mills, granaries, elevators, &c. Plan No. 7 is another modification of the same general scheme. In this there are two basins; one on the same level as that proposed for the basin in Plan No. 2; the other, which may be called the "barge" basin (intervening between the first and Windmill Basin) on the same water level as the Lachine Canal. The upper or barge basin would be used entirely by barges and

canal craft, and around its sides mills, granaries, elevators, and other works would find eligible sites. The combination of basins herein alluded to would allow canal boats to transfer cargoes from the barge basin on the one side, while ocean ships in the half high level basin and in Windmill Basin would deliver and receive cargoes on the other side.

PROGRESSIVE CONSTRUCTION.

Generally the scheme of improvements submitted contemplates adapting to the fullest extent possible, for the purposes of a Harbour, the whole water space opposite Montreal, without unduly interfering with the main channel of the River St. Lawrence; it is, at the same time designed, so as to disturb as little as may be, and make the utmost use of, existing works. The scheme likewise keeps prominently in view and makes due provision for a progressive construction to meet the gradually increasing demands of traffic. To fulfil these objects the plan may be carried into execution in the order shown on the accompanying Diagrams (Nos. 3, 4, 5, and 6); but the order of sequence in which different portions of the work should be constructed can, of course, be varied to meet such circumstances as the requirements of trade may develop in future years.

Before commencing any of the structural works proposed, it will be necessary to dredge a new channel of access to the upper part of the existing Harbour and to the Lachine Canal. Until this channel is formed of sufficient width to allow the passage of large vessels no works can be commenced which will in any way break up the communication by the present channel.

An early stage of the work is shown on Plan No. 3. The outer line of the breakwater on the shoal ground from Victoria Bridge abutment is shewn to be carried out to the 6 feet water line. The preliminary dredging of the new channel, as well as of the shoal on the west side of St. Helen's Island, is indicated. The external work of the first long branch wharf, in order to provide deposit space for dredged material, is also shown.

The new channel being sufficiently advanced to allow the passage of large steamers to that part of the Harbour adjoining the canal entrance, the trunk wharf may at this stage be proceeded with, and the ramps leading to it formed; Plan No. 4 shews its commencement, together with the completion of the first lower and two upper branch wharfs. The old channel being closed by the trunk wharf, rail tracks may now be carried to these branch wharfs, and as construction proceeds to other branches, they may be occupied by extensions of the rail track as rapidly as completed. This plan shows also progress in dredging operations, as well as the completion of the range of face-work from near Victoria Bridge along the entire line of the breakwater, and the formation of the inner face-work enclosing the low level portions of these quays. Generally as the work proceeds year by year the dredged material would be deposited in the enclosed water spaces formed in advance, upon which piers are ultimately to be formed.

Plan No. 5 shows a further extension of the trunk wharf, the construction of additional branch wharfs, and additional dredging; the widening of part of Commissioners' and Common Streets, and the re-erection of the

revetment wall in front of them; at this stage the low level portion of the breakwater may be completed and connected with the existing railway system by a rail track laid on the embankment within the line of face-work from near Victoria Bridge, and thus rendered available for transferring coal, rails, and other cargoes. A portion of the outer wharf of Windmill Basin is also shewn as formed at this stage.

Plan No. 6 shows the trunk and branches, and the whole of the dredging; the outer wharf of Windmill Basin is also shown as a portion of the low level system, but its precise character will depend on the decision of the Commissioners with respect to the high level works immediately adjoining.

All the wharfs and basins shown on Plan No. 6 can be occupied as fast as they are constructed, and during their formation none of the existing wharfs, except those contiguous to the trunk wharf, need be materially disturbed, and consequently they may continue to be used for their present purposes. At this stage the improvement of the Harbour will be in the position desired by the Commissioners under the first and second heads of their Memorandum. (*Vide* page 4 of this Report.)

A vast additional extent of wharfage will have been added to the Harbour, constructed in sections by easy stages, and rendered rapidly available for use and revenue without having materially disturbed the existing works.

A commencement will have been made to widen the thoroughfares in front of the city, by throwing forward the revetment wall in front of Common Street and part of Commissioners' Street.

Before the improvements shall have reached this stage the Commissioners and the city authorities will have made arrangements with respect to the sewer outlets, the main intercepting sewer, the permanent site for the railway, and widening the thoroughfares along the whole front of the city, in order to give increased space for cartage traffic.

In order to effect these changes, it will then be necessary to move out and reform the existing wharfs as far down as the Victoria Pier. With this object in view, alternative designs are shewn in Plans 2 and 7. Of course, whilst these wharfs are being reformed the trade will have to be transferred to the new main works; and although their reformation is shewn as being held over to the last, it is open to the Commissioners to undertake the work at any period when they find they have sufficient new quay space available to receive the traffic which would have to be removed.

Under the scheme projected the whole of the available space in front of the city of Montreal, embracing the shoal ground to the channel margin will be completely utilised for basins and wharfs. All the shore frontage, from the Lachine Canal entrance to Victoria Pier, will be reformed into wharfs and quays, and the large space of shallow ground below Point St. Charles will be appropriated for high level works. The high level works may stand over until the lower harbour is completed, or they can be proceeded with at any stage of progress, should a rapid development of traffic demand their establishment. Their construction will in no way interfere with the navigation, or with any of the existing or the other proposed works.

ACCOMMODATION PROVIDED BY GENERAL PLAN.

According to the report of the Engineer of the Commissioners, for the year 1876, the extent of wharfage in Montreal Harbour is 7,390 lineal yards, a total of 4.2 miles. The plan submitted would enable the Commissioners to increase the accommodation from time to time, as required, to an aggregate of fully ten miles of wharf frontage, nearly all available for deep sea vessels. At present only a limited portion of the wharf frontage can accommodate ships of heavy draught.

We scarcely feel called upon to establish the precise sections of the Harbour which hereafter shall be appropriated to the different branches of trade. Indeed so much depends on the character of the traffic to be developed in the future, as well as its possible fluctuations, that it would not be possible to define with exactness the extent of accommodation required in each case, or the best permanent arrangement that can be made with respect to the disposition of the several projected wharfs and basins. We may, however, point out generally certain parts of the Harbour which appear best adapted for special branches of trade. These we would suggest the Commissioners should provisionally establish, leaving the matter open for future re-adjustment when the wants of the community and the demands of traffic become better known.

Sea-going vessels could be accommodated at the branch jetties and basins extending from the main trunk wharf.

Coasting steamers, market vessels, and other craft engaged in the general city traffic would probably be most conveniently situated in berths along the shore under Commissioners' Street.

Fuel traffic, consisting of coal and wood. In a large city like Montreal there should be several convenient points appropriated for fuel required for local consumption, in order to reduce cartage and facilitate easy distribution.

There should be at least one fuel wharf in the lower part of the city near Hochelaga, another on the canal, and one or two others within convenient reach of the central part of the city front. Ample space for this purpose would be found at the end of the trunk wharf and at Windmill Basin. The quays inside the breakwater, as already stated, would be well adapted for coaling steamers and for discharging coal and iron requiring transport to the interior of the country.

Grain Stores would at present find suitable locations on the elevated ground near the sides of the Lachine Canal along Mill Street, and at Hochelaga. On the completion of the projected high level basin, the requisites necessary for grain houses and elevators on the most extensive scale may be secured.

The Lumber Business requires considerable space. It consists of two distinct branches—one for local consumption, the other for export trade. The retail or local business could not be better located than along the banks of the Lachine Canal and at Hochelaga, as at present. The latter place likewise seems well suited for the export trade; and when this branch of business demands an extension of wharf accommodation beyond that which is attainable at Hochelaga, ample space both for wharfage and storage convenient to deep water will be found at Ile Ronde, where convenient quays could be formed and a good harbour made, completely protected from the current.

It is proposed to keep the whole of the wharfs or quays of the lower harbour at the low level found most suitable for loading and discharging during the season of navigation. During the winter they will undoubtedly be submerged, and the accumulation of ice will render it difficult to maintain sheds or other erections on the piers, but to enclose and raise the level by lockage over this portion of the Harbour could not be effected without seriously interfering, if not stopping entirely the trade of the port for a considerable period. The disadvantages connected with the submergence of the wharfs in winter seems unavoidable. The lockage necessary in an elevated harbour would be still more inconvenient, and according to the evidence we have received would not give satisfaction to those engaged in the Montreal trade. Some branches of traffic would doubtless be best accommodated by an elevated basin, for this the projected high level works would make ample provision.

It is not at present proposed to interfere with the wharfage from Victoria Pier to Hochelaga. It is, however, proposed to fix a river line much upon the present line of wharfs, beyond which no jetties or wharfs should be allowed to project into the river. This line would extend as far down as Longueuil Ferry; but from Longueuil Ferry to Hochelaga Bay a considerable amount of ground might be impounded for docks when these come to be required.

APPROACHES TO THE HIGH LEVEL WORKS.

The want of proper access from the town to the high level works would prove a great inconvenience and drawback, and seriously retard the development of manu-

facturing industries of various kinds upon any part of the space between the breakwater and the Lachine Canal. The drawbridges over the canal are quite insufficient for the limited traffic which at present exists, and they will be found utterly inadequate when other works are added to those now existing.

It is hardly within our province to lay down any scheme for proper access through the town, as this will be a matter requiring the co-operation of the municipality and the authorities controlling the canal; we would suggest, however, that the attention of all parties concerned should be drawn to this matter, and provision made for convenient thoroughfares, with either bridges or subways at the canal crossings. In the case of bridges, it would be desirable to have them in pairs, so that while ships are passing only one need be opened at a time. In the case of subways, if circumstances would admit their construction, they would have the advantage of being constantly open for traffic.

We may venture to direct attention to the two leading routes, both of which are required; the one leading to the upper end of the works, and the other to the lower end:—

First—Via Wellington and St. Etienne Streets, by forming a proper access into the upper Harbour at the southern end of the high level works.—The question of subways refers more particularly to this line of route, one of which would be required under the canal, and should this be found practicable, it would entirely obviate the inconvenience to traffic arising from moveable bridges.

Second—From Common Street, near the Harbour Commissioners' Offices, across the entrance of the Lachine

Canal and Windmill Basin, leading by a wide street or viaduct to the northern end of the several basins.—This route would be very direct, but would entail the construction of bridges over the water channels mentioned. Looking to the future, however, the question of bridging may not be an insuperable obstacle. An inspection of the plans will show that the completion of the high level basins and the large twin locks in connection with them would establish a new and much improved entrance to the Lachine Canal. The old entrance would be relieved, and it might be arranged that all masted craft should pass through the new channel, while only barges and unmasted vessels should use the present locks. It may be assumed, therefore, that the Government will consent to the projected street and to fixed bridges over the canal so soon as the necessity for open bridges no longer exists. There would only remain the moveable bridge across Windmill Basin. Here the interruption would be comparatively little, and would be limited to the opening of the bridge when an occasional vessel passed to or from its berth in the basin. Throughout the winter months this bridge would also be a fixture, and no interruption to traffic would occur. This route would carry the main thoroughfares which converge in the neighbourhood of the Custom House onwards to the high level works, and would form a direct communication to them from the heart of the city.

CONCLUSION.

In projecting this scheme of improvements, we have given the whole subject brought before us our earnest

attention, and endeavoured faithfully to carry out the instructions set forth in the memorandum furnished us. In maturing our views we have necessarily considered different modes of accomplishing the objects aimed at, together with various details of construction. It is not necessary, however, at this time to enter into these matters; it would render the report exceedingly voluminous, and we are advised that the Commissioners would prefer simply our matured general scheme, their main object being to secure a well-considered plan to guide them in improving and extending the Harbour from time to time.

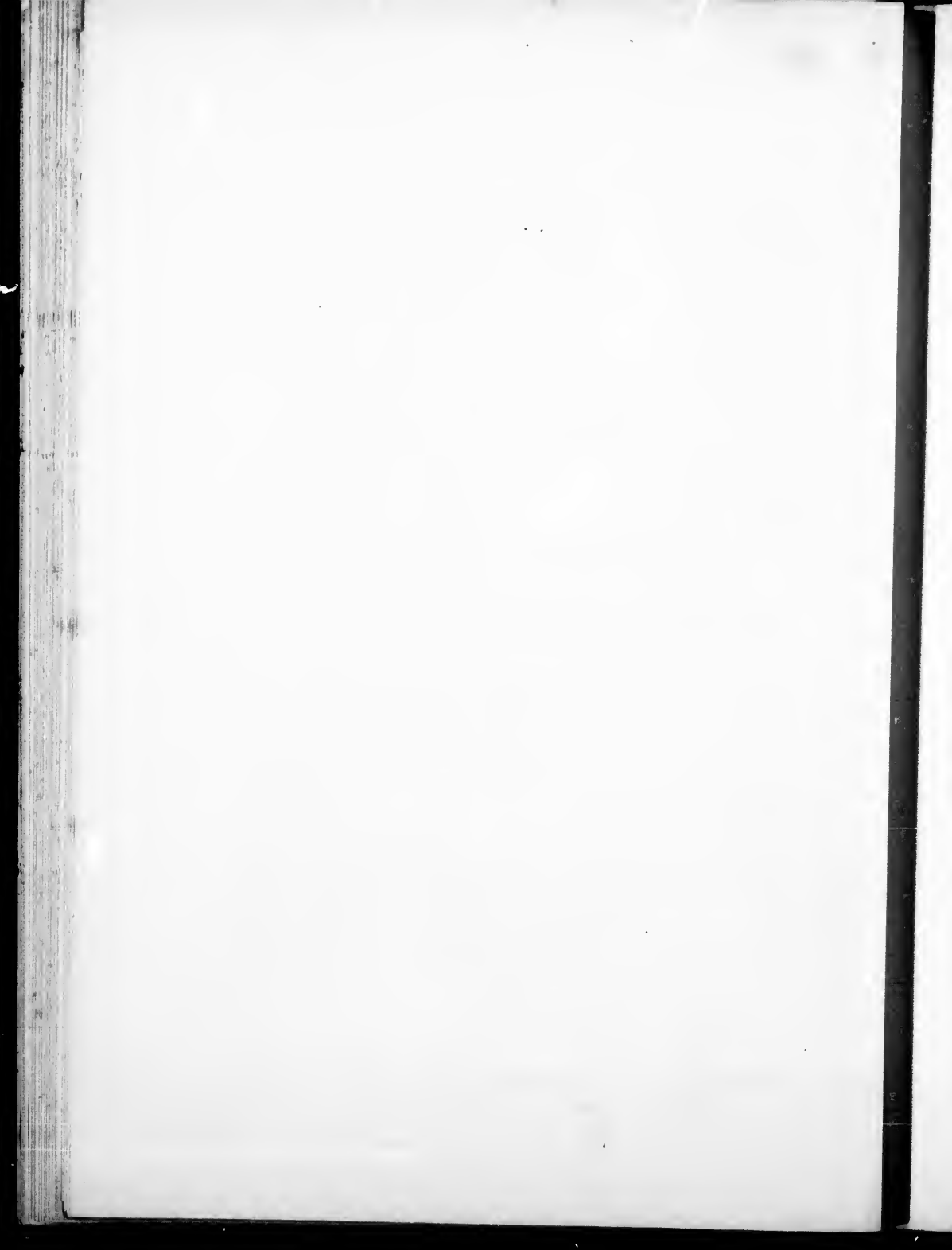
We therefore respectfully submit the scheme of improvements which we have mutually agreed upon to recommend for adoption, in the hope that it may subserve the purpose for which it is designed.

ROBT. BRUCE BELL.

JOHN NEWTON.

SANDFORD FLEMING.

December 26, 1877.



APPENDIX.

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APPENDIX

TO THE

REPORT OF THE COMMISSION OF ENGINEERS APPOINTED
TO PREPARE A SCHEME OF IMPROVEMENTS FOR THE
HARBOR OF MONTREAL.

COMMISSION OF ENGINEERS.

MR. ROBERT BRUCE BELL, M. Inst. C.E., Glasgow, Scotland, *Chairman*.
MAJOR-GEN. NEWTON, Corps of Engineers U.S.A., New York, U.S.
MR. SANDFORD FLEMING, C.M.G., M. Inst. C.E., F.G.S., Ottawa, Canada.

Proceedings of the Commission of Engineers.

The Engineers appointed, being duly convened, met the Harbour Commissioners on the 22nd September, 1875, and received from them the following instructions:—

HARBOR COMMISSIONERS' OFFICE,
Montreal, Sept. 18, 1875.

MEMORANDUM by the Harbor Commissioners of Montreal, for the Commission of Engineers:

The following resolution was adopted by the Harbor Commissioners, on the 5th May, 1875:—

“ That in view of the urgent necessity which has now arisen to deal at once with the important subject of Harbor improvements on a comprehensive scale. “ in order to meet the requirements of the enlarged channel to Quebec, and the “ future growth of the commerce of the Country, it is decided to refer the whole “ subject to a commission, consisting of three engineers of eminence for a final “ report thereon.”

The following statement is now submitted for your information and guidance:

The advantageous commercial position occupied by the City of Montreal, situated at the foot of the system of internal communications with the western country, tributary to the great lakes, has, for many years past, made its harbour accommodation and the improvement of the river below, questions of great public interest. In 1843, the Government of Canada commenced the deepening of the Channel between Montreal and Quebec, especially at Lake St. Peter, where at low water there was only 11 feet, and the navigation restricted to vessels of 350 tons burthen or less. From various causes, however, the work made little progress, till in the year 1851, an act was passed giving power to the Harbor Commissioners of Montreal to carry it on, and under their control a channel has been completed throughout, having not less than 20 feet depth at low water, and 300 feet width at bottom. The Commissioners have dredged and deepened the harbor to meet this improvement, but it has long been apparent that the commerce of the country would demand continued enlargement of this great channel to the sea, and that we must look forward to the provisions of much greater and more varied accommodation in our harbor for the trade we control, as well as that we desire to attract.

Much public discussion has occurred, and great differences of opinion are known to exist on this subject, which has been already examined by eminent engineers, among whom may be mentioned Messrs. C. S. Gzowski and T. C. Keefer, in 1851, Messrs. McAlpine, Child and Kirkwood, in 1857, and John Trautwine, Esq., of Philadelphia, in 1858; also by Mr. Sippell, Mr. Legge, and others, whose reports will be placed at your disposal.

The Commissioners would here draw your attention to the rapidly-increasing trade of this continent, especially of Western Canada and the Western United States. The rapidity of this increase in the last twenty-five years has made the then constructed canals in the United States and Canada utterly incompetent to meet the wants of even the present trade, hence their enlargement now, both in the United States and Canada, has become a necessity. In 1838, only 78 bushels of grain were shipped from Chicago and Lake Michigan; while in last year, from that lake alone, the exports of cereal (without taking in provisions), were 123,000,000 bushels. In 1846 the value of the imports and exports to and from Montreal was \$10,099,180, while last year they amounted to \$65,808,448.

In 1854, the tonnage, arriving at the Port of Montreal from sea, was 72,305, while last year it amounted to 423,423 tons. In 1861, the tonnage coming into the port of Montreal locally, but not from sea, was 532,224, while last year it was 956,837. The revenues of the port from harbor dues, in 1854, were \$64,000, while last year they were \$280,021, collected. These facts are mentioned to show the increase in the past, and there is no reason to believe that the increase in the

next twenty-five years will not be in proportion, especially when it is considered that the north-western territory of British America, on the Saskatchewan and other rivers, is equal in extent to the whole of the United States east of the Mississippi River, and nearly all fit for settlement. The St. Lawrence is also the natural outlet for the western and south-western United States, and the Port of Montreal is 120 miles nearer to ports on the upper lakes, than any of the sea ports on this continent. The distance from Chicago or from any other lake port to Liverpool is 480 miles less *via* Montreal than *via* the Port of New York; and when the proposed railway is completed from Montreal through the valley of the Ottawa, and a bridge erected at Sault Ste. Marie, at the outlet of Lake Superior, Minnesota, Wisconsin, and other northern states, will be connected with Montreal as a sea port 500 miles less distant than with any other sea port on the Atlantic. To these facts the commissioners would direct your attention, as they seem to warrant the most liberal expenditure for creating facilities at this natural point of transhipment.

Having briefly referred to the history and statistical position of the question, it now remains to deal with existing circumstances and the causes which at the present time have induced the Commissioners to ask your advice.

By an Act of the Canadian Parliament, passed in 1873, the Commissioners are empowered to continue the deepening of the navigable channel between Montreal and Quebec, and they have since entered vigorously upon the work. Their purpose completing a channel of twenty-two feet within three years, and there can be no doubt that within reasonable limits the work of improvement will be continuous, as provision must be made for the largest class of vessels employed in general commerce.

Up to the present time our harbour works have been carried forward without any harmony of design, but the necessity of some comprehensive plan is now fully realized by the Commissioners and the public.

Such a plan it is now desired to prepare and adopt. The following considerations respecting it are placed before you :—

1st. The Commissioners desire to make the utmost use of the space occupied by the existing harbour works in front of the city, upon which a very large expenditure has been made, and where the principal trade is already located.

2nd. The plan should be, if possible, progressive, so that it can be taken up by sections, be capable of easy extension, and rapidly available for use and revenue.

3rd. The occupation of the Harbour may be thus described :—

(1st.) Ocean steam traffic, requiring permanent locations in the most convenient positions to the city, for the distribution of general cargo.

(2nd.) Large clipper ships, engaged in the same trade.

(3rd.) River craft, of light draught, but requiring favorable locations for passengers and miscellaneous traffic.

(4th.) River craft with city supplies of less value,—wood, hay, &c.

(5th.) Ocean vessels with coal, rails, &c., for city use and transport westward.

(6th.) The lumber trade, requiring large wharf surface, as well as accommodation for easy transfer from light craft to larger vessels. This business can be located at any point within reasonable distance.

(7th.) The Grand Trunk Railway has already tracks laid along the harbour frontage, and two other lines of railway desire access to the wharves. The question of railway connection must, therefore, be considered, as well as the increasing demand for wharf space in cartage traffic, all which point to wide thoroughfares along the whole front of the city as soon as practicable, and in this connection it should be borne in mind, that an accommodation secured on the north side of the harbour is greatly more valuable than any to be obtained on the south side.

(8th.) The transfer of all the great inland traffic, to be exported by sea, is effected here, and requires free movement from the mouth of the canal to all parts of the harbour.

The rapidity of the current and rising of the river, upon the close of navigation, covering our entire works with ice and water to the depth of many feet, are among the natural disadvantages that will engage your attention. Any scheme that would secure a high level harbour for a portion of our trade, and a graving dock for repairs, would be looked upon with great favor as providing for a difficulty acknowledged by all, but hitherto in no way attempted to be overcome.

In conclusion, the Commissioners draw your attention to the fact that the whole system of Canals above Montreal is now undergoing enlargement, while extensive railway projects are determined upon, connecting this point more completely and advantageously with the Great West. In their opinion the future progress of Montreal will be very rapid, and the trade of the St. Lawrence attain dimensions which it will tax our utmost capacity to accommodate, while this condition of affairs may be expected to come upon us so quickly that the time of action has now come and our preparations can be no longer prudently deferred.

The Commissioners offer no opinion upon any of the schemes for Harbour improvement already proposed. They desire to leave you at full liberty to investigate the whole subject, and to obtain information from every available

source. In this they will render you every assistance in their and power, they invite the co-operation of all interested in the question to the same end. Mr. Kennedy, Chief Engineer to the Trust, has an extensive knowledge of the Harbour and the localities around it, and he has been instructed by the Commissioners to aid you in every way towards the prosecution of your important work.

The Board then met, and appointed Mr. ROBERT BRUCE BELL Chairman, and Mr. WILLIAM T. OLIVE Secretary, and gave notice, by advertisement, inviting parties having information or suggestions to submit their views, either in writing or verbally, and thereafter met in the Harbour Commissioners' Office, on October 6th, at Twelve o'clock, when the following parties gave testimony:—

MR. HENSHAW, Member of Council, Board of Trade, representing the Coal Trade.

Up to within a very few years past, the coal trade of our port was comparatively of very insignificant proportions; but year by year it has been extended until now it has reached almost gigantic figures, from the fact that the forests, within a radius of 200 miles of Montreal, having been depleted of wood, and the various Railway Companies having to look to the coal supply for means of locomotion. The presumption is that from 200,000 tons, it will probably reach, within a very short time, at least three-quarters of a million tons per annum. Up to the present time, scarcely any accommodation for this great trade has been supplied. We find the wharves, to a very large extent, encumbered by lumber, which necessarily occupies a very large amount of room. This coal trade will have to be accommodated somewhere; but, of course, it is not my business to point out any particular locality; yet it seems to me the extension of the new wharf at Wind Mill Point, or somewhere in that direction, is the spot—provided, of course, it is sufficiently large, and if the lumber trade is removed to some other place where there is more room. At the present time, the accommodation is inadequate for the trade, and you can easily see that the inconvenience becomes greater from year to year.

[A map of the harbour was produced, at the suggestion of the Chairman.]

MR. HENSHAW continued.—I understand there is to be very much larger accommodation here (Windmill Point Wharf); yet, notwithstanding its very limited space at present, a large amount of coal has been landed this year upon that wharf, perhaps 50,000 tons, but owing to the public works going on, its almost immediate removal was imperative, and the process of doing so by carts was not only slow but

expensive. On Commissioners Wharf there has been over 60,000 tons deposited. Windmill Point has been almost exclusively devoted to coal, but this appears to be the only point devoted to it at present, and it is wholly inadequate, so far as room goes. All down here (pointing to the map) the lumber encumbers the wharves, say from the Bonsecours Market to the east end of the Commissioners Wharf. If the lumber trade could be removed to some point below the western extremity of Commissioners Wharf, it would afford relief.

Q. I understand you would like the whole of the lumber trade removed from Commissioners Wharf?

A. Yes, to some place below.

Q. And also from the east?

A. To have no lumber trade between Windmill Point and some point below Commissioners Wharf.

Q. In fact, to have the lumber trade excluded from that district?

A. Yes.

MR. HENSHAW continued—The simple object I had in view in coming here was to state the inadequacy of the present facilities, not to suggest harbour improvements.

Q. Can you tell us what accommodation you have at present; what front of wharfage you have?

A. I could not say; I don't know what the frontage of the Commissioners wharf is.

Q. You have referred to the quantity of coal discharged on Commissioners wharf?

A. It is discharged at various places. The Commissioners wharf is not wholly occupied with the discharge of coal. A dozen or so of cargoes of railway iron and pig iron are discharged there. It would accommodate a large amount of coal if it was used exclusively for that purpose.

Q. How much, in your opinion, do you consider is necessary, in addition to what you have now. Tell us what accommodation you have now, and what you ought to have?

A. If we had Commissioners wharf entirely with Wind-mill Point, we should have enough.

Q. How many places intermediate?

A. Oh! none unless for an occasional cargo.

Q. Wind-mill Point is about 1,800 feet; can you give an impression what will accommodate the trade for a few years; how many feet of frontage? I will put it in another form. Ground has been assigned to different parties in connection with the coal trade; for instance, 150 or 200 feet frontage; can you tell us how much coal will pass over 200 feet of wharf frontage. Suppose you had 200 feet, how much coal business could you do upon that frontage?

A. That is a difficult question, which I could not answer without some consideration.

Q. From your experience?

A. I have had this experience in the confined space on Commissioners Wharf; we have had six or eight thousand tons at a time and then we have had to move to this point at immense delay and additional expense in cartage; the only two places where we can discharge are Commissioners Wharf and Wind Mill Point.

Q. Do you know the particular condition of the wharf?

A. For the accommodation of the Grand Trunk Railway they were allowed to erect dumps, and there we dump the coal and the cars carry it off.

Q. You were allowed three or four hundred feet?

A. Yes.

Q. Besides Wind Mill Point?

A. Besides Wind Mill Point.

Q. Was that all you had, except Wind Mill Point?

A. That is all we had.

Q. Was that for the whole of the coal trade?

A. No, a large amount of coal was unloaded at other wharves and discharged into carts; we can discharge our vessels in half the time by dumping the coal on a place set apart for it.

Q. What we want to know is the accommodation you now have, and what you think you ought to have to accommodate the trade at the present time?

A. There is no actual accommodation set aside for us; we go in and take chance. If there is not room to get in to unload, we have to move to another part of the harbour.

Q. What is the length of wharfage on Wind Mill Point?

A. Two ships' lengths here and three ships' lengths on the south side—about 600 feet.

Q. Then you have about 1,000 feet altogether?

A. Yes.

Q. And what depth?

A. The depth cannot be over 200 feet at Commissioners' Wharf; it is very much less at Windmill Point. We just put coal on the wharf through sufferance; the Harbour Master or Government Engineer may order it to be moved at any time.

Q. Do you say the lumber should be moved from here (place indicated) to Windmill Point?

A. No, sir; down here. I hazard the suggestion, without encroaching on any plans, that if a wharf was constructed from some point near the Grand Trunk Railway bridge down over the shoals immediately opposite here, thus enabling the Grand Trunk to go down with their cars—the quantity they will probably receive, 200,000 tons—it will relieve these wharves of an enormous quantity. There cars would go

down without interfering with other wharves—say from some point along down here—from the shoal opposite the town.

Q. Does the Grand Trunk Railway take much away from Montreal?

A. Yes; the Grand Trunk Railway have taken away 60,000 tons themselves. The city requires about 150,000 tons.

Q. Then about 1,000 feet of accommodation is sufficient for 200,000 tons of coal?

A. That is to have it removed as fast as possible.

Q. Where does all that coal go?

A. It is for the town. The coal for the Grand Trunk on Commissioners Wharf is carried to Brockville, etc., westward.

Q. The Grand Trunk Railway takes it from Commissioners Wharf?

A. They take it from there for points in Upper Canada.

Q. Is there a depot for coal merchants in that direction?—where do they cart it to?

A. They distribute it to different parts of the town.

Q. If you had uninterrupted use of 1,000 feet, would it be sufficient for trade at the present day?

A. With Wind Mill Point.

Q. Would that be sufficient or would you require more?

A. Require that, and some room here at Wind Mill Point.

Q. Could you reduce it to space or frontage?

A. If we had 1,500 feet frontage I think it would be about sufficient.

Q. That would accommodate the present coal trade. Would it be any advantage to have that frontage on a level with the Lachine Canal or any part of it?

A. It would decidedly, because coal is brought here and discharged from ships into barges for Ottawa. I brought my ships up here, barges came through the canal and the ships discharged.

Q. What tonnage?

A. I have had this year ships drawing 18 feet 6.

Q. Many of that draft?

A. Oh yes; a good many. There are very few sea-going vessels coming here drawing less than 18 feet.

Q. Would it be a great convenience to have the means of raising these ships to the upper level?

A. Oh, no. You mean raising in the lock?

Q. Yes, sir?

A. I don't think there would be any good in that; the barges come down the canal.

Q. That is another question. Will it afford accommodation to the trade to have storage room on a level with the canal?

A. It would be accommodation, but I have never thought of that myself.

Q. The object of it would be to save handling ?

A. There would be no handling when discharged into barges. The barge comes alongside the sea going ship and the ship discharges into it.

Q. For the use of Montreal would it be any advantage ?

A. I think not ; there would be no advantage so far as I can see.

Q. Will these basins that the canal people are making just now, give any accommodation to your trade ; I understand they are making locks 217 feet long, 19 feet on sill ?

A. Of course, that would be great accommodation.

Q. You see, we want to know what these basins are for ; what trade they will be occupied by ; I presume when making such a basin for the canal, they intended it for ocean vessels of 18 feet draught, that would go up and discharge into barges to go up the canal ?

A. That, no doubt, will be of great service ; I was not aware until this moment that the entrance into the canal was to be 18 feet ; of course that would be a very great improvement to the coal trade.

Q. These locks are not being made for the purpose of locking vessels up the canal, but to take them into the basins to discharge into vessels that go into the canal ; so if that was the case, would not your trade be accommodated as far as what goes up the canal ?

A. It would not, because they could be discharged here in the harbour anywhere at less expense ; but, if the Grand Trunk Railway had a line run there, and their coals deposited in that direction, it would be more economical, perhaps, for the vessels to go up ; but, as far as discharging into barges to go up the country, it could be just as well done in the harbour as anywhere.

Q. They have now a certain draught ; the greatest is limited by the accommodation of the harbour. Would it be more profitable to employ larger vessels than are now employed ?

A. I think not, because a vessel carrying 1,500 tons, is quite as large as there is any necessity for, because coal becomes deteriorated in value and appearance in these great cargoes ; smaller cargoes turn out in better condition.

Q. Then you don't require vessels of more than 18 feet draught.

A. No, sir. About that, or 18 feet 6 inches.

Q. Could you show us any official document showing the size of vessels coming into the harbour ?

A. I can do so.

[From the opening of navigation this year to the first week of October, there was a total of 123 vessels, steam and sail, entered at this port with coals ; these vessels ranged in draught of water from 22 feet down to 16 feet. Of this number 85 were from our Lower Port coal mines, and 38 were from Ports in Great Britain. I have not taken account of small craft carrying coals from Pictou to Montreal, the aggre-

gate of which, however, is very considerable in tonnage. I believe that I am quite within bounds when I say that as many as 20 coal vessels have been in port and discharging at one time, and had to be accommodated at the wharves all the way along from Wind Mill point to Commissioners wharf. I have said that vessels drawing 22 feet have entered our harbour, but this could only be done during a very short period in early Spring; but the great bulk of business in shipping is during the low summer level of the river. In May, June and July, 14 English coal ships arrived, while in August and September, 24 entered port.]

Q. I would like to enquire into the possible increase of trade, &c. Can you form any estimate as to the percentage of increase. In course of ten years will it be doubled, or what?

A. I think in the next ten years, the receipts of coal will be three quarters of a million tons. It is becoming larger every year.

Q. In ten years from now, it will be four times the present quantity?

A. Four times the present, I have no doubt.

Q. What is the present supply?

A. 400,000 tons. I am not taking into account American coal. American coal comes in here through the canals.

Q. Should not that be taken into account?

A. Probably. It comes in barges of 150 tons. They can run anywhere; their draught is only three or four feet.

Q. Is that trade liable to increase?

A. I don't think it is so liable to increase as the other—the other being so much cheaper; still there will also be a large trade done in American Anthracite coal.

Q. I would like to draw Mr. Henshaw's attention to this point. You think you require 1,500 feet frontage and a depth of 200 feet to accommodate the present trade fairly?

A. Fairly, yes.

Q. In ten years, then, it would necessitate 6,000 feet for coal alone?

A. Not necessarily; facilities might be provided for removing most of the coal. Now, for instance, as I suggest—suppose the Grand Trunk put a track down here, and a wharf built on that shoal, opposite here, that would relieve the city entirely of some 100,000 tons that would not touch the wharves at all.

Q. It is a question of accommodation that concerns us chiefly. Would it require in ten years double?

A. Yes.

Q. 3,000 feet wharfage?

A. Yes.

Q. You think 3,000 feet would accommodate the coal trade for ten years? You say the G.T.R. take the largest quantity?

A. Not the largest; they take a great quantity.

Q. Do you suppose the quantity taken by the Railway will increase ?

A. Decidedly.

Q. How many tons do they take now ?

A. The Grand Trunk Railway, between Upper and Lower Canada, take 125,000 tons.

Q. That is a great proportion of the present supply ?

A. A great deal of that used in Western Canada comes from Ohio and Pennsylvania by railway.

Q. I mean of the coal from Montreal ?

A. Well, they take 60,000 tons.

Q. When the demand increases, you think they will take four times 60,000 ?

A. They will take twice, at any rate.

Q. Where does the remainder of the coal go ?

A. To the manufacturers ; some consume 14,000 tons a year, some 10,000 ; the local consumption of the city must amount to 70,000 or 80,000.

Q. Then the rest is distributed from the city to other points ?

A. Yes.

Q. By canal and railroad ?

A. Yes, and by carts.

Q. Distributed in the city by carts ?

A. Yes.

Q. Can you give me any idea of what the trade will be say twenty years hence ; do you think it will increase much over 800,000 tons ?

A. Well, if we go on increasing in the future as in the past I should not be at all surprised. There is no limit in reason for increasing it if our forests become depleted. They have in many localities fairly become depleted in the twenty years past, and it becomes necessary to provide some scheme for the future supply.

Q. You have no idea that it will double in the next ten years between the tenth and twentieth year ?

A. Very probably it may. I should hardly like to hazard an opinion about that, but judging from the past, it is very likely to.

Q. There is no way by which you can double the trade on the same frontage ?

A. If we had facilities for removing you may. For instance, if I take a contract for 30,000 or 40,000 tons of coal, as I have done already, I have to look out for tonnage. I might have ten or twenty ships in at the same time. If I could get them in as I wanted them, one ship at a time, it would be different, but when I have a large number in at once there is demurrage, so that I have to discharge somewhere. No very large quantity is going forward in barges ; it is chiefly for local consumption. But the trade is gradually growing. For instance, four years ago the Grand Trunk used all wood. They cannot get it now. They use it at Richmond and Island Pond. They use it there, but it will be cut off in a short time, and then they will

have to take coal. There is every reason to believe there will be a large increase of coal from year to year.

Q. If that is the case, it may be sent to different depots by canal ?

A. It will all have to go by railway to the inland market. Point Levi is the only depot on the river.

Q. What part of the G. T. R. is supplied from Montreal ?

A. From Point Levi down they will probably use wood for years to come, but from Point Levi to Portland, and Point Levi to Sarnia, coal.

Q. What portions of the Grand Trunk Railway will find it best to draw from Montreal ?

A. All those districts this side of Kingston. These are my opinions. Of course I have never consulted the authorities of the Grand Trunk Railway, and you might find if you speak with Mr. Hickson his views would perhaps be quite different to mine.

Q. But what part would Montreal supply with coals ?

A. From Montreal they would supply coal to Island Pond, and West as far as Kingston. If they had a depot at Point Levi to discharge coals it would be to their interest to go there to supply that district.

Q. In order to accommodate the future coal trade of Montreal, can you form any idea what should be provided for the coal trade ?

A. I should say for the next ten years give us a frontage of 1,500 feet and we could get along with it.

Q. You said 3,000 feet in ten years. In 20 or 25 years would it be sufficient ?

A. I doubt it, unless, as I said before, facilities were given for taking it away from the wharf.

Q. Do you think 4,000 feet would be a liberal provision ?

A. I think 4,000 feet would be a liberal provision.

MR. WINN, representing the Iron Trade.

Had been an importer for a great number of years, and during that period watched carefully the interests of the importers of goods. It was only in that capacity that he had any right to speak. A few years ago, when the question of laying rails on the wharf was considered, Mr. Brydges endeavoured to make out the best case he could, and put it down in figures, and from them it was shown that the quantity of goods that went westward by rail, ex-ships, was four per cent., and 96 per cent. went into the merchants' store-houses or to forwarders at canal; it might be assumed from this, that of all goods imported in all times, three-fourths will have

to be got into either merchants' "cores, or to barges for transshipment ; he thought that could be laid down as a preliminary principle ; it was well known that the interest on monies expended must be met by harbour dues ; if so large sums of money were to be expended, as involved much increase in harbour dues, the loss of trade consequent thereon would take away all benefit ; next, he thought the improvements should be made gradually in keeping with the existing revenue ; the existing revenue should provide the interest on the money expended ; the question of cartage was one which should be taken note of ; it was found by experience that when all goods received, the after cost of cartage must be considered, and to meet this was indispensably necessary that all vessels engaged in the import trade should be within reasonable distance from the centre of the city ; this business centre was without doubt in the vicinity of the Custom House ; he laid it down that all experience had shown, and he had noticed it from his own long experience, that any important harbor improvement to be beneficial to the city must be so made that importing vessels bringing out general cargoes, which included three-fourths of the vessels arriving here, must be discharged within 2,000 feet of the Custom House ; he held that all vessels bringing general cargoes must be discharged within 2,000 feet of the Custom House, or in case of a press of business, within 3,000 feet, which space could accommodate the greatest press they were ever likely to see ; the distance between Bonsecour Church and Princes street was where the accommodation for importing trade is needed, and there it ought to be, and at most should be within 3,000 feet of Custom House, and so distant only in case of a press of vessels ; it was of most vital importance to the city that such should be the location of the improvements. Mr. Winn next referred to the shoal in the river where they were told it was a bed of rocks and could not be removed ; they had been told the same, with reference to the foundation of the Victoria Bridge ; they were told it was to rest on a bed of rocks, but the contractors found the supposed rocks to be mere boulders, and they removed them ; they had been told formerly that rocks forbade deepening basins below St. Sulpice Street, but these also had been easily removed ; hence, he thought they would have little difficulty in removing a large portion of that shoal so as to allow of piers being extended ; of course, the exact mode rested with the Commissioners ; a frontage of 2,000 feet could, by means of piers, be made to afford accommodation for the importation of general cargoes, and 3,000 feet amply sufficient for a press of vessels ; they had seen as many as 90 vessels here at a time ; thought that was the largest number that had ever been here ; and he thought if accommodation to the extent he had indicated was provided, it would meet the wants of the trade for many years to come, and be a benefit by having the whole compact within half-a-mile ; the necessity for this cannot be over-estimated. Mr. Winn next remarked that vessels bringing out general cargoes, usually included pig iron and other heavy goods, which, if they could be unloaded at one side of the pier, and loaded into barges at the other would be a matter of

great importance to the trade, especially to the iron trade, which was at present his chief business; and the means of unloading in such a way was of great advantage, for, instead of paying 60 or 70 cents a ton cartage, it could thereby be done for 6 or 7 cents; as regards lumber and coal, he was of opinion they should be at more distant points; the lumber trade should be at the foot of the current; wharves at over 3,000 feet from Customs, were useless for general trade. Mr. Winn related a conversation with Mr. Nish some years ago, who spoke of the then new wharves near the Military Hospital; when he told that gentleman that, as to discharging goods away down there it would be cheaper for him to have his goods unloaded at Quebec and sent up, than to be compelled to have them unloaded at the Military Basin; the Military Basin was about 4,000 feet from the Custom House, and to unload there involved much labour, loss of time, and increase in expense; on one occasion when he had one cargo unloading at Mill Street Wharf, and another at Military Basin, his man had to hire a horse to ride between the two, in order to properly superintend the unloading; unless the vessels can be brought within three thousand feet of the Custom House, no improvement would be of any service to the trade at all, and if possible, all wharves should be within 2,000 feet of the Custom House, and the coal and lumber trade should be sent elsewhere; this was also apparent from the danger of fire; he considered that Hochelaga and Isle Ronde were the very places for the lumber trade, with the improvements that the Canal Commissioners would make there; he thought that it was perfectly clear that, in all time to come, vessels would be at every size, from 200 tons upwards to 4,000 tons; and for the accommodation of these with the piers extended, if half the wharves have 20 feet, and half 25 feet of water, it would be amply sufficient; he looked upon that the main question was the centering of the import trade within the distance he had mentioned, 2,000 feet, or for press of vessels, 3,000 feet from the Custom House.

Q. Your view is, there should be no accommodation except by improvements on the river front, and in deep water?

A. Yes, sir. If it is possible to remove that shoal—if that can be done—there is ample accommodation on the river front. The main point is, if you have 2,000 feet available space, or 3,000 feet for a press.

Q. What class of vessels would this accommodate?

A. Ships from 200 tons upwards, needing almost about 20 feet water, and allowing 25 feet of water for large steamers.

Q. That is your idea to have that (the shoal) removed to make more room for approach to the piers?

A. Yes, sir.

Q. I think I gather as your opinion, that provision should be made for all the trade of the city, except the coal and lumber trade, within about half a mile of the Custom House?

A. Yes, sir.

Q. Is there, in your opinion, sufficient accommodation at the present moment for the present trade, or should it be extended?

A. At the present time, there is not sufficient.

Q. What additional wharfage would accommodate the trade?

A. Twenty per cent. more than there is between these two limits.

Q. Question was asked whether Mr. Winn thought there was not necessity for storage on the wharf?

A. I think it is necessary to have sheds for steamships.

Q. Sheds?

A. Only sheds.

Q. Would you think it desirable to have permanent sheds?—would you think it advisable if it could be done?

A. I think it would obstruct the traffic.

Q. How is the grain stored at present?

A. At present on the banks of the canals.

Q. In granaries?

A. Yes, sir.

Q. There is 11,300 feet at present; you think it should be increased 20 per cent.?

A. Yes, sir.

Q. That would make it 13,500 feet; that you think should be provided for the present?

A. I say 20 per cent. each year.

Q. Then that would come to a great deal in twenty years?

A. The best scheme is that which gives increased accommodation as the trade increases. If trade were bad and money scarce, harbour improvement could at such times pause until need of extension again arose.

Q. Can you form some idea how much additional frontage you will require ten years hence?

A. It is scarcely likely trade will double itself in ten years; it would be the best scheme to provide increased accommodation as trade increases each year.

Q. It will be a difficult matter to make provision for the future? You said the increase required was about 20 per cent. per annum; that is, 200 per cent. in ten years?

A. I reserve the option of pausing as trade stops. I cannot say whether it will or will not. It may increase to any extent, and that depends considerably upon prudence in expenditure. If we cannot send goods to Chicago cheaper than New York can, we close the trade entirely. I don't think any of us will live to see the trade of Montreal doubled in less than ten years.

Q. Do you think it safe to calculate an increase of 50 per cent. in ten years?

A. Yes, sir

Q. You hope it will double; but it is best not to be too sanguine

A. Yes, sir.

Q. Then the quayage in ten years should be about 20,000 feet?

A. Yes, sir.

Q. Look still further—20 or 25 years hence; would you leave provision of 25,000 feet? Would that be enough?

Mr. Winn replied that he believed the work of improvement should go on gradually, without much expense, in order to enable the trade to supply the Western market. Unless they could carry on the trade cheaper than New York, Montreal would lose the trade.

Q. You speak of the import trade?

A. Yes, sir. The export trade is out of my line.

Q. This does not include the grain trade.

Mr. Winn replied that vessels bringing out goods, loaded grain while part of inward cargo was yet on board, and used the elevators at one end, whilst they unloaded at the other. The system was to load the grain whilst they unloaded the goods.

Q. The present provision being 11,300 feet, about double that would meet the requirements of the trade of Montreal in ten years?

A. As far as we can tell.

Q. Not including coal and lumber?

A. Excluding them. I think space in the centre of the city too precious to be taken up by coal and lumber.

Mr. McLennan said that the Secretary of the Board of Trade would furnish figures which would show the fluctuations of trade in the past, which were worth consideration. That trade had rapidly increased to a maximum, and then dropped down to below the former figure. Upon each decade, however, an increase was shown on the previous decline. We have in the past gone through that process, and it is no matter whether we speak in relation to the trade of this year, which is the smallest trade, or two years ago, which was the highest. We may double the trade of this year in a few years, but not the trade of 1873 and 1874 for a long time.

Q. Then in each decade you must take the average?

A. Yes, sir.

Mr. Winn.—The falling off of trade this year is not likely to occur again.

General Newton.—In New York and Brooklyn I have seen vessels unloaded; there they have store houses—the whole pier is a store house; I have seen ships with a general cargo discharged into the store house, and whilst they were discharging they have been loading with grain. Now in this case—in Montreal you cannot have permanent store houses or wharves on account of ice shoves; therefore everything has got to be carted to the stores at an additional expense?

Mr. Winn stated that if the goods were going to Upper Canada the goods were

unshipped, and if it belonged to local merchants it had to be carted to the ware house.

General Newton asked, if it were possible to erect warehouses where goods could be stored previous to transshipping by railways or removal to stores, would it not be convenient to the trade to have such store houses?

Mr. Winn said one or two such stores might be convenient but having too many would not be convenient. The steamships had sheds, but probably they would like them because they would be more substantial. With the trade with transient ships it was different. The goods must be delivered and the captain settled with whilst in port.

Q. So that a store house in that case would be no good at all?

A. No, sir; not at all.

Q. Stores would be valuable for regular lines?

A. Yes, sir. I suppose a permanent store would be better protection against fire and thieves.

Q. Will benefit result from the basins made up the canal?

A. Yes, for general trade. These basins have been made by Government without sufficient consultation with the trade or Harbour Commissioners. They will do some good—relieve some trades, but how much it is hard to say. They are making magnificent basins.

MR. WILLIAM DARLING representing the Hardware Trade.

Mr. Winn had stated what was required, if the business part of the city is to continue where it now is, and the desire of importers, owners of property, and others doing business in the present business part of the city, is, that increased harbour accommodation be provided at the nearest point—the expense to the importer on goods that have been carted a long distance is considerably increased, and this especially applies to the goods Mr. Winn deals in, such as pig iron, which, if landed at a distant wharf, might amount to as much as if it had been placed in barges at Quebec and landed by them at a more convenient wharf in the harbour of Montreal. Warehouses would be convenient if they were the property of the Harbor Commissioners or shipping companies, and no storage was charged for 8 days after landing. If a charge was made for storage as soon as the goods enter the Warehouse they may as well be taken to the Warehouses now in the city, the difference in the rate of cartage to a Warehouse nearer the wharf, than the Warehouses now in the city for storage, would not be much on general goods.

The Harbour Commissioners have recognised the claims of high class vessels

carrying the best description of cargoes, and have placed Ocean Steam Ships and Clipper Ships as the vessels entitled to best berths. There must be in the future a great increase in the carrying trade of the port of Montreal.

Q. Do you consider the present height of the wharves a good level for vessels to discharge from, or are they flooded ?

A. They have been flooded in the Spring, but that was previous to the time the wharves were raised. I do not think they have been flooded since that time ; some of them are now I believe one foot higher than others.

Mr. Fleming—I asked Mr. Winn some questions regarding the present and future requirements. The first question was answered, that the present accommodation in the harbour should be increased about 20 per cent, making 13,500 feet. Do you coincide with this view ?

A. The wharfage required for the trade of Montreal is different from that required for goods not intended for Montreal, and which may be carried away by steamers or barges from the sea-going vessels, and therefore I think that the best use should be made of the wharves in front of the city, and that the wharfage should be increased as much as possible within the limits stated by Mr. Winn for the distribution of goods in the city. With regard to the increase of the whole business of the harbour it applies to goods for distant points landed at Montreal and conveyed from thence by other vessels or by rail, and in such case it is not of much consequence where the sea-going vessel discharges if the steamer or barge can get alongside to receive the cargo, or if the rail and cars are near the place where the sea-going vessel is discharging.

Q. Is the whole of the frontage of Bonsecours Market employed in the trade you speak of ?

A. Yes, sir.

Q. Do you think it should be extended for the trade of Montreal in the present day ? I dont mean this year or last year ?

A. I think the improvement and extension should be made within the space I have mentioned, and which has been more fully described by Mr. Winn, for the receipt and distribution of goods for Montreal.

Q. What I want to get at, is the estimate of the men in the trade as to the further requirements of Montreal. Is it for the trade you talk about, the delivery of general cargoes for Montreal, that the wharfage is insufficient ; for the present hour Mr. Winn says an increase of 20 per cent. will meet present wants. Do you think that is sufficient ?

A. I think it is enough at present.

Q. Can you form any idea of what might be required—not positively but what in full probability would be required 10 years hence ?

A. That depends on the means provided for carrying goods from the harbour by rail from more distant points of the harbour.

Q. Then you think that some provision should be made for those branches of commerce to be accommodated within half-a-mile of the Custom House, and others at an outside point, that an increase of 13 or 14,000 feet would serve for a long time to come?

A. I think so.

Q. Do you think the trade you are engaged in will double in ten years?

A. I do not think the Montreal trade in hardware will double in ten years, but I think that ample space should be given to a vessel with general cargo to discharge and arrange the cargo by the different marks on the wharf, so that they can be easily and quickly removed. The want of space now, on some wharves, leads to great confusion.

Q. How long may goods be kept on the wharf?

A. It is expected that goods be removed as soon as landed, and the ship desires to be relieved from responsibility as soon as landed, but there are constant disputes as to the liability of the ship after the goods are landed, and the want of space to arrange the goods increases the difficulties in getting delivery.

Q. What you want is, that the goods be arranged and kept together until you can take delivery of them and not to have to take delivery of one package at a time?

A. The receiving of the goods need not to be delayed until the whole consignment is landed and arranged, but if there was space on the wharf to arrange the cargo as landed, the present confusion of carters searching among packages placed upon the wharf, without arrangement for want of space, would be avoided.

Q. Has the trade of the country doubled in ten years?

A. I think it has.

Q. Might it not double in ten years more?

A. I think it may.

Q. The question was referred to by Mr. Winn, and you alluded to it, with regard to cost of carting goods from distant points if it be not possible to get all the accommodation that Montreal requires within a reasonable distance from the Custom House, it was hinted it would be better to land goods at Quebec?

A. He only said so to show that the price he had to pay for cartage of pig iron from the distant point where it was landed to the place where he wished it deposited, would be equal if not more than what he would have to pay if it was put on a barge at Quebec and brought by that conveyance to Montreal.

Q. Can you get a scale of cartage?

A. Yes, the Secretary of the Board of Trade, Mr. Patterson, will send you one. The ordinary vehicles for the cartage of goods are trucks drawn by one horse, and the load is 10 to 15 cwt., and if the distance is long the extra cost is of consequence for so small a load.

Q. Do not the Quebec passenger steamers come into the space mentioned by you and Mr. Winn?

A. Yes, they do.

Q. Do they bring goods also?

A. Yes, they carry goods also.

Mr. Fleming—I understand Mr. Winn to say, unless all the trade communication with the sea-going vessels could be confined to half-a-mile of the Custom House, it would be better to share the trade with Quebec?

Mr. Winn—Lose it altogether.

Mr. Fleming—If it is not possible to do it within half-a-mile of the Custom House?

Mr. Darling stated, that the class of cargo spoken of was pig iron, and the merchant in Quebec would be in a better position to distribute that article, if merchants here had to pay so much extra cartage on account of the vessel discharging it at a considerable distance from the city; but this only applied to heavy goods, like pig iron, and did not apply to a general and more valuable cargo.

Mr. Bell—I hardly think that Mr. Winn would submit to the transporting of goods by smaller vessels from Quebec, and the damage to goods caused thereby?

Mr. Winn—What I say is—if trade was so conducted. If those extra rates for cartage are to be charged, we should lose the trade altogether.

Q.—Don't you think those ramps are a cause of increase in cartage?

Mr. Darling—I do not think the truck could carry much more if the road was level—or that the cartage would be much decreased; it would be more convenient if the road was level.

Q.—If I understand you right, you make a distinction between two classes of cargo—one that goes into store at Montreal and the other that passes by Montreal, which is landed only to be carried away by rail or to be taken away by another vessel. Would it be advantageous to have storchouses?

A.—I think not, unless the storehouses are the property of the Harbor Commissioners or of shipping companies, and the goods are stored there for eight days after landing, free of charge. If the goods are stored by storckeeper and charged for as soon as the goods enter the store, this would add to the charges on goods, and the importer would endeavor to prevent the goods from being stored.

Q.—I can scarcely see the difference between landing pig iron at Quebec and loading coal there also; they are both heavy, and it is proposed to use Commissioners Wharf; why does this apply to pig iron and not to coal?

Answer—The distance of cartage applies to coal as well as pig iron,—it is as expensive to dealers in coal; but I fancy that dealers in coal desire to get storage provided on the wharves, so that they may not have to cart it away when landed, and the cartage would fall upon the purchaser of the coal. If the pig iron was discharged from the sea-going vessel into another vessel, to be conveyed from Montreal, it would not be subject to cartage.

Q. Could not ocean vessels, carrying pig iron, discharge the iron below?

A. The objection to this is, that the vessel may have pig iron for part of her cargo, and have for the balance of her cargo general goods, and as the pig iron would be under the general cargo, it could not be discharged before the goods above the pig iron were landed, and if pig iron was landed at Hochelaga, the extra cartage to get it to the city would increase the price of it.

Q. Pig iron and general cargo are not conveyed in separate vessels?

A. Sometimes they are, but pig iron often forms part of the cargo of a vessel carrying a general cargo.

Mr. Bell—Could a ship not be moved to discharge the pig iron?

A. It could, but at an additional expense and trouble.

Mr. Bell—I asked that, because I know it is done in the Clyde. They discharge a general cargo at one place, then the ship is taken to another and discharged of the remainder. It is rather an exceptional case.

Mr. Darling—I don't think Mr. Winn ever intended to put so much stress upon this matter. I think he only intended to show the serious trouble and expense upon any person whose goods were unloaded at such a distant point?

Mr. Fleming—The trade of the town seems to have overgrown the harbor, and if you have already felt it, what should the accommodation be when the trade doubles its present proportions, if it is not possible to do all your traffic within 3,000 feet of the Custom House.

Mr. Winn—Have the shoals removed.

Mr. Darling continued to remark, that the mercantile part of the city would long continue around the Custom House. The trade must increase; there is a large number of merchants interested in a general cargo, and you will find for a long time to come that 4-5ths of the cargo has to be delivered for merchants in the business part of the city.

Mr. Fleming—Do you know the draft of the general vessels engaged in the Montreal trade?

A. The ships vary from 600 to 1,000 tons, Mr. Watt is more conversant with this than I am.

Mr. Winn—A Clipper draws 20 feet; 20 feet is about the highest.

Mr. Fleming—Do you think it important that larger vessels should come into the harbor; larger ships or steamers?

Mr. Darling—It is a fact, that larger ships will carry cheaper than smaller ones. There does not seem to be much disposition on the part of regular lines of ships to increase very much the size of their vessels.

Mr. Watt—What would be the use of making them larger when you have not got the water to float them?

Mr. Darling—I for my own part, would rather ship goods in a vessel of 600 or 1,000 tons than in one of 2,000 because of the facilities obtained from a more rapid

discharge of the goods,—that makes me prefer the one to the other. This applies to sailing vessels.

The water is deep at Hochelaga and the wharves wide, there are ample means of discharging and arranging a general cargo for delivery to the consignees. The expense of cartage from thence, and the distance of the vessels from the merchants' warehouses, are objections to the discharge of general goods there.

If the goods from a general ship were, under the regulations of the Port, arranged on the wharf, and the different marks placed together so that the goods could be easily removed by large drays with two heavy horses, carrying say 5 tons—the expense of cartage could be much decreased, but so long as the cargoes are not arranged for delivery, and single horse trucks are used for the conveyance of the cargoes from the ships to the merchant's warehouse, the expense of cartage will continue an objection to vessels discharging general cargoes at Hochelaga.

It will only pay large drays to draw goods from vessels when the cargo is so landed and arranged that the goods they are sent for, can be got at and loaded with despatch.

If arrangements were made for the receipt of goods by the Grand Trunk Railway at Hochelaga, it would relieve the wharves near the city, as the heavy goods would be discharged, and the warehouses or yards to receive them would be provided at Hochelaga as soon as the Grand Trunk Railway were prepared to give receipts at Hochelaga for such goods.

MR. ROBERTSON, Vice-President Board of Trade, representing the
Dry Goods Trade.

I may say that we (Mr. Winn, Mr. Darling and myself) represent the largest interests in quantity, weight and value in the city. Mr. Darling represents the hardware, and Mr. Winn the iron interest, and myself the dry goods. We (the dry goods interest) have no cause of complaint. We get three-fourths of our goods by steamer; and my desire is that we should receive a little more wharf room; but, on the whole, we have no reason of complaint. I agree with what Mr. Winn says in the main. I agree with him that, in the general trade, the wharves must be in the radius given by him; but the way it is to be done, the way the improvements are to be carried out, is a question for your consideration. In regard to the increase to my own trade, I don't think you will be likely to see 50 per cent. for the next ten years; and, if it did come, it would simply be the heavy goods. It is simply a question of transportation to the west.

General Newton—In order to increase the trade passing through to the west, are there no accommodations now to be made in the harbour ?

A. I am not prepared to say; I am not conversant with it. I come here to represent the dry goods trade. The Board of Trade thought it desirable to have a representative of each branch of trade, and it will be far better to ask questions of that kind of Mr. Watt and others about their particular trade. Unless there is any special questions, with reference to my particular branch of trade, I don't know that I have anything more to say.

Mr. Fleming—You generally agree with Mr. Winn and Mr. Darling. You think that a provision of 50 per cent. for the next ten years sufficient ?

A. As far as I know. It is a matter of opinion; they have a better idea than I have. I don't think 50 per cent. will be required in our particular branch of trade.

Mr. Bell—How would it do to arch over the quays, leaving space below for the general traffic, and allowing anything to be placed there for removal at once, keeping the upper storey for storage, and discharging the ships into them ?

A. That would give us more accommodation.

Mr. Winn.—That would involve the expense of hoisting.

Mr. Robertson.—We have to pass entries; the ships begin to discharge probably next morning, and in the course of a day or two get all goods taken away. All goods unclaimed, when the sheds are cleared out, are sent to the Custom House. I don't see but that there is plenty of room on the wharf and in the sheds.

Mr. Bell.—These stores will give you more flooring ?

MR. POPE, representing the Lumber Trade.

The lumber trade is divided into two branches—export and local—consumption and export trade. I am more particularly connected with the export, and know more about it than the domestic trade. The lumber is brought in barges and put on board vessels; it takes up a great deal of frontage, necessarily. So far as putting it away from the coal trade, we shall not care how far away you put us, for it damages the lumber. As to where you locate us it is as convenient to be away from the city as in it and we would much prefer it to be at Hochelaga. The vessels are seldom of a large class; they average 15 and 16 feet draught only, and I know but few cases of their drawing 19 feet. The barges in which lumber is brought in seldom draw over 6 feet and it seems to me a wharf built with slips at intervals, on which barges could be put, say slips 125 × 50—and so as to be discharged on each side of the piers, would enable us to handle it economically; a vessel being placed at the end of the wharf. Now with a vessel at the end of the wharf, to discharge, a barge, bow

to the wharf, is difficult. It is much expense to discharge a barge if it lies all the length instead of alongside; for the local business the lumber is received in lighters and barges seldom drawing more than 6 or 8 feet. It is carted from the wharves. There would not be much greater expense to them if they were down at Hochelaga, because their custom is to sell it from the wharf and stock the yards with what is left unsold for the winter consumption. In 1873, there were 68 vessels loaded with lumber and about 32 million shipped. We loaded 52, and handled 31 million, and shipped 23 away. We then had frontage at Hochelaga and the elbow here on Victoria Pier. Having so little room it was inconvenient, as we had three deep at Hochelaga and two deep on Victoria Pier, which made it expensive. That year we cannot take as an example for others, as the trade that year was much larger than it will probably be again.

General Newton—With regard to this trade, does it increase rapidly?

A. It increased very rapidly for about six years. All this lumber goes to South America, mostly to the River Plate. Owing to financial difficulties there, the trade has slackened off very much. Last year the total shipped from the river was 16,000,000; this year it will hardly exceed 10,000,000.

Q. That is sawn timber?

A. Nearly all sawn, coming from Ottawa.

Q. You don't require accommodation for rafts here?

A. That I don't know anything about. There are a great many coming in here. They are obliged to bring them over the Rapids in cribs, and to tow them. They must be made into larger rafts, and it seems to me there should be some place for them to make up their rafts below the current.

Mr. Bell—But manufactured lumber?

A. Yes, sir; it is that that requires accommodation.

General Newton—You have not sufficient wharf accommodation?

A. Last year and this year has been light, and we have not suffered very much. Last year we had frontage of 400 feet; this year 450 feet; but the great difficulty is receiving and delivering on the same frontage; it becomes so blocked up. In 1872 and 1873, if we had had 1,000 feet frontage, we should have had the same difficulty; we had seventeen vessels laying here at the same time.

General Newton—What you want is slips?

A. Yes, sir; with about 8 feet of water.

Mr. Fleming—Would you have larger vessels where the water is deeper, and barges inside?

A. Yes, sir.

Mr. Fleming—Do you know the frontage occupied by that trade?

A. There is 900 feet at Hochelaga, and this elbow at Victoria Pier; that is for the export trade.

Mr. Fleming—Is that all?

A. Yes, sir ; that is all for the export trade.

Mr. Fleming—Is that sufficient ?

A. No, sir ; it has not been sufficient for a number of years.

General Newton—If you had that frontage improved by slips, as you describe, the same length of harbour front would do you ?

A. They don't require so much surface room.

General Newton—Then, as well conversant as you are with the lumber trade, do you consider it large enough to require a basin for itself ?

A. No sir, I do not ; I think it requires to be by itself, because other merchandize is seldom loaded with it. It is bulky and cannot be handled quickly. It is no use having it come in anything but barges ; they must be unloaded quickly, and it cannot be removed very quickly unless convenient to the piers. I speak about the export trade.

Mr. Fleming—And which now occupies 1,400 feet ?

A. Yes, sir ; it requires storage apart from other merchandize.

Mr. Fleming—How wide should these piers be ?

A. A vessel averages about 160 feet in length. They might be so as to take one vessel at the end of the pier, that is 150 feet ; the barges could go up into the slips.

Mr. Fleming—What depth for the slips ?

A. 100 or 125 feet.

Mr. Fleming—Occasionally longer if required ?

A. That is the length.

Mr. Fleming—The length of the pier ?

A. Yes, sir.

Mr. Fleming—And the projection breadth from one side of the pier to the other ?

A. Yes, sir.

Mr. Fleming—Do you require to keep lumber there during the winter ?

A. It would be convenient because now we have to move it or the ice would take it away.

Mr. Fleming—What draft are the vessels in the trade ?

A. They seldom exceed over 18 feet. I don't think of all the vessels we ever had that above three exceeded 18 feet. We have loaded about 200.

General Newton—Can't you give us an idea of the room necessary for the retail trade ?

A. Well, I don't see how they can get along with much less room than now. They occupy the back of the Military Basin (place indicated on map by Mr. Pope).

Mr. Watt—Why should they not be down in the canal ?

Mr. Pope—Well, there is a great deal of it down there, but it makes very long cartage to go from there to the east end. I think the retail trade requires a depot in each end.

Mr. McLennan.—There is fully one-half the city trade done on the line of the canal.

Mr. Pope.—More, now, I think.

Q. Is there more on the line of the canal than on the Military Basin?

A. Yes, sir; double, perhaps. At the extension of the Longueuil Ferry, there is a very low draught of water, which I don't see how they can use for anything else, but the domestic lumber trade.

Mr. Bell.—That is in the strongest part of the current?

A. Yes, sir.

Q. I believe you mentioned that that trade will increase very much, and just as the city increases?

A. Just as the city increases; that is all.

Mr. Bell.—How is lumber discharged from vessels? Is it all by hand?

A. All by hand. It is piled on the docks, and then carted to the piling ground.

Mr. Bell.—What do you do with it in winter?

A. The retail men cart it to their yards. They all have yards, but keep most of their stock piled on the wharves, and sell from there in summer time. What they have left, they stack in their yards for the winter trade.

Mr. Fleming.—What provision should be made in addition to the present? Ten, twenty or thirty per cent?

A. I don't believe it will increase over ten per cent. I don't think the accommodation required, in addition to the present, is over ten per cent. If the trade increases twenty-five per cent, or thirty per cent., ten per cent. increase on the accommodation will be sufficient.

Mr. Fleming.—So that is a matter of 3,500 feet. It is small?

A. I know it; but we can increase the quantity on the same amount of ground, if the trade increases rapidly; the ground will be uncovered three or four times.

Mr. Fleming.—In fact, you don't think any great increase is necessary?

A. No, sir.

Q. That is for the retail trade?

A. Yes, sir.

General Newton.—How with the export trade?

A. It depends how they manage their governments in South America. Perhaps in two or three years we shall have more than we can do, and perhaps not. The first cargo shipped was nine years ago. Seven years ago was the commencement, when six millions was shipped, and that increased until 1872, when there were 23,000,000; and in 1873, 32,000,000, and then fell a little, until last year it was only 16,000,000; and this year it will not exceed 10,000,000.

Mr. Bell.—Was that chiefly for Buenos Ayres?

A. Yes; and some to Valparaiso and Callao.

General Newton.—Ten years ago you had no export?

A. It went another way ; it went through the United States. There is another reason for this : Last year there has been an increase in the quantity of lumber shipped from Boston and New York. The expense in the river-towing and so-forth, increases the expense of vessels, so much so, that we have had to pay higher freight than from Boston and New York. The towage on the river, to my knowledge, on one vessel alone, of 600 tons, was \$1,100.

Mr. WATT, representing the Shipping and Grain Trade.

I don't think that any of the gentlemen, who have spoken, have brought before you one somewhat unique feature of the business of the port of Montreal. It is not the local trade of the city which makes its foreign business. If ships brought here nothing but what Montreal requires for her own trade, or took away nothing but what Montreal produces, our harbour accommodation would be amply sufficient. Montreal is, in fact, the forwarding factor of the producers and consumers of the continent, and is in many respects at a disadvantage in competing for this trade, when compared with the seaboard rivals on the Atlantic coast. Chief of these disadvantages is the fact that Montreal is shut up by ice for five months of the year, leaving only seven months of open water during which shipping business can be done. Nor is the trade of these seven months regular or continuous, but on the contrary it is crowded into six weeks at the beginning, and six weeks at the end of each season, the latter term being usually the heaviest. One consequence of this state of things is that all our local facilities for transacting this business have to be on a more ample scale than would otherwise be necessary—have in fact to be sufficiently ample for the maximum trade of the busiest month. During the five winter months these appliances are idle ; during the three to four summer months they are only partially in use, and during the remaining three to four months they are taxed to the utmost of their capacity. The same fluctuations are also noticeable when the trade of one year is compared with that of another for a series of years, such fluctuations being the result mainly of the greater or less demand for American commodities in Europe, and the American surplus of such commodities available for export during the same year. The chief of these exported commodities is grain, which forms three-fourths or more of the entire volume of our exports from Montreal. I mention the grain trade because it is the branch of business with which I am most familiar, and because it affords me an opportunity to bring under your notice instances of how private enterprise has provided against a press of business in the transport trade in grain.

A very large proportion of the grain received at Montreal is water-borne by lake-going craft from the western port of shipment to Kingston at the foot of Lake On-

tario. These lake craft are chiefly sailing schooners, costing one dollar and upwards per bushel of their capacity, and run at an expense of about \$650 per month for vessels carrying 20,000 bushels. Steam propellers costing two dollars or over per bushel capacity, are also employed to a small extent, they carry a maximum of 17,500 bushels, and are run at an expense of about \$2,000 per month. At Kingston the grain is transferred from the lake craft into river craft, at the rate of four or five thousand bushels per hour, by means of floating elevators, at a cost of some thirty-five or forty cents per hundred bushels. These river barges are by far the most convenient and economical conveyance for the transport of bulk grain on our canals and rivers which have yet been devised. They carry about 20,000 bushels as a maximum, cost about \$10,000 for that size, or only fifty cents per bushel of capacity, and are run at an expense of \$150 per month. They can make the round trip from Montreal to Kingston and back to Montreal in eight or nine days, including 24 hours detention at Kingston for unloading the upward cargo (if any), and receiving a full load of grain. These craft are without propelling power, and have to be towed both ways, at an additional expense of about \$175 per round trip for tug steamers on the river and horses on the canals. The regular freight charge from Kingston to Montreal is from three cents to three and one-half cents per bushel, in which is included the cost of loading and unloading the barge as noted above, or equal to about one dollar and fifteen cents per ton for a distance of about 192 miles. These barges are also frequently used as storehouses in the harbour of Montreal, for the convenience of the owner of the grain without charge over or above the freight; they deliver their cargoes at any vessel or warehouse within the limits of the port. There are general forwarding companies engaged in this business; together they have transported from Kingston to Montreal during the present season of navigation, from May 1st to October 1st, five and one-half million bushels of grain, while they have capacity to carry, and could easily have transported, if third craft had been regularly and steadily employed, at least three times as much or say seventeen million bushels. I may here very appropriately call your attention to the liberality of Parliament in having provided our magnificent system of artificial navigation from hence to Kingston, for the use mainly of this class of craft—a system which is unsurpassed by any similar work in the world, and which from the lowness of the tolls may almost be said to be a free gift to commerce.

The same immense surplus of accommodation, for the express purpose of preventing blocks, has also been provided by private enterprise by the owners of the grain warehouses of Montreal. In seven distinct storehouses, all provided with elevating machinery, upwards of two and a-half million bushels can be accommodated at one time, whereas the average monthly stock held in warehouses this season, say June 1st to October 1st, has been only 290,000 bushels, against 425,000 bushels in 1874, and 660,000 bushels in 1873. The rent charge for warehousing grain is about one and one-half cents per bushel per month during open navigation, and three cents

per bushel for the whole winter term of five months, the warehouseman being responsible for quantity.

Very contrary to all this has been the course of the Harbour Commissioners. No such liberal accommodation has ever been provided by them; on the contrary, with high tolls and with a constant surplus of revenue, the accommodation provided has always been poor and deficient, and in cases of a press of business, the break-down has been most lamentable. I have one instance in my mind which is matter of public notoriety, to wit: the autumn of the year 1871, when so many vessels were caught by ice in the St. Lawrence, many of them wrecked, and others detained until the following spring. Three vessels belonging to the Allan line, the "Ardmillan," the "Pomona," and the SS. "Germany," reached Montreal on the 6th, 11th and 13th November respectively. With berth-room at once available, these vessels might easily have been discharged and loaded in three or four days, such despatch being regularly given whenever required at the Messrs. Allans' wharves. But, for lack of this berth-room, notwithstanding the most strenuous efforts of their owners, and the fact that their loading cargoes were awaiting the vessels convenience, it was the 24th of the month before they were able to clear from Montreal. The consequence was that the "Germany" barely saved herself by slipping through the Traverse to sea with the last open ebb tide, but the "Pomona" and "Ardmillan" were caught, their tow boats had to run for shelter, and the vessels themselves were frozen in, the "Ardmillan," in company with other vessels, being a total wreck. The losses that season, without doubt, amounted to more money than the entire cost of the needed accommodation.

The previous speakers have correctly expressed the wishes of our merchants generally, in desiring that the increased accommodation should be afforded as near to the Custom House as possible, and along the present river frontage. I think that if the berth-room presently available in the distance, between the entrance to the canal and the old barrack property could be doubled within four or five years, such enlargement would probably suffice for the next decade. But any scheme would be inadequate, which did not provide the means of regular and continuous increase, should such be wanted in the more distant future. Within this area, all the berths should be deep-water ones and suitable for the largest class of vessels. The water should be free from currents, and should, as far as possible, be of uniform height. If the area indicated was protected from ice shoves, and the wharves raised so high as to be above the high water mark, and thus permit of the constructions on them of such permanent wharf structures as are common in most sea ports on both sides of the Atlantic, the advantage to the shipping trade would be very great. Such storehouses would be largely used for the transit trade in provisions, and other rolling and package freight passing from the West to Britain, and also for the storage of such imports as are sold and distributed in the original packages. Of course, the question of cost comes in here, but I think that, as regards this matter, the previous speakers have been too con-

servative. I don't think the gentlemen who built the grain barges and grain warehouses, before-mentioned, would have so spent their money, if interest for it had first required to be assured to them; certainly no public work, nor railway, nor steamship line in the country would ever have been built on those terms. The first canal system from this to Kingston was not taxed to one-fourth of its capacity, when the country set about creating the present one, which in its turn and under similar conditions is about to be still further enlarged at the demand of Parliament. I deem it to be the duty of the Harbour Commission to go on, if not to this extent, certainly in this spirit—to keep not merely abreast of, but steadily in advance of all possible requirements, and to anticipate an increase of revenue by providing a liberal increase of accommodation.

The tonnage and draught of water of vessels trading to this port have, of late years, increased very materially, and have been under-estimated by previous speakers. I think that two-thirds of the tonnage is of twenty feet draught and over, and as much as one-third of it of twenty-four feet and upwards. Nor can there be any reasonable doubt that the limited draught available here has necessitated a style of vessels suited to the navigation, and that if unlimited water had been available, the class of vessels trading to the St. Lawrence would have been similar to those trading to New York. Certain it is, that neither as regards accommodation nor draught of water, has the harbour of Montreal kept pace with the tonnage using it. Whether the maximum size of vessels has now been reached, I am unable to say. The newer steamers on the New York and Liverpool route are now about 5,000 tons measurement, and twenty-seven feet loaded draught of water.

The vessels now coming to Montreal are very inconveniently accommodated at several of our piers, which were designed many years ago, when our regular traders were vessels of four or five hundred tons. When providing new piers they should scarcely be less than 600 feet long by 200 feet wide, and the slips between the piers about 300 feet wide, so as to give water room for barges, elevators, etc., etc., to the ships on both sides.

Mr. Bell—You speak about the wharves. You consider that the wharves should be carried to such an elevation as to be free from ice?

A. I think it would be a great convenience to the city if such were possible. If we were free from ice it would be of great service to Montreal and the trade generally.

Mr. Bell—Another point: you would like the water to be always the same height. Then, if you had basins you would have them to lock?

Mr. Watt replied, that the cost of locking would be more than counterbalanced by the facilities for unloading. Vessels could not lie in this harbour without being ballasted; great care had to be taken in unloading. If still-water could be obtained, it would be of material benefit. This, he thought, could be done by some system of locks.

Mr. Bell—What varying height of water have you at the wharves?

A. The variation will be two feet above the wharves in the early Spring, and six to eight feet below them.

Mr. Bell—That is not occurring every day?

A. It is gradual; one part of May it rises, after that falls steadily until about now. A uniform height of water will be of benefit to the ship. One advantage of uniform height is, that it admits of permanent arrangement for discharging vessels.

Mr. Bell—Is that your view from actual practice?

A. I have had no practice; there are no docks in any American sea-port.

Mr. Fleming—It is an opinion?

A. So far as that goes, it is an opinion; but I have found uniform height of water, such as we have in the canal basins, of great service in planing stores, and carrying on work there.

Mr. Fleming—The change in the position of a vessel is continuous while she is discharging and loading cargo?

A. Decidedly.

Mr. Bell—Suppose you had lockage, where would your water supply come from?

A. Well sir, I am speaking as a merchant, not as an engineer. I presume you could get plenty of water from the canal, but I don't profess to say anything on that point.

Mr. Bell—As regards the position of business. If a basin was made, what part of the river would you consider the most likely to meet the wants of the trade?

A. Just opposite the city.

Mr. Bell—In addition to that, suppose you wanted basin accommodation to be taken from the land or canal?

A. I don't think there is any room on the land or in the canal. Any basin we get must be taken from the river.

Mr. Fleming—I think you said that the provision for the trade of the harbour, if increased 25 per cent., would be ample for a year or two?

A. Yes, sir. I think an increase of 25 per cent per annum, during four successive years, would be ample; if, for instance, we could double the present available wharfage space, from the mouth of the canal to the Bonsecours Church, in the next four or five years—that is, if we could get space to discharge twice the number of vessels,—it would be ample accommodation for ten years to come.

Mr. Fleming—Why four years?

A. At the end of four or five years, I certainly would double it. I think provision should be made for an increase, of not less than 20 per cent. per annum, so that the accommodation at the end of five years will be double what it is at present.

Mr. Fleming—Is not 20 per cent. wanted now?

A. Yes; immediately; at once.

Mr. Fleming—How much do you think it should be ten years hence?

A. I think nothing but the experience of the next ten years would justify any calculation for a succeeding term of ten years more.

Mr. Fleming.—I know it must be conjecture.

A. I doubt whether the continent of America is going to export, in future years, in a continuously increasing ratio. Its consuming power is steadily increasing, and the grain-producing regions are, year by year, getting more distant, and the trade going further west. I doubt whether the exporting business of the eastern part of the continent is going to increase in the next forty years as in the past forty years; but I think it is the duty of the Harbour Commissioners to keep ahead of business.

Mr. Bell.—I understand you would protect these piers from ice?

A. Yes, sir.

Mr. Fleming.—You hold more sanguine views than other gentlemen. They think the increase of 50 per cent., in the next ten years, will be ample; you state that you think there should be an increase of 100 per cent. in four or five years?

A. I do think so.

Mr. Fleming.—What do you think about ten years?

A. I think if we had double the accommodation at the end of five years, that would probably suffice for the other five. I think any plan should be progressive and economical. We don't want any gigantic scheme involving large expense and bringing in no revenue until it is finished.

Mr. Bell.—Do you think want of accommodation has driven much trade away?

A. Certainly I do, and has cost Montreal a deal of money.

Mr. Fleming.—Assuming that the trade of Montreal increases, say double in ten years, can you say what it will increase in the following ten years?

A. I am not so sanguine as my friends. I don't think it will increase in the the same ratio.

Mr. Fleming.—I have got down—There is now 11,300 feet of wharfage. In your opinion, there ought to be 14,000 feet at once, and, in ten years, there should be 30,000. What in twenty years?

A. I don't think the trade will again double itself.

Mr. Fleming.—If it increases 100 per cent. in the first ten years, might it not increase 30 per cent. in the next ten?

A. Personally, I am not so sanguine of the continued increase of the shipping business of the country.

Mr. Fleming.—Do you think it will increase at all after ten years?

A. I should hope it would, but cannot give an idea of the extent of such increase. The two heavy exports are lumber and grain. The lumber is being depleted, and the grain trade is rapidly going more inland, and more inaccessible so far as Montreal is concerned.

Mr. Fleming.—How is that trade carried on? Do the barges come down to the harbour of Montreal and tranship to the ocean-going vessels?

Mr. Watt explained, in answer to this question, that the grain from the inland ports was transferred to canal craft at Kingston, and was lightered to Montreal; nine-tenths of the grain cargoes, so received, was transferred from the barges to the ocean-going vessels. This was a great convenience to the ocean-going vessels.

Q. Is it necessary for vessels to lie at the wharf to receive the grain?

A. It is not necessary, except the sea vessel is discharging and loading at the same time. They cannot perfectly unload these vessels before partially loading, so the two processes are carried on simultaneously, discharging the inward cargo on the wharf and loading with grain at the same time. The grain is transferred from the barge very rapidly—four or five thousand bushels an hour.

Q. How long may these barges be kept waiting?

A. That depends. If the tonnage is ready, the barge can get away very quickly; if it does not find tonnage awaiting it, the barge is delayed, and becomes temporarily a warehouse.

Mr. Fleming—Is there not a deal of detention?

A. There is, frequently. The barges are expressly used for that purpose; they are floating warehouses, and can be kept for the accommodation of the owner of the grain.

Mr. Bell—Does that not cause a want of barges at Kingston?

A. Yes, sometimes.

Mr. Bell—Would it not be better to discharge into warehouses?

A. I think it would prove too costly to discharge *all grain* into warehouse. Such grain as is to be held in stock will probably be stored, but such as is destined for speedy shipment could more profitably be left in the lighter until the sea vessel was ready. This is the custom in New York.

Mr. Bell—You cannot send a ship to the warehouse for grain?

A. Not as at present arranged.

Mr. Fleming—Do you think it would be an advantage to have provision made for taking ships up to the level of theachine Canal?

A. Government is providing such accommodation; I think it will be of service.

Q. Do you think warehouses on the wharves would be an advantage?

A. Yes, sir; warehouses on the wharves would be a great advantage for a good deal of the import and for all the export traffic, but not for heavy goods, such as coals, rails or lumber.

Mr. Fleming—Then you are of opinion that you should not have these heavy trades in the harbour?

A. No; not to encumber the harbour with.

Mr. Bell—These canal basins, as far as I can see, are intended for vessels that are going up to break cargo, and send it up the canal?

Mr. Watt—They are for light-draughted sea vessels; and it is part of that scheme to have warehouses built on the border of them, and receive cargoes direct.

General Newton—Then they are really making these basins—not for the purpose of canaling, but for the harbour?

A. Yes, sir; the basins are not for canal purposes.

Mr. Bell—You have no authority to state this?

A. No, sir.

Mr. Bell—We cannot get a definite answer about this matter without a conference with the Government authorities; you will see they are digging two basins, which are of no service from a canal point of view?

Mr. Watt—I regard them as an addition to the wharfage of Montreal.

Mr. Fleming—But still not sufficient for fully developing the trade of the port?

A. Oh, no sir; not nearly sufficient.

Mr. Bell—Not sufficient for what the channel is being dredged to?

A. Oh, no sir. They are for light draft vessels only.

Mr. Fleming—These basins admit vessels drawing 18 feet. Do you think it would be an advantage to have them made to admit vessels of larger draft?

A. I don't think so. It is an advantage to have light drafts for certain vessels. I think there should be a variety of drafts of water provided. I doubt whether those basins could be fitted for deep-drafted ocean-going vessels, and to fit them for such would be re-modelling the whole of the canal basins and locks.

Mr. Bell—There is another matter I wish to question you about. There has been a long projected matter of bringing down water for milling purposes from Lachine. Do you think that would be taken advantage of if the water power was provided?

A. I think it would be used as the city required it, but I scarcely think, from a mercantile point of view, it belongs to the Harbour Commissioners to find water for milling purposes.

Mr. Fleming—Do you attach much importance to that matter?

A. No, sir. Of course everybody has their own opinion. Flouring grain has not been a profitable business in Canada. There is too much milling done to make it profitable.

Mr. Bell—There are other manufactories that would spring round water power?

Mr. Watt—I think Montreal offers great facilities for manufactures of various kinds.

Mr. Fleming—Can you explain why milling flour is not profitable?

Mr. Watt—The reason is, that the milling power of Canada is greater than the consuming power, and, as a rule, foreign countries prefer the grain in the berry. A very large bulk of the cereals are in that form, to wit: corn, wheat, peas, etc. A very small proportion is first milled, and then exported.

Mr. Bell—A great deal of flour goes to Glasgow ?

Mr. Watt said, that this trade had decreased of late years, and that vessels had gone from here with their middle compartments empty, for want of flour freight.

Mr. Bell—Is there flour sufficient here ?

A. Yes, sir; plenty. There is no demand for it abroad, the tendency being to order the grain rather than the manufactured article.

Mr. Bell—Has the trade changed in your experience ?

Mr. Watt—During my experience the exports of flour, some years ago, were heavy, but in the last few years it has become less and less.

General Newton—The flour export trade is decreasing.

Mr. Watt—Very materially decreasing.

Mr. Bell—How about New York ?

Mr. Watt—The same holds good as to New York, as regards shipments to Europe.

Mr. Fleming—Grain increases, while flour falls off.

Mr. Watt—Yes; purchasers prefer wheat.

General Newton—Your idea of raising these piers was to be free of ice flows ?

A. Yes, sir.

General Newton—And to have piers and warehouses ?

A. Yes, sir.

Mr. Watt remarked, that the Government plan for harbor enlargement met his views better than any other yet published. He would have preferred the retaining pier to have started from the abutment of the Victoria Bridge rather than from the Commissioners' Wharf, so as to enclose a much larger area, and, while he did not consider that this retaining pier would be of much service to the city trade, it would be found invaluable for railway traffic.

SECOND DAY'S PROCEEDINGS.

The Board met on 7th October, at Ten o'clock, and resumed the hearing of testimony from

MR. HUGH McLENNAN, Harbour Commissioner.

What I have to say is, from my own connection with the transportation business, and the points that have, from time to time, come under my own observation, both as connected with the transportation business and as a dealer in grain. The points that were put before you yesterday, represented very fully what I would call the special trade interests of Montreal—the trade that belongs to the city proper in its mercantile business—that is, the general trade, hardware, dry goods, groceries, coal and lumber. These are the imports that must come to us to the extent to which they are used and distributed. Mr. Winn, I think, set forth the necessity of the point of accommodation, being as near the centre. He used an illustration that was striking, that was only intended to show the disadvantages of distances, by saying the charge of cartage to his store was as large as if it had come from Quebec; not that he could load at Quebec, but to strike a comparison to show the disadvantage of long cartage. I would hardly assume that the disadvantage was so great, and yet I can understand it to be a great disadvantage to the trade. The additional charge to the cartage, more particularly on the cheap kind of merchandise, Mr. Robertson said there was not so much difference. Another point is, that to the extent of the capacity of the vessels engaged in the general import trade, provision has to be made to load them where they have discharged, inasmuch as it takes a short time to load them, and they cannot leave their berths at any rate. The coal trade was dwelt upon, and forms an important item, inasmuch as it is a trade that increases very rapidly. In consequence of the diminished supply of fuel for domestic purposes, coal has to take its place. The accommodation has been very limited and not sufficient to accommodate the trade. I don't know what extent of accommodation might be sufficient, but there must be accommodation at both ends of the city. The Gas Company is a large consumer, and they have accommodation opposite their own property. That must be left out of the estimate, which will form a very large item. (The figures may be ascertained, and filled in hereafter.) For general city purposes, there ought to be a point of discharge at the east end, to give accommodation there,

At the west end, the largest amount of accommodation will be necessary. The tendency of the city to most rapid growth is in the west end. One or two points may be looked at. The volume of it is largely centered. The Gas Company and the Grand Trunk are the principal consumers. Assuming Mr. Henshaw's statement of 200,000 tons to be correct, more than one-half is taken by those Corporations, so that it leaves, for general purposes, 100,000 tons. The anthracite coal that comes from the States is in small barges, and has to be accommodated in different places; that is for city purposes and general distribution. A wharf that had eight feet of water would be sufficient for that description of coal at any other place.

Mr. Bell.—That is either at Windmill Point or down below?

A. Yes, sir. With regard to the lumber trade, I think the statement made by Mr. Pope exhausts anything I can say on the subject. He pointed out the description of accommodation necessary for that—that it required a large amount of dock frontage for the receipt and discharge of vessels—that when fully occupied in the largest years shipments, they laid three deep and end on to discharge, which involved a large amount of expense and great loss of time. With reference to the increase of accommodation necessary, the providing of proper accommodation for each canal would relieve the centre of the harbour, from which, if we have received 200,000 tons, there has been 100,000 discharged indiscriminately from one end of the wharf to the other in carts, and it can be seen how much that embarrasses the trade, it throws additional cartage in the centre of the city. That when coal berths are provided, and the supply sent to those parts will relieve the centre, and then the objection to moving vessels with other property. It was suggested, "why not discharge pig iron below, not to interfere with the general trade." Simply because it comes in small quantities in vessels that are partly loaded with other articles, that is their bulk proper, but coal comes in entire loads and can go to the coal berth to discharge. Railroad iron comes often in the same way and may be located for discharging and put out of the way of the trade; but these occasions are exceptional in that respect. When accommodation for coal is provided, say for 300,000 tons, the same space will accommodate 600,000, and with an additional twenty per cent. will provide double that. But, in providing that accommodation for coal, you relieve the other trade very much. The same applies to rails. When the discharge for coal comes up, the question will be, whether the Government cannot better provide it in 13 foot slips than the Harbor Commissioners. For instance, if there is property sold or leased on the new canal basins, the Grand Trunk Railway will probably try to get a yard in which they can discharge their coal direct from vessels, and other people engaged in the trade might find it convenient and saving in expense to them if they leased a slip. It will be important to them if the yards will be above the inundation. Here again the question comes up of a conference with the Government on the subject. It is a community of interests, and a question whether it cannot be effectually provided for and at

less cost. The question that next comes in is, the draught of water of vessels engaged in it. I thought, yesterday, there was a little confusion of it in speaking of the vessels from 16 to 18 feet. There is a large number of vessels that are not entirely engaged in the coal trade. There are vessels that come here to load for export; they start from Sydney, Pictou and other gulf ports, bring coal here and take back general cargo—is a question of tonnage, though, there is no doubt, there is a considerable number of vessels engaged in the trade, but there is a considerable amount of coal brought in by vessels coming here for grain cargoes, yet the question of discharging in canals would apply, and it is one of those things that will adjust itself. If the Grand Trunk Railway had a canal yard for their coal traffic there, they would exclude large vessels, and large vessels would then be engaged for Wind Mill Point or east end coal trade.

Mr. Fleming.—If you had two wharves, one might be of 18 feet and the other 25 feet. Would that do?

Mr. McLennan—I would suggest 20 feet, assuming that a large number of coal vessels would go into the canal, and the channel deepened to 22 feet, and the water for the wharves 25 feet.

Mr. Bell—Coal would go into the canal then?

Mr. McLennan—Yes, and come to these points, there is another point. We were looking too much to provide a definite amount of accommodation for each branch, but there being nothing peculiar in the requirements for each. If the coal becomes a large trade, which it undoubtedly will, it will absorb more space, and if the general trade becomes largely increased, it will crowd out the other trade. The law asserts itself there, that the valuable trade will have the best accommodation. I might say, the most pressing necessity,—it was dwelt on yesterday,—is accommodation for the different lines of steamers in as convenient a point as possible. There have been disputes—the Canada Shipping Co. have been at great disadvantage, perhaps; but the law of priority held good, and will continue until, in the re-adjustment, they are provided for. This is a pressing necessity. One or two other questions that were raised in looking to the increased accommodation, are worthy of consideration; first, that of providing warehouses. Very much of the trade, that we have here, is erratic in its volume. Trade grows for a few years, and then we lose it. Those engaged in it find that a slight difference in charges diverts the trade. I am speaking of one or two items. I was looking over this morning, and I notice, going back ten or twelve years, that we carried for the Chicago market, 10,000 sacks of salt in one season. We attained to that volume at one time. That large trade ran over many years. That has diminished, and is now insignificant. The same with rails and pig iron. These three items have almost disappeared from the volume of our trade. It was found, by those engaged in the transferring of rails for Chicago, our 25 cents wharfage here was a very great item in competing with New

York. The merchant said, I can get it at 8s. to New York, or at \$4 American money from there, which is \$3.50 in Canadian money. Assuming that the freight can be got to Montreal for 8s. out of the \$3.50 that will be paid from here, there had to be paid 25 cents for wharf, which reduces it to \$3.25. That shows how closely calculations are made to any additional charge. If we make charges high, we divert our trade. With grain, in the same way, any person outside the trade will say: Why lie ten or fifteen days with grain? Why not discharge it into a warehouse? The man who has embarked in this trade, calculates to make one per cent., and he calculates it to be shipped from the barge to the vessel. If it goes into store, the charges before it reaches the vessel will amount say, to two per cent., so that he loses one per cent. A merchant in Liverpool telegraphs to New York and Montreal for wheat. If the man in Montreal is one cent higher than the man in New York, it goes to New York, and if he was to include storage it would be still worse. If we went to the expense of going into warehouses, and had to sell out again, we should destroy the trade. The gentlemen in the trade in Montreal hold it with a very frail grasp, and he has to reach out as far as Lake Michigan for his trade, competing so closely that a feather's weight will divert it sometimes. To my mind we cannot undertake anything that will involve a very heavy tax upon the trade. I hope I make the point clear. It is only those engaged in the trade that comprehend what a tender thing this trade is. It is pleasant to talk in after-dinner speeches about the magnificent St. Lawrence, but it simply brings us what we reach out after, and what the closest calculation will bring us by competing for, and by a slight mistake it would pass us.

Q. How is it in New York? Do they load from warehouses?

Mr. McLennan—Largely from canal boats; the difference in New York is, that it is a general trade; the man that has a general trade shoves his cargo in store, and keeps it until some one in the city, interior, or coast, comes along, and he has to pay the additional charges; we are confined to the export trade; if I sent a cargo to a warehouse, it will have to lie there until I sent a vessel, and put it aboard; again, we have no outlet but the one; I may say, whilst on this question of charges, that a very large amount of the heavy trade is done, without landing or incurring expense; if I sell salt in Chicago, I have barges run alongside to discharge it into the vessel; the same with Mr. Winn, with his pig iron; he sells in Chicago, and having several shipments coming forward, he will make some arrangements with some one in the forwarding trade, to receive it from these vessels and forward it; and of all these heavy items that are carried forward without involving additional storage or expense, our aim is to do it in that way, avoiding these expenses; it is only the general trade that goes into the storerooms; the increase of general city trade can be fully accommodated when you have done away with the confusion, by having forced a large amount of trade on the docks, where it was not systematized, where coal is discharged in the centre of the city without system, and the Grand Trunk running along the entire front of the city, leaving only 50 feet of wharf; it is this that causes

confusion, and burdens the easy flow of business; when this has been adjusted and systematized, then it will afford a large amount of business accommodation for increased grain trade; what we want is water space—a large water space; suppose you run out these slips 600 feet, with base of 100 feet.

Q. Basin, slip or pier?

Mr. McLennan—Piers. These piers need not be very wide; the stuff being removed rapidly, excepting for the regular lines of steamers, they will require sheds to be erected over their piers, but when it comes to a question of slips, it requires a good deal of berth. Here, for instance, is a vessel that is discharging,—if she is to receive grain, the elevator has to go in here, and the barge outside. Here you can have the same thing on the other side, and there must be opportunity for others to pass in and out, so that you require for the slips a good deal of approach.

General Newton—Your piers don't want more than 100 feet at the base?

Mr. McLennan—I think not; you cannot afford to have narrower slips.

Q. 250 feet width of slips?

A. Yes, sir.

Q. And less than 100 feet width of pier?

A. Yes, sir; rather less. I may say the Harbour Master will give you some valuable information in this connection.

General Newton—This is for grain trade?

A. Yes, and I say the grain trade is really the large volume of business; 14,000,000 bushels has gone out of this harbour. Its tonnage is in excess of anything else, and I may say it is this trade that is crowding everything else. I look upon it as the largest trade of the harbour, and we cannot compete with other points if we are one half cent higher. It is a flexible trade.

General Newton—May I ask, is it your opinion that the grain trade is better for the present, with the storage confined to canal boats?

A. That is my impression, that the grain trade will not afford expense of storage.

Mr. Bell—Therefore, you must resort to canal boat for storage.

A. Yes, sir.

Mr. Bell—In the arrangement you have here represented, the steamer goes in here, discharges her cargo on the slip, and is taking grain on the other side?

Mr. Fleming—The length is not important; it might be less than 500 feet.

Mr. McLennan—I hold that it would be best to get the greatest possible length; your limit would be the entrance to the Lachine Canal.

Mr. Bell—Any distance can be utilized?

Mr. McLennan—Yes, sir; any distance.

Mr. Fleming—You said something about the Grand Trunk track; is it too near the base of the piers?

Mr. McLennan—Our docks will not admit of it, if any other way could be devised for their accommodation.

General Newton—You think it ought to be put back ?

Mr. McLennan—I would appropriate to them a pier.

General Newton—Is it any convenience for general trade ?

Mr. McLennan—Nothing more than running goods down there and leaving them to be loaded, and it embarrasses the trade very much. The question is, whether they should be allowed to cross the canal, and have a depot here [place indicated] for general goods.

General Newton—You don't want them running down with freight ?

Mr. McLennan—It looks to me as if it was doing damage to the general trade, rather than any advantage it might be to have it.

General Newton—Your opinion is to have a depot up here for them ?

Mr. McLennan—Yes, sir ; my idea is to give the Company ample accommodation where they would not embarrass the entire trade, and not embarrass the traffic on the harbour frontage.

Mr. Bell—In fact, you want the whole of this frontage unencumbered ?

Mr. McLennan—What I would say is: give them a pier here, and say to them, you have got your own place to go to—go to it.

Mr. Fleming—Perhaps they will say, we receive a great quantity of general goods ?

Mr. McLennan—Then I would say, provide accommodation at the upper end. We will allow you to cross the end of the harbour, but cannot allow you to go down the whole face of the harbour.

Mr. Bell—They have got permission ?

Mr. McLennan—A sort of permission ; slipshod permission.

Mr. Bell—Don't they rail grain ?

Mr. McLennan—They cannot discharge it, except by sacking. The great volume of this grain trade has to be done with vessels. A barge will bring 20,000 bushels alongside a vessel, and discharge it in four hours.

Mr. Fleming—How many tons is that ?

Mr. McLennan—About six hundred tons.

Mr. Fleming—That would make three or four trains.

Mr. McLennan—Yes, sir.

Mr. Bell—No advantage comes by railing it ?

Mr. McLennan—No, sir. Last year, of the volume of business, which was 14,000,000 bushels, nearly 12,000,000 bushels came by barges.

Mr. Bell—In your present condition, you don't want store-houses ?

Mr. McLennan—We could not use them at any point at a reasonable expense.

Mr. Bell—Would that sort of thing change if the volume of business became greater ?

Mr. McLennan—The only case in which store-houses would serve the purpose, would be if we had a reciprocal trade that would give us trade from New England.

General Newton—Suppose you had flour here, how would that be to take it to New England ?

Mr. McLennan—If we had trade with New England, we could do with warehouse capacity ; we have storage capacity on the line of the canal for three million bushels.

General Newton—You don't want store-houses ?

Mr. McLennan—I don't think we could pay for them ; if you could load vessels direct from the stores, it would be different ; in New York they have got enormous trade that we don't touch at all, such as rice, coffee, sugar and tea, which they hold in immense quantities ; we don't touch that trade in large quantities ; in fact we are a sort of pedlars ; we may acknowledge the truth that we cannot pay rent and keep shop as a large depot of merchandise.

General Newton—This is a tentative effort, this grain trade ?

Mr. McLennan—Yes ; we reach out, but we are under a disadvantage, because we have not got a general trade.

Mr. Bell—Would not warehouses for receiving cargoes and storing grain be desirable ?

Mr. McLennan replied that, suppose they afforded this accommodation for the Allan Line, the Dominion would say they had got to have the same, then the London Line would say the same, and the Canada Shipping Company the same ; the result is, that whilst one warehouse will accommodate all, we get into difficulties by having to provide six times the quantity of storage room, because we cannot distribute their accommodation otherwise.

Mr. Bell—Still if this trade grows so that you require additional accommodation, it might be time to look-out and to make provision ; I can see it is very expensive to keep barges waiting so long as you have to do sometimes ?

Mr. McLennan—It is, no doubt.

Mr. Bell—If vessels go to Kingston to be discharged they want the barges to discharge into them, and if they have the barges here they would charge demurrage ?

Mr. McLennan—No ; then we should insist upon the grain being discharged from the barges here into the existing warehouses.

Mr. Bell—When you do keep barges, it is by agreement ?

Mr. McLennan—Yes, sir ; the general understanding is, that in 24 hours it is to be discharged.

Mr. Bell—In that case it is desirable to have storage provided ?

Mr. McLennan—It goes into the warehouse when necessities arise.

Mr. Fleming—What do you pay for the use of a barge detained that way ?

Mr. McLennan—About \$1 per 1,000 bushels per day.

General Newton remarked that there was a very large quantity of that kind of storage in Atlantic docks, and the merchants generally took advantage of it at the close of the season. The reason they did so was, that in New York, they can only charge so much a day, and they considered by lying there they saved so much.

Mr. McLennan said, that the fact was, that allowing the grain to lie in the barges was a cheap way of storage. You cannot provide storage in any other way that is as cheap.

General Newton—In that case it is better to have a surplus of barges?

Mr. McLennan—That lies at the bottom. We can afford the difference, in short we can construct a barge cheaper than they can construct a warehouse.

Mr. Bell—As a consequence of that, in case of an increase of grain trade you could meet it by barges?

Mr. McLennan—Yes, sir.

Mr. Bell asked a question with reference to the detention of general merchandise in the sheds of the regular lines?

Mr. McLennan—I did not assume that was the case. My experience was, that there was an arrangement with a carter, and he takes every package when it is discharged. That was the system in olden times. I had a carter that received all the goods from the different ships as they were discharged, and he was supposed to take care of them. If there was only one package discharged in the evening he was supposed to move it, if he did not, he was liable to censure.

General Newton—Actually, you have no use for storehouses for general goods?

Mr. McLennan—No, sir; all the regular lines of steamers have sheds to protect all these goods from the weather, and the merchant is supposed to remove them very promptly.

Mr. Bell—Goods going West?

Mr. McLennan—And for the city.

Mr. Bell—In making basins, suppose that a basin may be made in any way—it is proposed to make one here, and here, and here—presuming there is a basin here at the upper end, do you consider it is necessary to lock the steamers up to the level of the Lachine Canal, or lock the boats down to the level of the steamers?

Mr. McLennan—The advantage of the high level, of course, is that it would remove you from the ice. For the general trade that we run now it makes no difference. I assume that a barge can go down more conveniently than a steamer can go up.

Mr. Bell—Basins would be an advantage?

Mr. McLennan—It would benefit the coal trade more directly than any other trade.

Mr. Bell—Do you not think it would be an advantage in a port like this, where the increase of trade is certain, to do something in the way of securing ground at both ends of the city, to provide for the increase of the trade?

Mr. McLennan.—We have 130 acres there (indicated) in shoal water, and there is a large amount in Hochelaga Bay also. It is said to be in some six or seven feet of water; that is better than land, inasmuch that it can be dredged to make slips, filling the pier with the material removed from the slips.

(The map of Hochelaga Bay was exhibited.)

Mr. McLennan continued—We ought to accommodate the lumber trade to the fullest extent. It is easily diverted; it has come here because they can do it cheaper than in Boston. It gives a good return and we can certainly afford to give it accommodation.

Mr. McLennan further said, in this respect, that with additional accommodation there would be a corresponding increase in the trade.

Mr. Bell—You do not see much advantage in raising the ocean vessels to a level with the Lachine Canal?

Mr. McLennan—The question would be, with ocean steamers, they will always seek the centre of the city for their points of discharge.

Q. Would it be a disadvantage to have them going further away?

Mr. McLennan.—The way I would answer that is, that this city business proper must monopolize the best portion of the harbour that is here within 2,000 or 3,000 feet. Another point worthy of consideration is that, in the volume of grain trade, a large number of vessels are brought out here to take the return cargo, and then accommodation could be at any point where you could get water room. Very many come with special cargoes and these you could accommodate a little outside when there is a crowd in the harbour. The point in my mind is, that you want to relieve the harbour of everything that you can set outside, and by so doing you accommodate the city trade to twice the extent it is accommodated now.

Mr. Bell—Then the separate trades requiring separate accommodation are lumber, coals, and vessels taking return cargoes?

Mr. McLennan—Yes, sir. If we increase the grain trade, there is a large volume of business of that description that would come here. Two years ago many chartered vessels came here, and the consequence was tonnage was cheaper.

Mr. Bell—They do not absolutely require separate accommodation; but it would be just as well?

Mr. McLennan—Yes, sir; and as a relief.

Mr. Bell—I mean these trades can be taken out of the rest of the harbour and specially arranged for?

Mr. McLennan—I don't think of any other point. As to getting general cargoes to the high level, there would be no great advantage except protection in winter. On the question of a coal depot here, it has to be considered how much the Government will do in the canal. I have always held that the Government can do something in this respect better than the Harbour Commissioners can. I think for the west end coal and lumber trade, the Government can provide for accommodating it at less cost than the Harbour Commissioners can do within the harbour.

Mr. Bell—By going up the canal basin and into the canal?

Mr. McLennan—And yet there is that 130 acres there. If we can utilize it, then you come to the question of conference, as to what extent the Government would be

willing to supply us with water. I think they would be willing to do it to a reasonable extent. It is a question of supply. If you have two locks there, 200 feet long and fifty feet wide, you take an enormous supply of water. Here is this slip (indicated), now in course of construction; here, for instance, is the pier projected to run here, the question would be whether there might be a high-level basin there with lock entering it, and the Government permit the supply of water to run down here. That would help to some extent, and perhaps we might have a dry dock, which is very much required.

Mr. Bell—Would you have a basin of water here?

Mr. McLennan—Yes, sir.

Mr. Bell—For water power?

Mr. McLennan—No; I think if you come to a question of water power, the Government would not entertain it.

Mr. Bell—There is another point that Mr. Watt spoke about. I did not understand what his views were. He said that vessels require to be in still water, and he would like them locked in preference to lying on the river level, because there is a rise and fall?

Mr. McLennan—I don't see any reason for that; the rise and fall is so gradual. I think he spoke in a general way. We have a point here, when you get down and place a vessel to receive grain, it is inconvenient to put the elevator and barge alongside, owing to the rapidity of the current.

Mr. McLennan further said, that the mode of extra accommodation must, of necessity, be a progressive mode. Here (place indicated) they might make a slip and pier, and so go on until the whole of the space was utilized. And the same way below. If the same mode is adopted for the lumber trade—that you supply six or seven slips and piers, and in the meantime go on increasing them as trade increases.

Q. Is it best to have sea-going vessels on a level with the river or the Lachine Canal?

Mr. McLennan—I don't see the advantage, unless you circumscribe the point spoken of. To get near the centre, you limit it to the principal wharves; then you have the disadvantage of throwing the other wharf accommodation distant and inconvenient of access to the city. I am speaking with reference to high-water basins here, and, I would ask, would you gain anything by involving such an enormous expense?

In answer to a question, Mr. McLennan said: The people in the vicinity of Monarque Wharf say, that the current is much stronger now than it used to be. Some of the people remember sailing vessels having gone up the current.

Q. Do you know if it was before the erection of St. Lamberts Wharf?

A. I fancy it would be before that. I am speaking generally.

Q. Do you know what that wharf (St. Lambert's Wharf) is used for?

Mr. McLennan—It is very little use; a ferry is run there.

Mr. Fleming—Could it be removed without detriment?

Mr. McLennan—Yes, sir.

Mr. Fleming—Does it belong to the Commissioners?

Mr. McLennan—No, sir; it belongs to the Grand Trunk Railway.

Mr. Fleming—You were speaking about raising the wharves to a level of the street?

Mr. McLennan answered this question by reference to Mr. Sippell's plan.

Mr. Fleming—What advantage is it to have vessels centered here (place indicated around new basins)?

Mr. McLennan—Well, we have not entered upon the business yet; I am a little conservative, and I don't think it is worth reaching out.

Mr. Fleming—Is there any particular advantage within the harbour?

Mr. McLennan—Nothing special in connection with our trade as a harbour; I am confining myself to the business feature of it; the ship-building interest is an advantage to any place—same as the manufacturing; but it is fairly a question of commerce; graving docks come directly into the question before us.

Mr. Fleming—We heard yesterday that flour could not be manufactured here for export to England?

Mr. McLennan—It is better to manufacture flour under the influence of the consumer; the men at Buffalo, Rochester and other places, receive orders for a certain brand of flour, and get for it the full price, and dare not let down the quality; it is always best to have the market for flour as near the consumer as possible; flour deteriorates in quality; wheat does not.

General Newton asked if that applied to Buffalo.

Mr. McLennan replied that they had an enormous local trade.

General Newton—Could not Montreal get up the same thing?

Mr. McLennan—We are not allowed; our millers have to make a uniform brand of flour. A miller at Lockport, for instance, getting a cargo of wheat, will make two-thirds of it first-class brand of flour, and compete in the lower brands with the remainder, and sell it as low as he likes; it is an outlet for low grade of flour; we have no such market here, and that is the trade throughout the United States; there is a difference of two dollars in each barrel of flour; there are some brands that will command two dollars, or two dollars and a half, and more for spring wheat flour, simply because of the reputation of the miller, and he keeps it up.

General Newton—If the trade was developed between Montreal and the Western States, then you could afford to go in and manufacture flour?

Mr. McLennan—It would change the complexion of things. Then I would say we want facilities now and we can pay for them, because from the export trade we can supply the trade to New England.

Mr. Bell—Then in case of that time coming, would it not be well to provide water power.

Mr. McLennan—With reference to that water power, the channel to give us the water power would cost so much in construction that it would make it so expensive, it would never be utilized. The Lachine Canal was constructed 25 years ago and Government sold the water power, and now we have only reached the full extent of utilizing the power. There were some mills not used until within a year or two.

Mr. Bell—You don't attach much importance to the water power, then?

Mr. McLennan—No, sir.

Mr. Bell—Still you would not recommend any improvements that would prevent obtaining it hereafter if the demand of the city so needed?

Mr. McLennan—No, I think not exactly. I think it would be well for you to get a little information on the water power that is in existence.

Mr. McLennan suggested Messrs. Gould, Workman and John Hall as gentlemen able to give information relative to this water power.

Mr. Fleming—I asked Mr. Henshaw and the other gentlemen relative to accommodation. Do you see anything amiss in their estimates?

Mr. McLennan—Except that they left out of account the fact that you don't require a double amount of accommodation to double the amount of trade. They seemed to assume otherwise—that if you had double the amount of trade in ten years you want double the accommodation. The same will apply to all branches of the trade. What I say is, the accommodation for vessels is too small, and that we want an increase promptly, so that if we grow up to that trade of two years ago, we shall have 25 per cent. additional accommodation, but it does not become necessary to do so indefinitely at that increase.

Mr. Fleming—Mr. Winn said in ten years, 50 per cent.?

Mr. McLennan—Well, that will be right. There is one thing to bear in mind that the trade of Montreal is largely in transit.

Mr. Fleming—You think your increase in trade must necessarily be trade in transit?

Mr. McLennan—Yes, sir; and what we want are facilities for rapid trade. These merchants want to be able to do their trade rapidly.

Mr. Bell—Do you think lockage would be an improvement to rapid transit?

Mr. McLennan—It would.

Mr. Bell—River steamers and general trade would be required to be locked up and down?

Mr. McLennan—I would see this matter easily provided for, if the Grand Trunk would be satisfied to move from the centre of the wharves. Then you provide a large amount of accommodation for city trade, and give other trades more room also.

In answer to a question with reference to the revenues of the harbour, looking to the Government assuming the channel improvements,

Mr. McLennan said, that it would not be safe to estimate on such assumption by

the Government. There was danger of diverting trade by the tariff. If the Government would assume the channel improvements, he would reduce the tariff and make it wharfage. He believed there was a large amount of trade passed us because of the dues. He would adopt small harbour dues.

Mr. Fleming—If a vessel passes through the harbour, do you get dues?

Mr. McLennan—No; in fact, if Quebec had enterprise, she could pass through the harbour and pay nothing at all.

Q.—Apart from Montreal interests altogether, what do you think of running barges to Quebec, and loading the ocean ship there, instead of bringing the ocean ship up here?

Mr. McLennan—You have got to take things as they are. I don't know but that has risen from the enterprise of the people. The trade has been localized here, and Quebec cannot interrupt it.

As an instance of this, Mr. McLennan cited Milwaukee and Chicago. Though Milwaukee was 90 miles nearer the eastern point, grain was lightered from Buffalo by Milwaukee to Chicago. It was the same thing here. A man might take a vessel to Quebec, but when he got there, he would find there was no wheat.

Mr. Fleming—Is it not because it is absolutely better to bring the trade here?

Mr. McLennan—No. They (Quebec) have got the timber trade; some gentlemen here said, why cannot we have it as well as they? Simply because they have already established it there. The whole system of trade adjusts itself to the whole question of trade as it grows up. There are certain things that might have been—that time has gone by and you cannot go back. For instance, Milwaukee might be Chicago, but the time has gone by.

Mr. Bell.—It is the same with the Clyde and Glasgow.

Mr. HICKSON, Manager, Grand Trunk Railway.

The Grand Trunk consumes 50 or 60 thousand tons of coal, and this will go on increasing. The present arrangements are very inconvenient, and add much to the cost—I suppose 40 or 50 cents a ton on landing. If we could bring the rails into connection with the vessels carrying the coal, that would be a saving; the landing is a considerable item upon such a large quantity of coal. There is a great waste of power in transferring goods from vessels to the rails; the wharves are awkwardly situated, running at right angles. If the rails could be brought alongside the ships, the goods for transportation could be taken direct on to the cars. In this respect I think the wharf accommodation very defective. The rails do not go sufficiently near the vessels; they run at right angles with the wharves, and near the abutment wall.

Mr. Fleming—What you would like, would be to get one spot for general use—a general depot with a basin outside and your rails running to the wharf?

Mr. Hickson.—That is one object in connection with harbor improvements, the rails should be brought into direct communication with the vessels to take away or bring in traffic. In that respect, as I have said before, the present arrangement is defective. Whatever changes are made, that is a very important matter that should be borne carefully in mind. The Grand Trunk Company are subject to a great deal of competition now for Western Canada traffic, and find it very difficult to hold it. It is going through by way of New York and Boston, through bills of lading are made and this item of landing and changes here is important in the calculations of the trader. It would be easy to extend the accommodation in the harbour, but the question of cost to the importer and exporter should be borne in mind with reference to the trade of the country.

Mr. Fleming—Did you mention, Mr. Hickson, that your coal came in ocean ships? I suppose you get some in vessels from Picton?

Mr. Hickson.—Yes; we get a great quantity from Picton and other places, but some also from across the Atlantic. I believe the larger ships you get to carry, the cheaper you get it.

Mr. Fleming.—It was said here yesterday, by a gentleman, that it was not desirable to have vessels in the coal trade that would draw more than about 18 feet of water. You are aware that the Government are making docks in the canal. Vessels drawing 18 feet of water would reach these docks. Would not a coal yard there (indicated) benefit you?

Mr. Hickson, being shown the spot, said—It would be a great convenience, and materially lessen the cost to us.

Mr. Fleming—The new docks contemplated would be close to your line of railway?

Mr. Hickson—I know the locality well. If coal is to be got up there, and access is to be obtained by rail, it will be a great convenience, and, as I said, lessen the expense to the Company, who, in all questions of accommodation, look to see if it will be suitable for all times to come. The present requirements of 60,000 tons will, in a few years, increase to 100,000, which takes a great deal of handling in the short seasons which we have. It would be a great object for the Company, in getting their supply of coal from the Lower Provinces, to have storage room where engines could run to coal.

Mr. Fleming—Is there any reason why it should not be got there? (spot indicated.)

Mr. Hickson—At low level you could not do it, on account of ice in winter. It must be at high level; the handling of coal two or three times would become a very serious item in using it.

Mr. Fleming—If you had a place where engines could run down and “coal,” there would be only two handlings?

Mr. Hickson—Yes. I am very much impressed with the necessity of having as cheap accommodation in the harbour of Montreal as possible. In any system which may be adopted, I think, in the interest of the carrying trade of the country, the work here should be done as cheaply as possible. There has been a considerable quantity of grain brought here and sent by rail to Portland. This will, no doubt, continue. There has been a large amount of grain for shipment at Portland put through the elevator at Montreal, owing to the break of gauge of the railway.

Mr. Fleming—Can you describe what vessels are suitable for transferring grain?

Mr. Hickson—It is a debatable point; but my opinion is that the discharging vessel ought to get to the elevators.

Mr. Bell—You would spout from the cars to the warehouse, and from the warehouse to the ocean ship?

Mr. Hickson—It seems to me an elevator will have to be built at the lower part of the harbour; if the vessels can lie alongside the wharf there (indicated), an elevator could be erected here (Quebec Barracks Wharf), on the upper ground, and the grain taken out of the cars and spouted down to the vessel at the wharf.

Mr. Hickson, in answer to further questions respecting grain brought by rail, said that it was so expensive a process, as to be almost prohibitory; first, the cars were run under the big elevator here (place indicated), then spouted into barges, and then spouted again to the ships by the floating elevators.

Mr. Bell—Your trucks discharge into the elevator?

Mr. Hickson—Yes, sir.

Mr. Bell—Then the elevator comes down to the vessel—that is the process?

Mr. Hickson—Yes, sir.

Mr. Fleming—Is there any other branch of trade to make special provision for?

Mr. Hickson—I don't think of any; well, yes, I think it is very important to Canada to obtain as much carrying trade as possible, and if you cheapen the facilities here, you help that object, and as I have explained, the harbour is inconvenient; in that respect something might be done, perhaps by putting turn-tables on the wharves, but I don't know whether or not that is practicable; I have seen it done in Hull, England; it is very inconvenient, having to cart everything, even such a short distance as is now necessary.

Mr. Bell—You go immediately to the ship on Allan's wharf?

Mr. Hickson—Oh, no. Of course, if you bring all the ocean vessels up here, you will increase the facilities much by putting down tracks close to where the vessels lie.

Mr. Fleming—Do you see any special object in bringing ocean vessels to the rails at the level of the Lachine Canal?

Mr. Hickson—Yes; and I think it quite possible to erect elevators there (place indicated). The connection with the rails and the shipping as it is now, is, no doubt, very inconvenient to the citizens, and causes much discontent. You know we run

over the canal bridge. We got permission to erect it after much trouble. The rails run through a very populous district, and it is, no doubt, inconvenient that whenever communication is wanted with the shipping at the wharves, the track has to be crossed. The Company has had to adopt the plan that, in case they have cars on the wharves, which they cannot load during the day, they bring them back and send them down again. We cannot leave them there without many complaints being made against us by those interested in the city traffic.

Mr. Fleming—Your main object is to get the track alongside the vessel?

Mr. Hickson—Yes, sir; and in as convenient a position as possible.

(Plan exhibited.)

Mr. Bell—This basin is supposed to be elevated. Would it make the slightest difference to the Grand Trunk Railway if it was down to the level of the Montreal harbour?

Mr. Hickson—My recollection of the position is, that the G. T. R. is on the level here. It is a steep incline on to the bridge. The approach is above the level of the surrounding ground. My idea is that the railway at Point St. Charles is not a great deal above the level of the water. We had a track down here to this pier and could soon put one down again.

Mr. Bell—Then you are on a proper level already?

Mr. Hickson—Yes, sir.

Mr. Fleming—On the low level wharves?

Mr. Hickson—No, sir; the proper level of Point St. Charles is the level of the G. T. R., but I cannot say how much. You could not have storehouses on the level of the wharves referred to.

Mr. Bell—You can have the storehouses by arching over and building stores above, or by putting them on pillars?

Mr. Hickson—You would greatly increase the cost of handling the traffic to and from them. There would be no objection to running down to one of the wharves at this point. There is a continual fight about getting into the harbor now.

General Newton—Up here, they would be out of your way?

Mr. Hickson—Yes, but should we not have to pass over some of the locks of entrances of the projected canal basins?

General Newton—No, sir; here are the basins of the present canal. Here is your Victoria Pier?

Mr. Hickson—The coal traffic could be accommodated, it appears to me thus, if the railway could be got down to Mill street and out on the outer wharf. You could store a good deal of coal there. There it would be convenient to handle, because we could take it out of the vessels into the cars. Persons in the general trade should be accommodated as much as possible also.

General Newton—It is thought by some, your coal could be deposited here

(indicated). To take it away from the harbour would be a great convenience for the work of the harbour?

Mr. Hickson, in reply, said there could be no doubt of that, and in regard to the general subject, said any expensive scheme which would put a tax upon the route, would undoubtedly prove very disadvantageous to the carrying trade of the country.

In answer to a question with reference to the Mill Street dock:

Mr. Hickson said, they had means of getting there, and he understood the proposal was that there was to be a wharf along the river side.

Mr. Fleming—Where?

Mr. Hickson—Mill Street. You first have a wharf on Mill Street, then a basin, then wharf outside again. The outside wharf would probably have to be the one for the railroad company to get to for coal.

Mr. Fleming—You might have access to it this way?

Mr. Hickson—But it might be difficult for us to get down this way; we might have to ask you to take off the corner of the dock.

In answer to General Newton,

Mr. Hickson said, there is no doubt the railway in the harbour is inconvenient, and creates much irritation. It is always an inconvenient thing to work a railway through a crowded city. It must be borne in mind that the vessel which brings traffic for the inland carriers, carries traffic also for the city. The city traffic along this side of the harbour must, to a great extent, remain. It is difficult to see how you can prevent altogether the carting of inland goods on the present harbour wharves. There is, of course, the system of turntables, but I should doubt if that was practicable in a crowded harbour like this, but the evil might be much lessened.

Mr. Fleming—If the coal and lumber was taken away?

Mr. Hickson—It would remove a great deal of carting off the harbour; 60,000 tons of coal alone requires a deal of handling

MR. MURRAY, representing the Canadian Shipping Company.

We have all along had great difficulty in getting accommodation for our ships; the accommodation in the harbour is quite inadequate to the quantity of trade. The dues in the harbour I consider quite too high already, and any increase in them would be very injudicious.

Mr. Bell—We would like to know what accommodation you have at present; if you have any suggestions to offer in regard to any alterations that you think should be made?

Mr. Murray—I have not looked into the plans. I think, in any alterations in the harbour, it would be wise to keep in view the impracticability of moving ships that are ship-berthed, and provide so as to have them load and unload at once. It is a great disadvantage to have to move vessels to take in cargo, because you have to keep a portion of it in, besides vessels will not stand without weight in them.

Mr. Fleming—What size are your vessels ?

Mr. Murray—Our vessels are from 900 tons to 1,300, and the steamers 2,200.

Mr. Fleming—What do they draw ?

Mr. Murray—When loaded 21 feet water with their coal, without their coal 19 feet 6.

Mr. Bell—Do you find it a suitable size ?

Mr. Murray—Convenient size.

Mr. Fleming—Not likely to be increased ?

Mr. Murray—We would enlarge them if there was more water. As the channel is now, they are quite large enough.

Q. Have you to take some of the cargo out at Quebec ?

A. In midsummer, I think, ocean going-vessels should have accommodation as near the centre of the harbour as possible. Our vessels are berthed below the harbour and we have to allow a reduction in freight.

Q. Does it make much difference ?

A. We have to allow about 1s. a ton.

Q. What pier have you at present ?

A. We have the Bonsecours Pier.

Q. Near what limits do you think the ocean-going steamers should be placed ?

A. I should think they ought not to be placed below Victoria Pier, and up to the entrance of the Lachine Canal.

Q. You consider that the best position for vessels ?

A. For vessels bringing mixed cargoes for Montreal and the West.

Q. What do you think about the level of the water ; supposing basins to be made, would you prefer the low or high level ?

A. It would be an advantage to have permanent sheds.

Q. Yes ; but irrespective of that ?

A. It would be very little, as there is no object in running out to this point; unless you erect large grain elevators ?

Mr. Bell—That is not what I mean; suppose that basins are made in any part of the harbour; one plan is to lock them up to the level of the canal, another plan is to let them go direct out to the river; the special disadvantage you say for the low level is, in not having sheds ?

A. Yes, sir ; and being flooded early in the Spring.

Mr. Murray instanced the fact, that four years ago, vessels had to lie out in the river ten days, on account of the wharves being flooded. He continues—If the locking accommodation was large enough and sufficient; I don't see any disadvantage in locking them in and out; many of the wharves here (King's Basin) are useless.

CAPTAIN RUDOLF, Harbour Master, next appeared :

Mr. Bell—Can you give us any information about the harbour ?

A. I think I ought to know something about it, I have been fifteen years Harbour Master, and fifteen years previous I was engaged as master of one of the passenger steamers between this and Quebec, so I may say it is thirty years since I commenced here.

Q. You have been master of a vessel ?

A. I have been master of a vessel six years previous to that. The harbour was very small 20 or 30 years ago, it only extended from the canal to the Merchants wharf, which was generally occupied by sea-going vessels. Where the Merchants wharf now stands, little jetties projected out very small in size, occupied by small vessels (river craft) with wood, brick, sand, &c.

Q. When was the Victoria Pier built ?

A. The Victoria Pier was commenced in 1861 and finished in 1863. The Victoria jetty was built some years previous; the Victoria Pier is 700 feet long and 100 feet wide, and sunk in 20 feet of water, it affords excellent accommodation for vessels of large tonnage and heavy draught of water, it runs nearly parallel with the shore. After that pier was completed the Commissioner's wharf was projected, and put down in 20 feet water.

Q. How are the present wharves occupied, commencing from the Lachine Canal downwards.

A. From the Canal to Wellington Pier (called Queen's Basin) is occupied by the Montreal Mail Steamship Company, also the whole of Wellington Pier by the same company. The next is Melcalf Basin, the north side and the whole of Russel Pier is occupied by vessels of all descriptions from sea; the next is the Elgin Basin occupied in the same manner; next the Island wharf and King's Basin in like manner; next the Merchants wharf occupied by Dominion Line of Steamships; next Princess Basin occupied by London Line of Steamships; next the Richelieu Pier, chiefly occupied by the Richelieu and Ontario Navi-

gation Company's Quebec Steamers; next a boat basin; then Jacques Cartier Pier and Market Basin, this basin was dredged to 20 feet two years ago, and cribs sunk to 20 feet along the East side of Jacques Cartier Pier and along the North side, this is now occupied by a large class of sea-going vessels; next the Bonsecours Pier, which was put down in ten feet of water, the West side is occupied by the Union Navigation Company's Quebec Steamers, the south end by the Laprarie Ferry Company, and the east side and all the Bonsecours Basin (which follows) is occupied by the market steamers; next the Victoria jetty, occupied by wood, sand and brick barges; next the Victoria Pier occupied by the largest class of sea-going vessels; next the Military wharf, which has been occupied by lumber, wood, brick, sand and hay barges, but is now being renewed, and cribs sunk in 24 feet of water and the basin dredged to that depth so as to accommodate the largest vessels that should come to the port; next is the Commissioners wharf which is 1,250 feet long, the west end is occupied by the Canada Shipping Company's Steamships, and the remaining part by large vessels laden with railroad iron, coals, &c; the next is the new basin built two years ago 360 feet long, and dredged to 20 feet, not yet named; the next is a new pier finished this year, it is 300 feet long about 150 feet wide and sunk in 24 feet water, not yet named; next is a new basin finished this year 300 feet long and dredged to 24 feet, not yet named; the next is Monarque street wharf, sunk in 10 feet, occupied by lumber and wood barges, and which is now extended down to Longueuil ferry wharf, in the same depth of water. From the Longueuil ferry wharf to Hochelaga the wharf has been extended and sunk in 24 feet water and occupied by vessels carrying coals and lumber. From the Hochelaga wharf to the wharf opposite Hudon's Cotton Factory there is an open space of about 1,000 feet, and the wharf opposite the factory is 153 feet, running out from the shore, and 153 feet down the stream.

Q. Do you think there is sufficient accommodation for the traffic?

A. No, sir.

Q. Would double the accommodation do for the present?

A. Yes, sir; never saw business so dull as it has been the present season.

Q. You say, to give your shipping sufficient accommodation, you should have double the accommodation you have at present?

A. Yes, sir; that is my opinion.

Q. When would it be necessary to increase that again?

A. I am of opinion that the trade will grow rapidly, and think a plan should be adopted so as the extension could go on as the increased trade required. I

think the scheme of the docks on the high level would be an excellent one, if not too costly.

Q. That contemplates the raising of sea-going vessels to the high level?

A. Certainly, but that would not accommodate the whole of them. Our trade is a peculiar one, and requires great space, as the grain comes into the harbour in barges, and is then removed from the barges by floating elevators into sea-going vessels.

Capt. Rudolf produced a plan, drawn by himself, which he explained, and continued:—The Island shoal is a great obstruction to harbour improvements, and in my opinion should be removed at once, and the whole harbour from Victoria Pier to Windmill Point should be cleared and dredged to 24 feet. Vessels could then come into port and anchor opposite the city until berthed. The wharves, from the Lachine Canal to Victoria Pier, along the front of the city, could be extended at any time without interfering with the present wharf accommodation, and vessels whose outward cargoes were altogether grain, could load as well in the stream as alongside the wharves. If a wharf was built 500 feet outside of Windmill Point wharf up to Point St. Charles, and 200 feet wide, it would afford excellent accommodation for vessels with coals and railroad iron, and with that width of basin the largest vessels could swing at the upper end, and sail directly down the harbour, and if a breakwater was built from the outer end of the embankment of the Victoria Bridge down to the shoal of rocks that is almost always visible (about 5,000 feet), and built as high as the embankment at the Victoria Bridge, the harbour would be free from current from the Victoria Pier to Point St. Charles, which would be a great advantage, and Point St. Charles made an excellent winter harbour.

Q. Then I understand you would send all vessels with railroad iron and coals to Point St. Charles?

A. I would send all vessels with railroad iron for the west to that point, and all vessels with coals, excepting those that had coals for the factories, &c., &c., to the east end of the harbour, and small vessels with coals for the city.

Mr. Fleming—It strikes me the Victoria Pier runs too far out?

A. I think not; I don't think the current is any stronger at that point now than it was before the pier was built. The current strikes it about 200 feet from the lower end, passes round the lower end, and strikes the Commissioners wharf about 600 feet from the lower end, then downwards.

Q. Where is the strongest current?

A. The strongest current is in St. Mary's rapids, opposite the gaol.

Q. Has the current increased or decreased in velocity?

A. I don't find any difference.

Q. It is said, by some people living about there, that it has increased ?

A. I don't know how they ascertained that.

Q. They said sailing vessels used to go up with the easterly wind ?

A. So they do now ; I don't know by what means they ascertain such things. I know the steamers that ply between this and Quebec do not find any difference.

Q. Can you tell us how the ice acts ?

A. The ice first forms in the basins opposite the city, as it grows colder, it forms on the river and moves down with the current and jams at the islands below Sorel and becomes stationary, first at that point, as the ice increases and moves down it continually adds to that part that is stationary until the river is completely blocked up as far as the Lachine Rapids. When the ice first stops at the islands below Sorel, and the river fills within, the water gradually rises, and by the time the ice reaches the Lachine Rapids the water is up to within a foot or two of the revetment wall and about 13 feet over the wharves and sometimes over the revetment walls. It will then shove for a day or two, pack very closely and become stationary, and in a day or two the water will gradually fall, it is then sufficiently strong for teams to cross. It generally reaches its lowest point about the middle of March.

In 1865, on the 3rd April, the water was two feet over the revetment wall, and up to Custom House Square, all Griffintown was flooded. I went in a small boat from the Bonsecours Market along Commissioners and Wellington Streets to the canal and returned. On the evening of the 4th of April the water began to recede, at 6 p. m. it was level with the top of the revetment walls and then fell rapidly.

The winter of 1874 was a very severe one. On the 24th March some people were cutting ice in the harbour about 150 feet outside the Russel Pier. I measured it, and found it to be three feet thick clear and solid, and when the piece was taken out I dropped the saw that was used in cutting the ice into the water, and it stuck in the frasil, (or anchor ice) about two-thirds submerged.

Q. Where does the ice commence to break first ?

A. Between the Lachine Rapids and the Victoria Bridge.

Q. What part do you see clear water in first ?

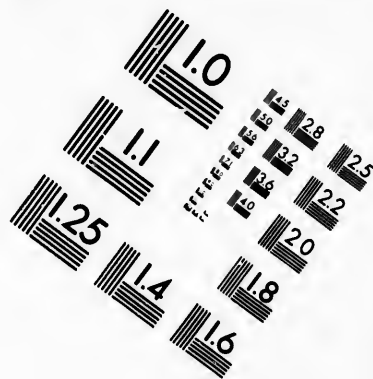
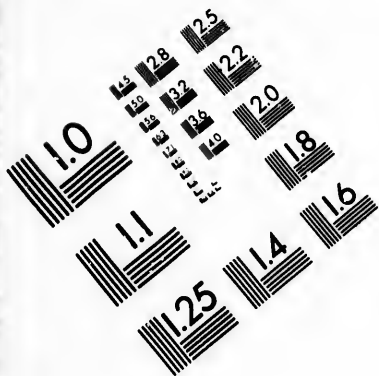
A. Near the Victoria Bridge.

Q. How does the ice generally move off ?

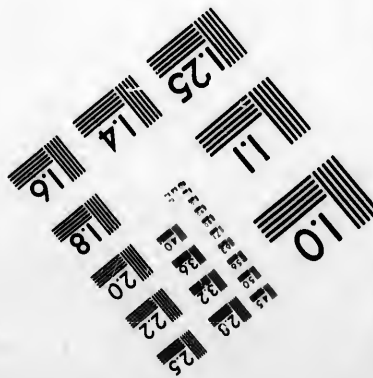
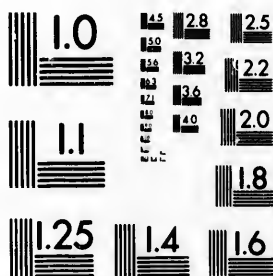
A. I have never seen it move off two years in the same way.

Q. But there must be some general resemblance ?

A. The moving of the ice altogether depends upon the height of water, force and direction of the wind, and temperature.



**IMAGE EVALUATION
TEST TARGET (MT-3)**



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Q. Is that wharf at St. Lamberts much of an obstruction?

A. I think not, because, when the ice begins to move down the water is then very high, generally 10 or 12 feet over the wharves, which carries all the ice clear of the wharves, and a large body of ice and water passes down the south side of St. Helen's Island, and there are also several water passes through the wharf, that extends from the main shore to Moffatt's Island, which relieves it very much. That wharf has been substantially built, but is now going to ruin. When the ice is breaking up and moving downwards, the obstruction takes place below Longueuil, at the Boucherville Island. There it jams, dams up the water, and throws it back, which causes the flooding of Griffintown. The obstruction cannot take place at Mouton Island, or near St. Mary's rapids, as St. Mary's rapids are not frozen over eight winters in ten. In six or eight days after the ice first begins to move, we have the river clear of ice as far as Sorel. The Richelieu River is open six or eight days before the St. Lawrence ice begins to move. This, I think, is caused by the warm water coming down from Lake Champlain.

Q. When was King's Basin built?

A. The wharf now called the Island Wharf was originally an island, there was a jetty built in 1835 connecting the islands with the main shore, which now forms the King's Basin, that forms the starting point.

At the conclusion, Capt. Rudolf furnished the Board with a detailed statement of tonnage, &c., &c. It is of record in his office.

MR. THOMAS WORKMAN, M.P., of FROTHINGHAM & WORKMAN,
Merchants.

MR. THOS. WORKMAN appeared before the Committee at their request.

Mr. Bell.—We want to get all the information you can give us.

Mr. Workman.—In reference to the enlargement of the harbour, or any new plans?

Mr. Bell.—Whatever you have to say about the harbour. You know a great deal about the water power?

Mr. Workman.—I know something about the water power on the Lachine Canal.

Mr. Fleming.—Our object is to get as much information as possible, in order to discover the requirements of the trade of Montreal, with a view to recommending some mode to meet the present requirements as well as the future to some extent. We have got a deal of information from members of the Board of Trade, and we were told you could give us a good deal of information particularly with regard to the water power?

Mr. Workman.—I doubt it very much. I have a knowledge of the water power on the Lachine Canal, Frothingham & Workman being lessees of water power at St. Paul's Lock. It is very regular there in summer, but in winter it is intercepted by ice. We have there now, five or six factories. The amount of water has been very much increased of late years by the new supply lock at Lachine, and the interruptions that formerly took place at regular intervals have to a considerable extent decreased. The supply has been more regular and satisfactory for the last three years than it was before; but even now when the weather is cold, it is interrupted occasionally for two or three days.

Q. What are the interruptions?

A. It is the "freize," a peculiar kind of ice formed under water, which flows in and chokes the supply. Mr. Keefer gave an elaborate report on this "freize," It is peculiar to the St. Lawrence, near Lachine Rapids, in the open water where it is not frozen over; when the temperature gets below zero it forms very fast under water and chokes the current.

Mr. Fleming.—But you have to mill in the winter?

Mr. Workman.—Yes; these interruptions have not been so frequent of late. The additional supply has added largely to the volume of water. The rock excavation where the channel was narrow has been enlarged, and consequently the supply of water is larger. Our men used to complain a great deal, but for the past two years they have complained very little.

Mr. Fleming.—I think the chief object of enquiry at the present time, is the desirability of additional water power—whether it will be worth the cost?

Mr. Workman.—I am rather heretical on that point.

Mr. Bell.—But we want information?

Mr. Workman.—I suppose the object in view would be, to make large manufactories here, and supply them with water power.

Mr. Bell.—Our object is to find out what the city wants; do you think it desirable to extend the water power very much, provided the cost was not excessive?

Mr. Workman.—Yes; if the cost is moderate, I think it advisable; but at present here is quite as much water power as the trade really demands. Of the different factories, I think not over one-half are running full time, and the other only working half time.

Mr. Fleming.—That is this year?

Mr. Workman.—Last year they worked full time.

Mr. Fleming.—At any time have your factories been fully occupied?

Mr. Workman.—Yes, sir.

Mr. Fleming.—Then there was a demand for additional water power?

Mr. Workman.—Since my firm have been interested in that water power, we have never been able to lease all the water we have there. We have water power to spare to-day, and are willing to lease, at what we consider a moderate rent. Perhaps if this water power had been in possession of people a little more needy, they would have succeeded in letting it, but we have waited. We have a perpetual lease, I believe, from the

Government, renewable every twenty-one years, of the surplus water at St. Paul's Locks, and we could, to-day, lease sufficient to drive 20 run of stones. The whole power was supposed to represent 48 run of stones, but it has been increased lately.

Mr. Fleming—How much are you using?

Mr. Workman—Little more than half. There is a spade and shovel, axe, scythe, nail and auger factories, and a large flour mill.

Mr. Fleming—Let me draw your attention to the plan on the wall there, a gigantic water power scheme?

Mr. Workman—That is just at the rapids; is it something new? That is St. Lewis hydraulic power; I don't think it is necessary at present.

Mr. Fleming—Do you think it likely to be necessary?

Mr. Workman—In half a century, or a century hence. We must enlarge our market first. The great drawback here is the want of a market. This plan was gotten up by a private company. No doubt it is a splendid power. If we had a market all could be utilized; but there is the subject of cost; if we had cheap labour and 40 millions of people. Labour is probably cheaper here than in the United States in ordinary times, but not this year. There are now more idle people in the United States, in proportion to the population, than there are in Canada, but that is the exception, not the rule. Of course, Mr. Fleming, this would depend upon cost and the return made. I would be decidedly opposed to go into any unnecessary expenditure unless you see a way to a fair return for the capital.

Mr. Fleming—But you would not advise the adoption of any harbour scheme that would render it impossible to carry it out in the future?

Mr. Workman—No, sir; I would not; I think that is one of the most feasible schemes. There was another which Mr. Young proposed which, I think was rather Utopian. What would this water power be employed for—what branch of industry.

Mr. Fleming—It has been said there is not much demand for flour in England—that they prefer wheat?

Mr. Workman—As a rule, they prefer wheat. There is a demand for flour just now from Scotland, but it is only temporary. I think the facilities for manufacturing in and around Montreal are more than equal to the requirements of trade at present.

Mr. Fleming—Can you form any estimate in your own mind of the requirements of the trade ten years hence?

Mr. Workman—No, sir; unless judging by the past. There has been a gradual and progressive improvement. For the last fifteen or twenty years, it has been great, but has met with a check.

Mr. Fleming—We are aware there are temporary reverses, but these need not be considered now?

Mr. Workman—Still these reverses are cropping up every seven or ten years, and I think they ought not to be overlooked. They continue for two or three years, then commence six or seven years of prosperity, when the reverses again come round.

Mr. Bell—But, on the whole, the progress is in the right direction ?

Mr. Workman—No doubt of that—there has been an enormous increase in material wealth and commercial prosperity.

Mr. Bell—Trade simply takes a rest for a year or two and then goes on again ?

Mr. Workman—Yes, sir.

Mr. Fleming—Look at the body of water in the St. Lawrence, and the progress of the city ; don't you think it advisable to preserve some means of utilizing that water power when it is required ?

Mr. Workman—Yes, sir.

Mr. Fleming—If it can be done, to secure the land at least ?

Mr. Workman—If it could be done at any reasonable expense, I think it ought to be ; but it is a question of return for capital invested.

Mr. Fleming—If that part of the town were built over, would it be possible to secure the land at any reasonable cost ?

Mr. Workman—No, sir.

Mr. Fleming—It would be more difficult to get it ?

Mr. Workman—Yes ; if Montreal makes the same progress in the next 50 years that has been made in the past 50 years, it will be a town of 500,000 inhabitants.

Q. Do you think the wharf accommodation sufficient for present requirements ?

Mr. Workman—It has been sufficient, with the exception of a few days in Spring and Fall. Look at to-day—it will accommodate three times the trade that it has. It is better adapted for the trade of Montreal than Liverpool is for the trade of Liverpool. I have seen vessels loaded over each other once or twice here ; but in Liverpool they load frequently three or four deep, so crowded is that port. It is all-important to give vessels dispatch. If a vessel can come here, discharge her cargo and take in another in five days, you only want half the accommodation you would if she took ten days ; she makes room for others so much sooner.

Mr. Fleming—The ships are despatched quicker now than they were ?

Mr. Workman.—Much quicker ; and the means of loading and unloading are more rapid. Formerly, it was all done by hand ; now, it is done by steam. I have known vessels come in here, unload and load large cargoes, and be off in five days ; large steamers have come in and discharged full cargoes, take in 2,500 tons, and cleared in three days at Allans' Wharf.

Mr. Bell—Taking into consideration future requirements, do you think any improvement can be made, and to what extent ?

Mr. Workman—That is a point upon which I would rather not give an opinion ; I have not given it much thought. It is in the hands of the Harbour Commissioners, and I know they are giving it their best attention. There is not the amount of confusion nor the same trouble with missing goods there used to be ; not one case now where there used to be three. If this mixing occurs, it is through the carelessness of the officers or employees of the ships. There is no doubt, when the harbour is crowded, goods get mixed,

and it is also difficult to get at them, but that does not exist to the extent it is represented. The sheds are a great convenience and advantage.

Mr. Bell—How would it be if stores were so erected, that the goods could be elevated into them at once ?

Mr. Workman—That would revolutionise the whole business of Montreal. It would be a matter of accommodation, but might be attained at too great expense. We are an economical people here, as a rule.

Mr. Bell—If you had stores alongside the vessel, and at once discharge vessels into the stores and out of them on to trucks, you would save cartage ?

Mr. Workman—Certainly ; but then another question crops out. You are probably acquainted with the power of ice ; the construction of stores will be attended with a great deal of danger. I remember seeing a large four-story stone store, near the Custom House, in 1836, struck by ice and levelled to the ground ; and in a smaller house, a family of five persons buried in the ruins so firmly, that it took fifty men two days to get out the dead bodies.

Mr. Fleming.—Did the ice strike the first floor or the second ?

Mr. Workman.—I think it struck five or six feet from the ground.

Mr. Fleming.—Could that occur again ?

Mr. Workman.—Scarcely ; because the abutment wall was not built then ; the force of the ice is now broken by the piers of the Victoria Bridge, but I have seen it strike against that wall and drive it in. The ice has not piled up so high on the wharves since the Bridge was built.

Q. How do you account for that ?

Mr. Workman.—The abutments screen them ; formerly it came down with the whole force of the Lachine Rapids.

Q. The old pilots say the current is stronger now than it used to be at St. Mary's ; do you think that since the erection of the pier (St. Lambert's wharf) has had anything to do with this ?

Mr. Workman—I don't know ; it might increase the current on this side ; but I don't think so.

Q. Whatever may be the cause, they say the current is stronger.

Mr. Workman—The cause is this : part of the river has been narrowed by building the new wharves ; a great volume of water has to come down ; and if it formerly had 1200 feet to pass through, and now only 1100, the current will be stronger, of course.

Q. But they have given greater depth to the current ?

Mr. Workman—The deepening might increase the flow, and give it some velocity.

Mr. Bell—Will you show me where the ice breaks first in Spring ?

Mr. Workman—In coming down, sir ?

Mr. Bell—Where is the first break ?

Mr. Workman—More on the south side than the centre ; I can see it out of our win-

dows ; I have always watched for the first clear water, and it appears generally about in this direction, within half a mile of the south shore above St. Helen's Island.

Q. Suppose we have store-houses up here, and the water enclosed in a basin ?

Mr. Workman—That would alter the whole harbour ; you would require a large parapet-wall here to prevent the ice from striking.

Mr. Bell—Suppose that were all done, and it was a well-protected basin, do you see any difficulty in putting up store-houses ?

Mr. Workman—No, sir ; I think it would be an advantage, but expense crops up again ; if it is burdened with additional wharfage, you will drive the trade away ; it is high enough now ; wharfage is driving a million of dollars of imports away from Montreal every year ; Upper Canada importers will not pay it ; they too often ship by New York.

Q. You must store somewhere ; would it not be best to concentrate them on the wharf ?

Mr. Workman—The question of cost comes up again. It could only be done at enormous expense, and you would be subject occasionally to Spring and Fall inundations. Your foundations would be under water for two or three months during winter and spring.

Mr. Bell—Yes, no doubt ; but that could be overcome. You consider it is a matter of expense and wharf dues ?

Mr. Workman—If it could be done at an expense that could present a reasonable return for the money, I would say do it.

Mr. Bell—You think it desirable to limit the expenses to the harbour ?

Mr. Workman—I think it all important not to burden trade with any additional harbour dues. At present they are as high as we can bear. I am a director of the Canada Shipping Co. We get letters often from our agent in Liverpool, stating that he cannot get dry goods for our steamers coming here ; in consequence of our high wharfage they were going round by New York. A half ton of fine silks recently cost over \$100 wharfage—such goods pay $\frac{1}{4}$ per cent. ; they go to New York by steamer, where there is no wharfage, and are sent on to Western Canada, I suppose. Heavy and bulky goods, such as iron, crockery, etc., come this way.

Mr. Bell—Then, in New York, are these wharves the property of the Government ?

Mr. Workman—I cannot correctly answer that question ; I was under the impression that they had to pay high wharfage there until lately ; here the wharfage is a burden to the importation of dry goods ; you see $\frac{1}{4}$ per cent. on dry goods, more than balances the extra expense of freight by New York. This is a subject to be taken into consideration. The trade of London, England, is overburdened by town and dock dues, and wharfage.

Mr. Bell—Still they go on and prosper ?

Mr. Workman—There they have an enormous population, and the concentrated capital of the world to provide for. There is no doubt, that this plan of building stores is a grand idea, and I may not look at in a proper light ; but I don't think you can make it pay as an investment. The Government might make Montreal a splendid harbour ; but they cannot do it as a Government work, I presume.

Mr. Bell—Do you consider the present wharfrage is a bad arrangement ?

Mr. Workman—The wharfrage is very good for a certain class of vessels, but not so good for others.

Mr. Fleming—Do you think it advisable to take some of the trades such as coals, pig iron, &c., &c., and accommodate them in another place ?

Mr. Workman replied that the further it was taken away, the higher the cartage would be—probably thirty cents a ton extra on coals, pig iron, &c.

Mr. Fleming—If taken to Point St. Charles ?

Mr. Workman—That would increase the cartage very much. There would be a difference of twenty cents a ton in favor of this side of the Lachine Canal, as compared with the south side.

Mr. Bell—Suppose you had it on the new canal basins ?

Mr. Workman—That would do for that section of the town. Make it so that vessels drawing 18 feet of water can go up there. This would answer very well, then there ought to be another coal dock to accommodate the east end of the city.

Mr. Bell—Do you think it advisable to have a central depot ?

Mr. Workman—No ; I don't think it is. The central position would be better occupied. If you can make all these improvements on the present harbour, they will be advisable ; but the trade cannot bear any additional wharfrage.

Mr. Bell—It has been said here, that it was important to have the general trade of the city done within certain points—Victoria Pier on one end, and Wind Mill Point on the other ?

Mr. Workman—It is of course important ; I know the Canada Shipping Company's steamers cannot get the same amount for freight as others, because they have to land below the barracks, and it costs ten or twenty cents extra cartage to bring goods to the city warehouses.

Mr. Bell—One gentleman went so far as to say that it would be better to have his goods landed at Quebec ?

Mr. Workman—That is a little too much.

Mr. WM. GUNN, representing the Grain Trade.

Mr. WM. GUNN next appeared before the Committee.

Mr. Bell—We are trying to get as much information as we can from all sources, and your trade appears an important one

Mr. Gunn—It is a large trade.

Mr. Bell—Will you be kind enough to give us your views upon the harbor and the accommodation that is in it, and the working of your trade ?

Mr. Gunn—Well, do you mean as regards the accommodation of the harbour, or as to the trade generally?

Mr. Bell—As far as your trade is concerned. We have got a good deal of information from other sources.

Mr. Gunn—I am familiar with the trade of the harbour by being connected with it for fourteen years; but I am more immediately connected with the grain trade at present, and can speak almost on any point that you wish information. As regards the grain trade, it is an extensive trade, and one that is capable of very great extension.

Mr. Fleming—Will you describe how it is now carried on, and how it could be?

Mr. Gunn—My views about the grain trade are these:—To compete with New York, Baltimore, Philadelphia and Boston, we have to keep expenses down to the lowest possible point. It is a close race at present, and in order to do this, we must get as great facilities as possible, as much at least as they have in New York. We must have plenty of room, plenty of water, and vessels of the largest class for the proper development of the trade.

Q. What size are the vessels in New York?

Mr. Gunn—The largest now built. We want the largest class of vessels you can bring here.

Q. Larger than the Allan steamers?

Mr. Gunn—They are large enough. We want all the water you can give us. I am satisfied that the larger vessels we can bring here, the more trade we shall be able to do. What we want is plenty of room to place them when they are here. I have seen, when there has been a pressure of work, vessels lie over ten and twelve days waiting for berth room. They should have room to discharge and load at the same time. We want a great deal of quay room in our trade. The accommodation is not nearly sufficient. Probably at this moment it is so, because there is a lull in the trade. The crops are not moving, and there is a reason for it. The season has been very late, and we shall not get much of the crop this year.

Mr. Fleming—Then there will be more to come next year?

Mr. Gunn—Yes, and I shall be prepared to see a great demand for accommodation.

Mr. Bell—What sort of piers and docks do you think there should be—basins or quays?

Mr. Gunn—We want wharfage room, where the vessels can lie alongside a pier and discharge inward cargo and load at the same time; and to do this, with despatch, there must be plenty of quay room for discharging on the one side,

and ample room for barges and elevator to go alongside on the other side, and load into her; it is very desirable to have frontage room to lay a vessel, and load and unload her at the same time.

Mr. Bell—Would it not assist that to have granaries on the edge of the quays.

Mr. Gunn—No; I am not at all in favour of that; I think it would be attended with altogether too much cost; grain will not bear handling in that way; you may be surprised when I tell you that the competition for the trade is so great, that half a cent. a bushel will turn the scale between here and New York, so that it is of the utmost importance to save every fraction, and cut down expense to the lowest possible point; I have seen orders pass us here for three-pence a quarter; three-pence a quarter will turn the trade here.

Mr. Bell—You think it will be no saving to have warehouses?

Mr. Gunn—Not at all.

Mr. Bell—Will floating warehouses suit you best?

Mr. Gunn—Barges are the only warehouses we require. If you talk over the handling of grain I will give you my views as to the most economical manner of handling the grain trade of the West—deepen the Welland Canal so as to admit vessels of a capacity of 40,000 or 50,000 bushels; break bulk at Kingston by a fixed elevator where the grain can remain a few days should barges not be ready to receive grain from lake vessels. There is an idea of bringing these large lake vessels through to Montreal. My views are entirely opposed to it.

Mr. Fleming—Where do these large vessels come from?

Mr. Gunn—From Chicago, Milwaukee and other Western grain centres.

Mr. Bell—Cannot they get right through the St. Lawrence?

Mr. Gunn—They will have to go to Kingston, at any rate.

Mr. Fleming—What is to stop them coming here?

Mr. Gunn—Insufficient water; and to bring them, an enormous outlay of money would be necessary in deepening the canal.

Mr. Fleming—Are they not doing so now?

Mr. Gunn—I think it quite unnecessary, but they are doing so; they are deepening the locks to 14 feet and 270 feet in length.

Mr. Bell—That is on the St. Lawrence Canals?

Mr. Gunn—On the Lachine Canal and others; in my opinion, it is a waste of money for a very long time to come.

Mr. Fleming—They are deepening the lower end of the Lachine Canal, and contemplate deepening the whole?

Mr. Gunn—We required the additional room at the lower end of the Lachine

Canal, but nothing more for many years to come. I was going to say the lake, river and ocean transportation should be three distinct branches. You cannot combine them in one. Vessels adapted to the lake trade are not adapted to the river, and those adapted to the lakes and river are not adapted to the ocean. My idea of the most economical way of conducting the grain-carrying trade is by bringing large lake vessels and propellers to Kingston, and then forwarding in barges of 15 to 20,000 bushels capacity to Montreal. These barges can go into any part of the harbour, and are much more economical and convenient than larger vessels. They are not costly, and can lie here, while a propeller of 40,000 bushels would cost \$100,000; to make them profitable we would have to keep them always running, which would be impossible. Therefore, by having a fixed elevator at Kingston, you could handle stuff promptly, and afterwards in boats adapted to load ships. It is desirable for the import trade to have the goods landed as high up in the harbour as possible; for the grain trade it makes little difference. I have handled several million bushels this year, and could have loaded in the lower part of the harbour as well as anywhere else. All that is required is room to place vessels, so that they can discharge cargoes and receive grain at the same time. Grain is the great bulk of cargoes last referred to. Such vessels as the Allan steamers take mixed cargoes, and load sometimes not more than one-third to a-half with grain. Take this last ship of their line, the "Sarmatian;" her carrying capacity is 20,000 barrels, and she carried, I think, about one-third of that capacity in grain. The balance consisted of butter, cheese, flour, &c. The Allan steamers carry the great bulk of this trade.

In answer to Mr. Bell, Mr. Gunn said that if the lake steamers break bulk at Kingston, they must have some store room there, although only to a very moderate extent, and attached to fixed elevators.

Mr. Bell—That is an important item?

Mr. Gunn—My idea is that it is necessary to break bulk at Kingston; put up an elevator of moderate capacity there, in order that these large propellers, when they come in, can transfer their cargoes promptly. I feel that it will never do to bring large lake propellers here.

Mr. Bell—Instead of breaking at Kingston, suppose you had stores here, and an elevator to carry the grain into the store, and then discharge it into the ship by spout?

Mr. Gunn—Of course it would be a great convenience if you could get the ship to the spout; but, in my opinion, it will be too costly.

Mr. Bell—It will at Kingston?

Mr. Gunn—No; because it will not go into the store, except in a case of

emergency, when barges are not ready to take it. A gale of wind from the east might keep forty or fifty vessels back for a week or ten days, which would all come in at one time. To provide for a time like that, I say, have a fixed elevator, and let the elevator spout it down to the barges, if ready, or the grain can lie there for a week or so, attended with little cost.

Mr. Bell said: that if the propellers went to Kingston, and the barges were not ready, they could come on to Montreal, if there were store houses here, and the canals made deep enough.

Mr. Gunn—My idea is the canals are well enough as they are, for five times as much as we are doing; they have capacity enough for five times the amount of business that has ever yet been done in them.

Mr. Fleming—Suppose the canals were deep enough for forty thousand bushel propellers to come to Montreal; do you think it desirable they should come?

A. No; it would be attended with too much cost; for this reason, a propeller that costs \$80,000, or \$100,000, is well adapted to the lake trade, and not the river; a barge that costs one-fifth the price will do the work better; therefore, why keep the costly boat to do it?

Mr. Bell—Why is it these barges should not go on to Quebec, instead of stopping at Montreal?

Mr. Gunn—I see no reason, except that trade is prepared for it here.

Mr. Fleming—If it is more costly to carry lake propellers to Montreal, is it not more costly to bring ocean steamers here?

Mr. Gunn—No; when the cargoes are in, I don't think it costs so much more to come on here if you have water enough to steam up.

Mr. Fleming—The reason you give why barges are cheaper than propellers, surely applies equally to ocean vessels?

Mr. Gunn—No, because the time is lost in the canals; while here you have an open river that you can steam up at full rate of speed all the way. There (in the canals) you take ten days to get here. Five days time with a costly steamer is too much to spend in canals, and besides, when you get them here, you have to break bulk by storing. Take a larger class of boat (the Allans') and you cannot deliver more than 10 or 15 thousand bushels out at one time, you have either to keep here (in the propeller), or move it to some other ship.

Mr. Bell—Or store it?

Mr. Gunn—Or store it; you cannot keep these propellers idle; you have either to put their cargoes in barges or into store.

Mr. Bell—Same reason applies to ocean vessels?

Mr. Gunn—I don't see it.

Mr. Fleming—Is there not much more capital invested ?

Mr. Gunn—The ocean vessels come here and discharge instantly, if there is wharf accommodation.

Mr. Bell—That makes a difference ?

Mr. Gunn—It makes it entirely different if they were simply engaged carrying grain ; it is entirely a different trade. Perhaps there is one party to handle the cargo of a propeller, and five hundred the cargo of the inward steamer ?

Mr. Bell asked how the butter and cheese came.

Mr. Gunn replied : that a great quantity came by rail.

Mr. Bell—What if the steamer is not ready ?

Mr. Gunn replied : that the steamship company took a large quantity into the sheds.

Mr. Bell—Would it not be better to have stores ?

Mr. Gunn—It would be desirable, if that class of goods could be handled in that way. At present, they some times leave it in the train. I think, as a general thing, it is hauled to the steamboat sheds as soon as it comes ; stuff for shipment is seldom warehoused.

Mr. Bell—Then suppose there were basins made, no matter where, up the river ; do you consider it would be better to lock the ships to the level of the canal, or lock the canal barges down to the level of the ships, keeping the quays a proper height above water ?

Mr. Gunn—Well, I think the ships would lie alongside the wharf at the level of the river. I see no objection. I don't see, however, where the advantage would be.

Mr. Fleming—Would they not be obstructed by the water rising over the quays ?

Mr. Gunn—Sometimes there is such obstruction.

Mr. Bell—It would be an advantage then to have a dry place for cargoes.

Mr. Gunn—But, in my experience, there is no difficulty with the wharves at their present height, except early in the Spring ; there are one or two places where the current is strong, and there is difficulty, but I think the vessels work very well at the level of the river ; what we want most, in connection with the grain trade, is plenty of quay room, and plenty of water ; when a crowd of vessels come in, the difficulty has been getting them berthed, and getting their cargoes out ; some years ago, I remember seeing vessels lying four and five abreast, waiting sometimes ten days for a berth.

Mr. Bell—Where do the barges lie ?

Mr. Gunn—In the canal, until they are wanted.

Mr. Fleming—Then these basins they are making will be an accommodation to the trade?

Mr. Gunn—Yes; I wish to impress upon you, that so far as the grain trade goes, I can assure you it will not bear storage charges; it must be transferred from barges to ships at the least possible expense; we cannot compete with other shipping ports, with the cost of storage added.

Mr. Fleming—You say you want plenty of accommodation; can you define how much you require for the present trade, that is, say the trade of last year, when it was brisk.

Mr. Gunn—As the trade is at present, of course, with the works in progress, I don't think we shall be very short of room, but what I look for is a largely-increased business with the enlargement of the Welland Canal.

Mr. Fleming—Suppose ten years hence; how much increase on the present accommodation do you think you will want?

Mr. Gunn—I should not be surprised to see the grain trade of Montreal three times what it is now.

Mr. Fleming—That would not want three times the present accommodation?

Mr. Gunn—No; because the trade is changing; a large proportion is done by steam now. A steamer comes in, and her time is too valuable to keep her; she must be handled promptly.

Mr. Fleming—Do you think about double the accommodation will be required in ten or twelve years?

Mr. Gunn—I think so.

Mr. Fleming—Would it be an unnecessary expenditure of money to provide for that?

Mr. Gunn—I don't think it is at all requisite at present, but will be in that time.

Mr. Fleming—Do you think the grain trade will be progressive?

Mr. Gunn—Yes, provided we can give it accommodation. The St. Lawrence is the favorite route, at the same price, for the reason is, that the water here is cooler; it does not attain the same heat as the Erie Canal, and grain goes through, as a rule, in better condition. It is the exception, when we have any grain *starting sound* from the west, to go out of condition; whilst we must say it is the exception for grain, by way of Erie, to get to New York without some deterioration during the heat of summer. The boats on the St. Lawrence are so constructed that, from one-half or three-fourths to seven-eighths, or a very large proportion, is under water; whereas, in the Erie, the largest proportion of the boats is above water. The English merchant says, at the same price we prefer grain by the St. Lawrence, for the reason that it comes through in better condition. I think, if we could put the trade on a par with other ports, or offer a little inducement in price, it would increase the trade of the St. Lawrence enormously.

Mr. Fleming—Do you think it likely the grain trade can be doubled in eight or ten years?

Mr. Gunn—So long as the enormous tracks of prairie land in the west continue to be settled, so must the outflow of grain increase. There is no doubt it will increase materially for many years to come.

Mr. Bell—You say a great many ships are loaded without requiring to come to the quay.

Mr. Gunn—No, sir; what I say is, that they could be, but the great advantage of quay room is to facilitate the discharge of their inward cargo, and save time in loading.

Mr. Fleming—I understand you to say some vessels might go down to Hochelaga without coming to the wharf.

Mr. Gunn—I say a vessel loading with grain altogether could be loaded at Hochelaga.

Mr. Fleming—But she must have been to the quay to discharge her cargo.

Mr. Gunn—Yes, sir.

Mr. Fleming—Would it be a good thing to provide a basin alone for barges, to keep them out of the shipping?

Mr. Gunn—I think it desirable to have places for them. It would be desirable to have places for wood and coal, and such, separate—apart from general cargoes. There is a great deal of wood landed here in the neighbourhood of Victoria Pier at present.

Mr. Bell—There is a place at Windmill Point, that would be a good place.

Mr. Gunn—I think so. My impression is, that the coal trade is as yet only in its infancy, and if we are to supply a share of the western country; we shall require a good deal of accommodation to handle it.

Q. How much water does a 2,000-ton steamer draw?

Mr. Gunn—Nineteen or twenty feet. When I speak of 2,000 tons in the coal trade, I mean the outside. I am strongly convinced it will never be a desirable way of handling grain,—bringing these large propellers to Montreal; they are a great nuisance. Captain Barclay, who is here, will tell you they are not adapted to the trade of the port. I know they are a great nuisance to us, who have to provide for them when they come down. We get them now with only 12,000 to 15,000 bushels, and they must get away immediately, or they grumble. What would it be with three times the quantity?

Mr. Bell—They want the storehouse.

Mr. Gunn—Storage costs too much; with insurance, and everything taken into consideration, the trade cannot bear it.

Mr. Bell—There is no doubt trade is changing, so that any provision for the future must be made for steam.

CAPT. BARCLAY, Marine Superintendent Allan Line.

The accommodation for discharging and loading is, to-day, even less than it was seven or eight years ago, a large slice having been taken off our wharf for Railway purposes; while, during the same period, the steamships of the "Allan Line" have been greatly increased in numbers, length, and capacity. There is neither room for the ships or their cargoes when discharged.

The total frontage of wharf is about 900 feet, of which 165 feet at the western end, forming a kind of little dock, is almost useless, being too narrow to admit of elevator or barges getting alongside; consequently the ship has to be landed of said dock in order to lead the end which may happen to be at that place.

The remaining 735 feet is supposed to accommodate two steamships of 400 feet each in length.

As to the wharf space, it is altogether insufficient.

For nearly one-half of the length of the total frontage, the available space is only a narrow strip 65 feet from the edge of dock to the Railway embankment, in which place I am supposed to find room for the cargo of one ship, say 2,000 to 2,500 tons of goods.

We can, in a few hours, discharge inward cargo enough to cover the whole of the wharf allotted to the "Allan" steamships, from end to end, and must then either stop work, and wait until it is removed, or pile it up in a confused heap as best we can, and always experience great difficulty in finding a way to get the *outward* cargoes through, and over the *inward* to the side of the ship.

It is frequently necessary to dispatch a ship very quickly, in say 20 or 40 hours after arrival, in which case great confusion and loss of time, as well as great expense is caused by the want of room on wharf for cargo.

The "Allan" steamships require for dispatch and economical handling of cargo, length or frontage for three large vessels of say 400 feet each, and from four to six large barges, with corresponding space on the wharf for inward and outward cargo, which simply means about twice the space we are now permitted to occupy.

It would, in my opinion, be very desirable that the wharves should be raised, if practicable, as up to about the 20th of May of each year, a large portion of the "Allan" wharf is covered with water.

In the event of the harbour being converted into a basin, it would also, in my opinion, be much better to raise the water to the canal level; the wharves would then be so much higher above the river level, and so protected from ice, that permanent roomy sheds, powerful steam cranes and other appliances for handling and taking care of cargo, usually found in first class ports, could be erected.

The harbour would then be so secure that seagoing and other craft could, if necessary, find safe winter quarters. The sheds now used and owned by the "Allan Line"

have to be put up and taken down every spring and fall, which, with keeping in repair, planking public wharf (without which planking, it is only a mud-hole or gutter) involves a very large outlay of private means for public purposes.

I would beg to suggest, that the Docks or Basins—now in use for the general shipping of Montreal—should be greatly enlarged; they are now much too small. “Met-calf” Basin, for instance, should be not less than 300 to 350 feet wide, and the length of each Pier 550 to 600 feet, which would afford ample room for five large sailing ships, with their Elevators and grain barges, and leave a wide passage in the centre of the dock for traffic to and fro.

As for depth of water in the Basin or Channel, it is enough to state that, from about the end of May or June, until the close of the navigation, two-thirds of the

Allan Line” are obliged to leave Montreal only half laden, and in many instances only quarter laden, the balance of their cargoes having to be sent to Quebec in barges. The same thing occurs with regard to the inward bound steamers, they have to lighten and trim at Quebec, in order to come to Montreal.

During the time referred to above, their draught varies from 18 to 19 feet 6 inches. When fully loaded and ready for sea, they draw 23 to 26 feet.

THIRD DAY'S PROCEEDINGS.

The Board met on the 16th October, at Eleven o'clock and resumed the hearing of testimony.

Mr. GOULD, President of the Corn Exchange, and representing the Grain Trade.

As my own business is mainly in the grain and flour trade, I am more conversant with those branches than any other. Grain is shipped from the Western States both in sailing and steam vessels,—principally in sailing vessels. The steamers will come through to Montreal. A sailing vessel will break bulk at Kingston. They tranship at Kingston by floating elevators into barges carrying an average of 20,000 bushels. These barges are towed from Kingston. On arrival at Montreal, they generally get orders in the canal as to their destination, whether to lock down into the harbour, or to go to storehouses. The grain stores are all on the Canal Basin, and when barges or steamers discharge there, they do not require to go into the harbor at all, unless it be to receive certain kinds of up freight, such as railroad and pig iron, salt, &c. When grain is to be discharged into ships, the river craft generally goes at once alongside, and if the ship is ready to receive, it is discharged in a few hours. Sailing vessels from Chicago all discharge at Kingston. Propellers generally carry about 16,000 bushels, and bring their cargoes to Kingston, through the Welland Canal, without breaking bulk. At Kingston, however, they are obliged to lighten about 4,000 bushels to enable them to pass through the St. Lawrence canals, and then they come through to Montreal with the remainder of the cargo. The great object of deepening the Welland and St. Lawrence Canals is to enable vessels of larger size than are now in use to come through to Montreal without breaking bulk. The tonnage of the propellers now running is from 400 to 500 tons. It is hoped that when the canal enlargement now contemplated is completed, vessels of 1,000 tons will be able to navigate the canals. The draft of a thousand ton vessel would be, I suppose, from 12 to 14 feet. The Welland Canal cannot now receive vessels of such capacity. General merchandise, or "up freight" as we term it, designed either for Canada West or the Western States, goes by railway and by water. The bulk of that which goes by water is now carried on propellers. These are preferred because transshipment is avoided, the propeller landing her cargo at whatever port it is destined for. "Up freight," when loaded into barges at Montreal, has to be discharged at Kingston, and again loaded into the lake craft, which involves not only more or less loss by breakage, &c., in handling, but is attended with

considerable delay and expense, all of which is saved by the employment of the propeller. The number of steam vessels employed in the trade is as yet limited, and they move only a small proportion of the grain that is brought forward to Montreal, but I think I have noticed for a few years past that the tendency of the trade is toward steamers, and I have no doubt that they will form an important feature in the transport service whenever the navigation will allow the employment of the large class steamers before alluded to. The grain trade is subject to many and rapid fluctuations; prices rise and fall, sometimes in a period of ten days, enough to make a man's fortune or ruin him entirely, as the case may be. It is very important that the risk of these fluctuations while in transit should be reduced to the shortest possible time. Grain shipped on a sailing vessel will occupy an average of twenty days in coming from Chicago to Montreal; by propeller about one half that time, or ten days. The saving of ten days interest, as against twenty days, is also a matter of very considerable importance. For these reasons, I am inclined to think that the large-sized propellers will come through to Montreal with their cargoes, but the large-sized sailing vessels will hereafter, as they have heretofore, discharge their cargoes at Kingston, or whatever other point may come to be regarded as the foot of lake navigation.

Q. Do you think the Western States are likely to do a large importing business by way of the St. Lawrence?

A. It is hard to say; but little is done now, although immediately after the great fire at Chicago, quite a trade sprang up for a short time, but probably owing to special circumstances, for a few years past the railway iron used by the western railways, then in course of construction, was largely imported by way of the St. Lawrence. That has now pretty much ceased, but I can see no reason why the western merchant should not avail himself of the superior advantages possessed by this route over any other.

The wholesale trade of Montreal covers pretty nearly the entire country, the imports at Montreal constituting a very large proportion of all the importations into the country. I do not mean to say that all goods imported come through Montreal merchants, but they come mainly to Montreal as a distributing centre. Montreal largely supplies Quebec and the Gulf Ports with breadstuffs.

There is no expense to the owner of grain from Chicago to Montreal, by reason of transshipment at Kingston. A charge is made there for elevating of one-quarter cent a bushel, which is paid by the vessel discharging, and which forms part of her running expenses. The charge is made whenever elevators are used. When the grain reaches Montreal, if intended for shipment to a foreign port, it goes alongside the ship, and is discharged into it at an expense of one-half cent per bushel, the barge or propeller paying one-half, and the ship receiving it, one-half. The owner pays nothing, except a charge of one-eighth of a cent for screening. These, with the wharfage, embrace all the charges incurred, and are so much added to the cost of the grain. If the grain is put into stores, and afterwards shipped, the charges are: for storage, one-quarter cent for the first five days, and one-half cent for each additional ten days that it remains in

store. This includes all charges of receiving, weighing into store and out again, and delivering it to lighters. Lighterage is not a fixed charge, but may be put down at one-half cent per bushel, including the shoveling, which expenses are all borne by the owner, as well as half the cost of elevating from the lighter.

Demurrage, as a rule, does not pay the vessel. A steamer will not consent to let her cargo remain on board, and accept demurrage; but will discharge into store after a reasonable delay. If she arrives, and the ship into which her cargo is going is not ready to receive it, she discharges into store. Her owners would never submit to have their vessels used as store ships. We are obliged to have storehouses for grain; and, as our trade increases, will probably require more than we now have (although our accommodation in that respect is now fully equal to the ordinary requirements); but I think that is a branch of business that will regulate itself. Private enterprise will supply stores as fast as the trade requires them. They will, in that case, have to be on the canal, and not on the wharves. Difficulties would be found in the way of building stores on the wharves, owing to flooding and shoving of ice, and provision would have to be made for that. Warehouses could be built upon the wharves, I suppose, but I do not think them necessary, nor do I think they would lessen charges in any way; on the contrary, they would be likely to increase them. Grain warehouses are not suitable for storing general merchandise; they require peculiar construction, and are expensive to build. Owing to our geographical position, we do our business only during six or seven months in the year; and if we build costly storehouses in which to do six months' work, the cost of maintenance and interest on the outlay will largely increase the cost of handling grain. There is a sharp rivalry in carrying grain, and every facility to the trade is necessary in order that Montreal may compete to advantage—but it is very important that we keep down the charges. I think we should keep that constantly before us, and look to reducing rather than increasing them. Great efforts have lately been made in New York, and apparently with success, to reduce the charges in that port, and at Buffalo, and on the Erie canal charges are being cut down wherever practicable, and we must be prepared to do the same. At New York grain arrives by rail as well as by canal, they have railway communication and an open seaboard all the winter, while we are hermetically sealed during that period. There has never been any disposition to accommodate grain here in the winter, the tendency is rather to keep it back until the opening of Navigation in the spring. In Western Canada, on the line of the railways, mostly every shipper has his own small storehouse where he can hold his grain all winter, free from cost, but if he sends it forward to Montreal, then expense begins upon it. Most of the grain which passes through Montreal in winter goes to Portland, we never see it here. The Grand Trunk brings but little in summer. Freight on wheat from Chicago amounts at present to about 10 cents a bushel in American cy. i. e., 6c. to Kingston and 4c. from thence to Montreal, or say 9c. in gold. No railway can compete with that. The G.

T. R. carry grain from local stations on their line when they have not access to the water. There are times, when ocean freight is higher than now, when Railway Company's make through rates from the West to Britain, they carry the grain to the seaboard and pro rata with the steamship, after carrying it the whole length of their line for much less than they charged local customers for part of the distance. The local traffic over the G. T. R. goes mainly into store on arrival. If intended for shipment it is then put into barges and transferred to the ocean ship. If storehouses were upon the docks it could be discharged into them at once without expense. If large propellers come in and ships are not ready to receive their cargoes, it will be necessary that storage room be provided either by public or private enterprise. During the present season there has been no great pressure of business in the carrying trade, and canal barges have mostly held the grain on board until ships were ready to receive it. This would be a great inconvenience when a large business was being done. It has been remarked that these barges are cheap storehouses, and it would be better to have more barges than more storehouses, which I very much question. It may be done at times, but forwarders cannot often afford to let their barges lie idle and use craft for the purpose of storing that might be employed in bringing forward grain. A barge will make a trip to Kingston and back in a week or ten days, she will carry say 20,000 bushels, the freight on which would be \$800. It is easily seen that she could not afford to remain idle half that time without being paid a sum which, reckoned as a storage charge, would be very heavy indeed. In fact, I regard it as utterly impracticable. You would have your harbour filled with small craft, so that large ones would be unable to get into it. When the Montreal Elevating Company first began, they had barges for storing; but it did not pay, and they soon abandoned it. Another objection would be, that insurance in the harbour would be heavy from the liability of such craft to accident from being run into by other vessels.

The manufacture of flour in Montreal has not been a profitable business for a few years past, owing to the demand in England for our wheat. The price of that article here is generally relatively higher than the price of flour. The want of a well populated and thriving back country operates largely against milling here. The export of flour to the Maritime Provinces has largely increased during the past few years, but that is largely supplied from Canada West, the rates of freight by rail being comparatively cheaper from there than from here. Two winters ago the Lower Provinces imported very largely from the States, mostly from the extreme west, on through bills of lading, at prices that we could not begin to compete with; they are also so contiguous to Boston and New York, that they import largely of flour from those places to make return cargoes at cheap rates of freight for their fish vessels. I do not see how the construction of the Caughnawaga Canal would benefit my particular branch of business, unless we could have reciprocal trade relations with the United States. The difficulty now is that the duties imposed on flour prevent our sending into their markets. If we

had reciprocity we would have an equal advantage in supplying the Eastern States.

General Newton—Can you give us an idea what frontage of the harbor should be reserved for general cargoes—for the general business of the city?

Mr. Gould—No, sir; I don't think I could; I don't think I have sufficient detailed knowledge of it to know what is necessary.

Mr. Bell—There is another point, viz., water-power, to which I wish to call your attention. There has been a proposal to bring in water from above the Lachine Rapids, so as to utilize it for power. Do you think that would be taken advantage of to any great extent?

Mr. Gould—Well, of course, any opinion on that subject would be purely conjectural. It is hard to say what would be the effect, but there is this fact to be borne in mind, that there are immense water privileges throughout the country. Lower Canada abounds in water power, not privileges, however, connected with navigation, as there would be in Montreal. How far that will be taken advantage of I cannot say, but I presume it would be to a considerable extent. The experience of the past has shown that wherever the Government has had water power to lease, in connection with the canal system, it has all been taken up, but I am not aware that any very considerable demand has existed beyond that limit. Of course these things create their own demand; as you open up facilities for trade, trade comes where it did not exist before. So in this case the fact of there being mill power to be disposed of might make it an object to get it.

Mr. Bell—What we have to consider is that if such a matter is entertained, whether provision will require to be provided to leave space for such water being brought down—because it would require a large channel to bring down the water, and land would require to be provided or set apart for that purpose?

Mr. Gould—Yes sir, unquestionably. You speak, I suppose, with reference to this dock system. That plan proposes to supply the water power through this channel. The question in connection with that has often suggested itself to my mind whether in order to get your water power you have not to incur an immense expense, a larger expense than what you would get a return for—that is to say independent of any dock or wharfage system—often suggested itself to me whether it would be prudent to spend that money to create a water power. I question that very much; I have no doubt in my own mind that it will not be prudent to do so.

General Newton—The value of the land would be great?

Mr. Gould—Yes, sir; but if you combine the water power with other things—for instance—docks and other facilities, such as warehouses and all that sort of thing, in connection with it—then, of course, it becomes another question.

Mr. Bell—Another question is whether there should be locked docks, or if it would not be better to have basins. In a dock you must lock your ship; every ship that goes out or comes in you must lock; with basins you can go in freely?

Mr. Gould—Your dock would also require to be constructed; it would require to be finished in itself, that is to say?

Mr. Bell—Not necessarily; the docks could be so far constructed for present use, and leave space for extension.

General Newton—What Mr. Gould means is, that there must be a deal of work done before you can finish it at all.

Mr. Bell—Your locks must be finished, but not necessarily your quay walls?

Mr. Gould—The idea has always been in my mind that our trade, the trade of this port and the business of the city of Montreal, is going to be one of gradual growth; not going to turn to the utmost of our capacity and business in the course of a year, or a few years, but will grow gradually. I look upon the development or settlement of our western country as affording the basis for the prosperity of Montreal as a port; that is where our foundation is to be, it strikes me; and then, as we get what General Newton calls the overflow of the western trade, that will augment our trade to a very considerable extent; but the development of our country is going to be, after all, the basis of our prosperity,—that must be so of necessity. It is a question of time; it is not going to be a matter of a few years; and I have always thought that, in any extension of our harbour improvements, it should be the endeavour, if possible, to devise some system that would expand and develop in proportion with what is required by the necessities of the case. By such a plan you would not burden the business of to-day by providing facilities for that which is to come in ten or twenty years hence. I don't know whether that is a practical scheme or not, but it has been my idea for some time—a system, the plan of which should be complete in itself, but susceptible of gradual development as necessity arises.

Mr. Bell—Well, with that object in view, would you not consider it advisable that the position for future works should be looked out, and the ground set aside exclusively for that purpose, even looking a good way before you?

Mr. Gould—Yes.

Mr. Bell—That whatever work is done, other ground should be acquired and set aside for works that will hereafter be required?

Mr. Gould—Yes; that a definite, well-digested plan should be adopted, and wherever ground was required to fully carry out that plan, it should be obtained for that purpose. I do think that would be well.

Mr. Bell—Even though the work was not constructed for years?

Mr. Gould—Yes, sir; because in a country like this no one can form an estimate of what a piece of ground you are looking at to-day will be worth 20 years from to-day.

General Newton—You speak about the great many obstacles you have to your trade; what trade do you supply by your mills?

Mr. Gould—We have had in former years a large trade to Great Britain, but, as you very correctly remarked, that trade has been contracted every year from our inability to compete with the English miller. The mill power of Great Britain has

increased wonderfully since I have known anything about the milling business. I know the mill power in Glasgow alone has quadrupled. We used to ship immense quantities of flour to Liverpool, Glasgow and London, but in the last few years it is only occasionally we can do it; the rest of the trade is devoted to supplying Quebec and the Gulf ports, and such other portions of the Provinces that we can manage to supply.

General Newton—But they are now being supplied through New York and Boston?

Mr. Gould—Yes, sir; largely by through rates during the winter season. Ordinarily during the open season our main competitors are New York and Boston, growing out of these return cargoes, but during the winter season the traffic is done by rail; then, as you can easily see, the man who is farthest off from them gets relatively the cheapest freight; so the farther west they go the cheaper they get their flour.

General Newton—So they can afford to underrate you?

Mr. Gould—Yes; that is the position of Montreal, which is an abnormal one, that will cease the moment our railway system becomes developed. That is why our people are seeking to have other railways run into the city.

General Newton—You see no prospect of material increase in the flour trade?

Mr. Gould—No, sir.

General Newton—You cannot tell how it will occur?

Mr. Gould—Montreal has a large flour trade now, but that flour is largely made in the Western Provinces. A large proportion of our mills this summer, and those of our neighbours, have stood idle, done nothing, while large quantities of flour have been brought from the West; but that is, perhaps, the position of things that I don't know can be guarded against. It is merely the law of supply and demand. The western man sends his flour to this market. It is sold here at a profit or a loss to him, whilst the miller of the city will only manufacture when he sees it will be profitable to do so. These are peculiarities of the trade that apply to any country.

General Newton—I should judge from all I see of the manufacturing of flour in Montreal, except for the neighborhood, it is not wearing a very promising aspect?

Mr. Gould—It is not.

General Newton—And that there does not appear to be any demand for the increase of facilities for its manufacture?

Mr. Gould—I don't see any particular necessity to do so. I should be delighted to be able to present it in a better shape.

General Newton—You speak about the construction of the Caughnawaga Canal—would that increase the milling to any extent?

Mr. Gould—I don't see how it would, although I can easily see, if we had access to the New England market, by rail or water, it would be a great increase. You can see, yourselves, the addition, by acquiring eight million more customers, would be a great advantage to Montreal; and I look forward to the time when the barrier will be removed, and Montreal will become the place of deposit for the breadstuffs of New England. If you strike a circle, and take Montreal as centre, you will find that you take in almost

the whole of the New England States, making this the nearest and most convenient point from which they can receive supplies. I speak of broadstuffs. I know it always was the firm conviction of my father, who was many years in the business, and gave a deal of study to the subject, that that would be the inevitable result if we had free communication with the Eastern States; then the Eastern States would look to Montreal for supplies. If that were the case, the characteristics of the trade would change, and we should want storage accommodation; there would be immense quantities of grain and produce from here to be transported by rail during the winter to all parts of the country. It has always appeared to me that that was no visionary scheme.

General Newton.—The reason I speak of the Caughnawaga Canal is, because it is generally supposed to be the connecting link with the Eastern States; but you have the disadvantage of having to tranship at Burlington and take the rails, and it would be a question whether direct railway connection would not be as cheap as this transhipping?

Mr. Gould—My own impression is, supposing the Caughnawaga Canal built, it is simply transferring to Burlington the position that Montreal now occupies by right of situation; to a great extent that would be the effect, so far as Montreal proper is concerned. The building of the canal will be a great benefit to the country at large; but there are some branches of trade, peculiar to Montreal, that I cannot see will be largely benefitted.

General Newton—The charges by the river for towage, and insurance between Montreal and the ocean, are they not generally considered a great tax on the commerce of the port?

A. Insurance by the St. Lawrence is generally higher than by other routes. I have no special knowledge of towage charges, but I know, for a fact, that it is a general cause of complaint on the part of vessel owners.

General Newton—And do you suppose that a reduction of these charges would lead to an increase of the trade of Montreal?

A. It would undoubtedly have an effect in that direction; but this and kindred subjects are matters that I consider will, in the end, be regulated by private enterprise. When the demand exists, provision will be made for it. Private companies will be found just as fast as there are indications of permanent business. I am referring now to the towage question.

FOURTH DAY'S PROCEEDINGS.

The Board re-assembled on 18th October, at Ten o'clock, when the following testimony was given by

HON. JOHN YOUNG, Chairman, Harbour Commissioners.

General Newton—You know all about the occasion that has brought us here, and the information that it is proper to impart, and we will be obliged if you will give it in your own way?

Hon. John Young—I have been long engaged in business in Canada. Up to this time I have been twenty-two years connected with the Harbour Trust of Montreal, and for twelve years of that period have acted as Chairman. In early life it was part of my business with the firm, in which I was, to travel in the Western States purchasing property of all kinds, flour, grain and provisions. Some of these I sent occasionally to New Orleans, others by way of New York, and other portions by way of the St. Lawrence. In this way I became familiar with all the routes to the ocean.

I will now allude to the progress that has taken place in the trade of Montreal. It will be found that this progress has kept pace with the improvements in the channel of the river between Québec and Montreal, and in the harbour, as this table will shew :

Year.	Number of vessels from sea.	Tonnage.	Average size.	Depth of water in Channel.
1845.....	207	49,635	247	11 feet.
1850.....	205	45,000	251	11 "
1854.....	258	.....	280	12 "
1857.....	378	161,901	430	16 "
1860.....	479	198,000	440	18 "
1866.....	...	.....	...	20 "
1874.....	731	423,425	580	20 "

These figures show that up to 1852, when no improvement had been made, trade was stationary; but in 1854, when the channel was deepened one foot, the trade began to

improve, and it has gone on improving till 1866, when the channel was completed to 20 feet. Since then, no improvement has been made, but there is the remarkable contrast of the average tonnage of the ships coming to Montreal in 1850, being 247 and 251 tons, while in 1874 the average had increased, by the deepening of the channel, to 580 tons, and the number from 207 to 731 vessels.

Another remarkable fact is the substitution of steamships for sailing vessels; this tendency is still going on. The economy in the rapidity of movement, the improvement of the steam engine, and the lessening of insurance, are all operating to produce this change. The figures which I now give you will show this:

Year.	Number.	Tonnage.
1864.....	51	59,071
1869.....	117	117,965
1872.....	215	217,715
1874.....	266	262,096

It will thus be seen that the trade by steamships has increased about five times since 1864. I merely mention these facts to show you the vast increase which has taken place in the trade of Montreal. I shall further prove this by giving you a memorandum of the exports and imports:

1833 to 1837 was	.....	\$ 4,697,336
1843 to 1847 "	.....	11,167,774
1853 to 1857 "	.....	17,812,407
1863 to 1867 "	.....	31,032,266
1873	"	71,787,658

showing a continual, but gradual increase in the trade of the port from \$4,697,336 in 1833 to \$71,787,658, in 1873.

The number of vessels which carry on the local trade of the Province, and the local trade of the St. Lawrence, has been also increasing, as the figures which I now place in your hands show:

Year.	Number.	Tonnage	Average size.
1861.....	5,247	530,224	104
1871.....	6,878	824,787	120
1874.....	6,958	956,837	140

Thus illustrating a gradual but continual increase. The greatest number of vessels in port at one time

In 1861 was 197
 In 1871 " 281, on the 6th October.
 In 1874 there were 201 vessels in the port on the 6th June.

The result of this was that, with our limited accommodation, the port was exceedingly crowded; shippers were put to great inconvenience and expense by detention, and I have known large ships obliged to wait for 7 to 8 days for a berth. Everything was done at a disadvantage; and there was, and is, no economy in handling either inward or outward cargo. I heard one of the gentlemen state, in evidence before you, that the flour trade was not increasing at this point. This is a mistake, as these figures will show:

Receipts at Montreal	Average five years.
1846 to 1850....	545,171
1856 to 1860....	597,054
1866 to 1870....	853,953
1871 to 1874....	962,453

showing a gradual and continuing increase. This, too, is independent of the amount manufactured in Montreal. The average amount manufactured depends largely upon the crop. If that is short, the export of flour is not so great. For instance, I have imported flour, bought in France, and sent it as far as Kingston, on the St. Lawrence; I imported wheat in the same way, and some has gone as far as Buffalo, in the United States. These were exceptional years, when the crop failed in the United States and Canada. I give these figures, gentlemen, to show what a vast amount of accommodation is required in this harbour, if we intend carrying on the business of the future, and when I say that, I may state also, that our receipts are only about 15 per cent. of what passes down through the Erie Canal and over the American Railways, so that you can estimate the prize we are contending for. The St. Lawrence has great natural advantages, but our trade is small, compared with the magnitude of our works; in fact, the works on the St. Lawrence have never been completed. I look upon the connection between Lake Champlain and the St. Lawrence, by canal, as necessary to secure us part of the Great Eastern trade of the United States, for in New England they do not grow enough to give them one month's consumption. I had occasion to compile a table some time ago, which showed that about five-eighths of all that came from the West was consumed in Eastern States, and only three-eighths exported. When this canal into Lake Champlain is completed, instead of the great amount of property centering now in Buffalo, 400 miles above Montreal, it will be brought within six miles of us. Next, it becomes highly important for the Western merchant to have a choice of markets, and it will be an advantage to him to have a depot for his produce where

it is equally convenient to send it to the United States or to ship it down the St. Lawrence. Such advantages will be secured by the proposed docks below Victoria Bridge, which will give ample accommodation for warehousing, and where vessels can go and unload without loss of time. Insurance would be less, and produce could be sent on to Lake Champlain at any period, by rail, in winter or summer. The distance now to Portland is 292 miles; that distance can be shortened from 40 to 60 miles, making the distance about 240; whereas Oswego is 340 miles, and Buffalo 500 miles from New York, so that, in every point of view, Montreal is the more favourable and more central point. The merchant cannot always decide upon selling his grain on its arrival; at present he is forced to sell or ship, unless facilities should be afforded to put the whole into store. If those facilities were created, the merchant of the West might then hold his grain here at a better point than at New York, at a low rate of insurance, and where it could be shipped either to Europe or to New York, or by rail in either winter or summer. In reference to this subject, I would point out on the map the old Custom House, as a central point. From the Custom House down to Victoria Pier it is about 3,000 feet; if you go to Monarque Wharf it is 6,300; and to Commissioners Wharf 5,300 feet.

General Newton—Is that from the centre of the wharf?

Hon. John Young—Yes, sir; I take it from the centre. If you take the east side of it, from the Custom House up to this place, it is 1,900 feet only; from the Custom House to the centre of the docks it is 4,600 feet; to the entrance of the dock here [place indicated] it is 2,400 feet, and to the middle of Mill Street 3,700 feet.

Mr. Bell—Would that take a direction through the streets, or in a regular line?

Hon. John Young—I am taking it in a regular line. A portion of all these wharves is partly piled and part of crib work. I am speaking upon the belief that we shall have a channel of 25 feet.

Hon. John Young alluded to the fact of the new Allan steamer "Sardinian," which recently arrived in port, drawing 19 feet 8 inches, when there was 20 feet 6 inches in the channel, and had touched in the harbour.

The whole width from any of these wharves, from the outside of the channel in the harbour, is only 300 feet, and from the Market Basin, or Island Wharf, the breadth of the channel is only 300 feet. No improvement, in my opinion, can take place in that channel in the harbour, because the deepening of it to 25 feet would undermine the structure of the wharves. The channel is entirely too narrow now at all of these points, and sometimes confusion takes place. Then again, the Lachine Canal,—at its lower entrance into the harbour, the width is only 275 feet, and I have known it choked up so that vessels trying to get through were detained two or three hours; that state of things exists now. This part of the canal never can be enlarged unless the whole plan of the city is changed.

You have streets and warehouses on one side, and the mills are on the other. To widen it would require to take the whole of these mills away. If that state of things now exists, I ask, what will it be when vessels of 1,000 tons come through the Welland and St. Lawrence Canals. The entrance of the Lachine Canal, as well as the basins above, are being made for vessels drawing 19 feet on the mitre sill of the locks, which is wholly unfit for the ocean ships. I heard Mr. Henshaw say that the coal vessels generally draw 18 feet, but on looking at the books I find coal vessels drawing 22 feet (from the Lower Provinces) had arrived this year when there was 23 feet in the channel, and for these this Lachine Canal entrance and basins are useless. I hold it as a principle that, with steam vessels adapted for the trade between Picton and Sydney, etc., the cheapness in freight is dependent upon the quantity of coal they can move in one bottom—if they can bring it to the right point without hindrance or breaking bulk, and to places where the coal can be discharged with facility into the Railway, or for Upper Canada, or the city. At present, great expense is incurred by moving coal from the wharf. I was an unsuccessful opponent of the Railway being placed on our narrow wharves, and it has limited the capacity on them for coal business to an enormous extent. The whole of that property at Windm. Point was reclaimed for the purpose of getting a wharf for the Grand Trunk, level with McGill Street, and although highly approved of by Messrs. Shanly and Keefer, it was not adopted. The intention was to make a station house for passengers in McGill Street, and the freight station south of the canal. The Government plan will be found costly, and not adapted for ocean vessels. There ought to be some means for large vessels to go into a dock with 26 feet of water.

General Newton called Mr. Young's attention to places on the map which other gentlemen had spoken of as a proper place for landing the special cargoes for Grand Trunk Railway, and also for a coal yard; and further, to the effect that it was necessary for the Grand Trunk rails to go down on the wharf to be close to the vessels.

Hon. John Young—That is for general cargo, when our channel is put down to 25 feet, which I calculate will be accomplished in four or five years. We have no place in our harbour at present for vessels of such draft. I hold that here is the best coal station, in the proposed dock, and I would have all these rails go at the back of these stores in the dock, and that space adapted for coal sheds, so that it could be moved expeditiously by rail as well as by canal. I believe that coal is going to be a large and important trade; it must inevitably be so, and by going up there vessels could get coal or could get flour. The general merchandise ships could go along side here and into this dock. I suggested, some years ago, whether there could not be a tunnel run from the proposed dock under the canal, the same as at Chicago and other places. If such were at all possible, it would be a great advantage; there is not room here at present; the trade is going to be enormous, and though several

parties do not take my view, I think time will bear me out in my opinion. For instance, there are parties who say you should not deepen the river between Montreal and Kingston, and that the true way was to bring produce by barges. I look forward to the time when vessels from Lake Michigan or Superior can come down here without breaking bulk, with comparatively very small and not costly improvements, to the rapids. They can come down, and be here at the Port of Montreal, almost as soon as they had time to get their turn at the Elevator at Kingston. They could come and deliver, right at the store, grain, as they do at Buffalo, and then take in their return freight, and start again on their Western voyage. I am not sure but that each of these propellers might not take in tow two or three barges with their cargoes in the summer season, both up and down. Of the economy of bringing down large vessels, I have no doubt at all: there is no room for such propellers at present in the contracted limits of this port. By building this dock, and having this water power for either discharging wheat, or for milling or manufacturing, you provide a harbour such as exists nowhere on this continent. You would have vessels from sea 120 miles nearer the Upper Lakes than any other port on the Atlantic. The cheapness of moving cargoes depends somewhat upon lighterage. Montreal has the advantage of bringing the cargo, water-borne, without lighterage, to a point where it can be shipped or railed to the interior. A very large portion of cartage would be avoided by taking sea-going vessels into this dock. The greater portion of the cargoes are for Western Canada; of course, not so much for the Western States now, but once open up the communication and the increase of the volume of trade for these Western States will flow in.

Mr. Bell asked, in reference to crossing the canal, which was the principal street to gain access to?

Hon. John Young—Wellington street is the principal street.

Mr. Bell—There should be nothing in the way of getting two bridges put over the canal here, so that when one is closed the other is open?

Hon. John Young—I think you will find it possible to go under these with a tunnel. Of course the water would rise in winter into these tunnels if it is not prevented, but in summer time it would be perfectly clear, and it is in summer time it is wanted.

Mr. Bell—Besides that, it would be very easy to have two bridges the same as in Liverpool?

Hon. John Young—Yes, sir; no difficulty about that. I was going to mention to you as matter of information, that the Erie Canal yielded to the United States, up to this period, the handsome sum of \$65,000,000; the Erie Canal cost \$50,000,000, so that the State of New York has \$15,000,000 in hand from that canal, while our canals have not paid a tenth of one per cent, since they were built. Unless we create facilities for trade in the harbour of Montreal by every possible means, the trade will not stop here. This dock or plan of extension will be an assistance to the canals, as it

should be connected with them, and will not, I think, increase the harbour dues; I would never think of going on, or attempt to go on with it, without Government assuming the work of deepening the lake and river to 25 feet. That, I have no doubt, will be accomplished, and then, I think, we would have ample funds from harbour revenues for the purpose of going on with such dock improvements as may be suggested; but the two works cannot go on together, if both are paid from harbour revenues. From the facts that I have given you, with reference to the movement and gradual and steady increase of trade, I have no doubt that the increase will go on in the same ratio, and still greater when the canals are increased so that vessels can come here with double the present cargoes, and when the channel shall have been deepened, so that vessels can come up from sea without any kind of lightering. When we look at the fact of our own country, as well as the United Western States, only partially developed, I have no doubt that you can safely count on the increase of trade in the future being as large as in the past. There is another trade that is going to spring up in Montreal,—there is a Railway about to be built from Montreal to Quebec; that Railway will cross many important rivers, from whence a large amount of lumber will be carried by rail.

Hon. John Young described the rising land opposite Isle Ronde and St. Helen's Island, and alluded to a bridge which is contemplated across the river at that point.

General Newton—Will that bridge be a railway bridge?

Hon. John Young—For passengers on foot and in cars, as well as a railway bridge. Another railway will go from Montreal up the Valley of the Ottawa, and will open up an extensive country. This railway is about being built also; it will go past Ottawa, through to Sault St. Marie, and connect with the States of Wisconsin and Minnesota. From this region Montreal will be 500 miles nearer than any other port on the Atlantic seaboard. For the accommodation of this trade, breast wharves will be required in Hochelaga Bay. This trade will be very great, and I look upon that trade as, in my opinion, totally different to any you can get by the Lachine Canal. The one is the trade of the St. Lawrence, the other the trade of the Ottawa Valley. This will be the great centre of all this trade. The whole of this space affords ample accommodation for lumber and minerals from Lake Superior, and for which Montreal is going to be the point of exportation. This part of the city is destined for those trades, and the one will never interfere with the other.

General Newton—What accommodation would you give the Grand Trunk Railway, while the general cargoes lie at this place? You do not like to have tracks in their present position; what accommodation would you give them for loading under present circumstances?

Hon. Mr. Young—Well, there is a wharf that we are building now at Windmill Point. I can see no better place than to put them there at present.

General Newton—Yes, coal will do well there and special cargoes—but for general cargoes?

Hon. John Young—I see no settlement of this problem except that of docks. Around all of these docks there should be double or treble tracks of Railway, close to the stores and shipping, thus every convenience could be afforded, and cartage lessened or made unnecessary. The most expensive part of the dock, the abutments of the Victoria Bridge, is already built; but, if the dock scheme was carried out, the Grand Trunk would have ample space round it, and besides you take them off the wharves entirely. You cannot raise the wharves over their present height. Sometimes in the spring of the year they are flooded. If you put a wharf up high, the ice would catch it and create damage. The water rises to about twelve or fourteen feet above the wharves, and the ice not being deeper, flows over them; occasionally a plank is torn up, but the wharves, as you see them now, have stood for twenty years. If you lift them up I have no doubt they will be carried away. It is from their lowness that they escape. There is a channel in the harbour of deep water, outside of the present channel, where there is 25 feet, and would require but very little dredging. It is in contemplation, if this dock was built, to run it into this deep water. Then you would have two channels,—one being perfectly straight; long vessels have great difficulty turning in the present channel; pilots have to use great caution, but if the shoal was wharfed and channel cut outside, you have plenty of room to run round it.

Mr. Bell—You would require to have the outside walls of Point St. Charles dock strong enough to resist the ice?

Hon. John Young—Yes.

In answer to a question as to rafting timber,

Hon. John Young—We have had complaints of rafts being tied to people's property at Lachine. This is against the law, and these parties want to bring their timber through to Montreal. Some parties boom timber in the Government booms at Lachine, but these are insufficient. They come to us and say, "we want space to store our timber, we are willing to pay you any price." A very good place for that trade is above the bridge, and connecting Nuns' Island with it. I don't know whether you have seen it or not, but by putting booms of floating timber across there, you can have the whole of that place in connection with the shore for lumber. I have thought, as the Government are about enlarging the Lachine canal, if this place, or any place which you gentlemen may suggest were presented to the Government—and as the public interest is our interest and the interest which we represent—that they might see the economy, instead of enlarging the Lachine Canal, to make a new and independent canal, and bring it in connection with these docks. The estimate for these docks was two million dollars, but if the works cost six millions it will be nothing compared with their utility to trade. It would be a work for the future, and be the means of cheapening charges to the Western exporter and importer, and make Montreal one of the best harbours on this continent.

General Newton—Going back to that dam from Nuns' Island, would it not require a dam here?

Hon. John Young—If taken in connection with a new canal, it would have to be dammed. There is no shove of the ice between Nuns' Island and the shore. There is no movement of ice as there is on the outside. The land in the locality has increased in value, but its cost is still small in comparison to places further down. Messrs. McAlpine, Kirkwood and Childe said the water-power of the docks would three times over-pay the interest on the cost; and I believe it would pay all the dues of the harbour.

General Newton—These logs or rafts you speak of, are they wanted for the Montreal market?

Hon. John Young—Yes, sir; those for Quebec go down the rapids, on the other side of the island.

General Newton—Do you know what the value of the log trade is for Montreal?

Hon. John Young—No; but we can get you the value of it from one of the Commissioners (Mr. Donovan), who is in that trade, and can give you all the information you desire.

Mr. Bell—What you propose is to put a dam across at Nuns' Island, and float the rafts by the river, if improved?

Hon. John Young—Yes, sir. The mode of doing so will have to be decided by men of experience; but, as a merchant, and as one who has watched the needs and requirements of the trade here, I know what the necessity is. There are some who think that Quebec is a more natural point for trade than Montreal. I have never been of that opinion, provided proper facilities are created here. I think there is a law governing such things, and that where you can bring the largest ship possible up the greatest distance, without breaking bulk, the more it will be found economical to bring her up; and further, a vessel coming from the lakes here, of 1,000 tons, would not go to Quebec, if proper facilities are provided here, because the more trips she can make in our short season the more profits she will have. The shorter time spent in the port in discharging and loading with a return cargo, will also increase her profits, or lessen the charges to the public; hence, Montreal is, in my opinion, the great natural point, provided, always, that ample and complete facilities are created. There is no place I know of where facilities can be provided to such an extent. Then there would be ample room for all trades, and for moving ships about in the dock. If the sea-ship was locked up, the other vessels would not require to come down. In 1854, we received 19,746 tons of coal—that is, from sea and from the Maritime Provinces. In 1864, ten years afterwards, we received 49,536 tons; and ten years after that, say in 1874, we received 148,000 tons. That is independent of coal from the United States. It was more than double in the ten years—in the first ten years between 1854 and 1864, and it was treble from 1864 to 1874.

Mr. Bell—It will grow much faster now?

Hon. John Young—I have not the slightest doubt of that; I have no reason

whatever that would lead me to think there was going to be any diminution of the coal trade in this country, and especially here.

Mr. Bell—What has the increase been, mostly private houses or manufactories?

Hon. John Young—The Grand Trunk Railway takes a very large amount; these railways must increase, and coal must more and more be their fuel.

Mr. Bell—Formerly they used wood?

Hon. John Young—Yes, sir; and it is difficult to get wood now; there is a great deal of coal used in manufactories and in steamboats.

Mr. Bell—And houses?

Hon. John Young—Not so much in houses; they use American coal; that is a very large trade; I have not got the figures now, but will have them in a day or two, as to the amount of tons.

In answer to a question by General Newton,

Hon. John Young—The moment connection is made by canal with Lake Champlain, there will be, within six miles of us, vessels ready to take freights back to the West, and that will be a great advantage to Montreal. You will have then, within hail, vessels ready to carry your freight to the Western States. An example of this is seen now in the vessels carrying coal from Pictou, Sydney, and the Maritime Provinces up to Montreal; they load at Pictou, come up here, and are so fitted that if they cannot get freight, they can go back with water ballast. Flour has been carried by them to Shediac for 15 cents a barrel, and from thence to St. John for another 15 cents, or from Pictou to Halifax at the same rate; but they could not do this if it was not for the up cargo of coal. It is the two cargoes that enable the ship to carry at so cheap a rate; and just in proportion as we attract trade to the St. Lawrence outwards, we shall be able to take trade backwards at cheap rates. As you are probably aware, the Senate of the United States appointed a Committee last year to investigate this subject of transportation, and their report is most favourable to the St. Lawrence route to New England and the Eastern States. They do not hesitate to say, that in one year \$7,000,000 would have been saved by the Caughnawaga canal.

General Newton—You cannot ship grain back to the United States which you import from the United States?

Hon. John Young—Not without paying duty upon it, or putting it in bond.

General Newton—I was told, I won't say by whom, that the Caughnawaga Canal would be of no use until the United States had altered the tariff?

Hon. John Young—They are mistaken. We have a right to send goods through in bond; and, independent of Canadian goods, it would prove the best route for the produce of the West, and there is no hindrance to Americans passing through our canals.

Mr. Bell—And I presume that the reason you don't send railroad iron is on account of the depression in business.

Hon. John Young—There is no other reason than that.

General Newton—Unless your imports in Montreal bear a certain ratio to exports, the latter would fail to increase?

Hon. John Young—There must be some relation to one another. The greater the imports, of course the profit of the ship will enable them to take freight back for less. Sometimes ships come in ballast to Quebec, to load lumber, but the freight homewards has to pay for the two voyages. The more imports we have, the lower will be the freight. Now the question is,—does Montreal have such an amount of import trade that it can immediately see its way clear to a still larger increase in the export trade? You, of course, can judge of these figures by the continually increasing population, and by the gradual increase in the past.

General Newton—Don't they sometimes buy a cargo of grain in Chicago, and telegraph for a vessel to receive it?

Hon. John Young—They sometimes do this; but the grain trade is done on the purchase system in England. It used to be consigned a good deal more than what it is now. That system is rather out of date; cargoes are, to a large extent, purchased by cable.

General Newton—Do you think that is due to the cable?

Hon. John Young—Yes, sir.

General Newton—And that this has caused a change in trade?

Hon. John Young—Yes; it changed the trade in that respect. Then, again, trade has been increased by the Confederation of the Maritime Provinces. Up to 1864, each of these Provinces had its separate tariff. Canada paid duties to Nova Scotia and New Brunswick, and Nova Scotia and New Brunswick to Canada. Under Confederation, you are aware, there is now on all the same duties, and there is now free-trade between each, as in the various States of the Union. That has increased trade with these Provinces, and it is increasing. Again, the facilities that are being created are adding very largely to this trade. We have, west of Lake Superior, a fine country, up to the Rocky Mountains, yet unsettled, and the country to the north-west States of the Union is only partially settled. The population is increasing, and as it goes on there will be growth of trade; and, just as these figures I now give you illustrate in the past this increase, so will the trade of the future bear out the opinion of a still larger increase, if nature is aided by art in creating facilities.

Hon. John Young handed the Board the following statistics:—

Imports and Exports received at Montreal.

AVERAGE RECEIPTS BETWEEN	IMPORTS.	EXPORTS.	TOTAL.
1833 and 1837.....	\$ 3,543,066	\$ 1,154,270	\$ 4,697,336
1843 and 1847.....	8,515,324	2,652,450	11,167,774
1353 and 1857.....	15,120,321	2,692,086	17,812,407
1863 and 1867.....	24,301,702	6,730,564	31,032,266
1873.	20,714,179	31,072,879	71,787,158

Hon. John Young continued :—The navigation, on an average of fifteen years, in the Lachine Canal, was 219 days; on the Welland, 234 days; and on the Erie, 215. The reason that it is so long on the Welland, is caused by the prevalence of north-west winds in the spring of the year, driving the ice into Buffalo Harbour; the northern ports are the earliest opened and the latest closed.

In answer to a question by General Newton,

Hon. John Young said that the average rate of freight from Chicago to Montreal, in 1873, was 18½ cents per 60 lbs. ; the rate of freight in 1874, was 16 cents ; and the rate of freight from Liverpool, in these two years, on the average of months, was 6s. 9d. per quarter of 480 pounds.

As I before stated, it was suggested the shoal opposite the city should be covered over for the accommodation of through freight, and connected with Windmill Point by a self-acting ferry; dry-docks are also wanted. It is found convenient to put the plates imported for vessels together here; and if dry docks were built below the bridge, a great deal of building such vessels, in such dry docks, would be carried on. We have no convenience now for doing it. It would serve as a winter harbour, where vessels could lay up and be repaired, instead of going to Sorel. Machinery driven by water-power could be had, which would not only be advantageous for Montreal, but for the whole country.

Mr. Bell—Why not remove this shoal altogether?

Hon. John Young—Well, that would do if you had any place convenient to put the stuff. There is a fine channel outside here, of nearly 800 feet wide that goes up to 700 feet, opposite the Island Wharf.

Mr. Bell—So if you had this removed you would have a free space?

Hon. Mr. Young—Yes, sir.

Mr. Bell—I don't think it will be a difficult matter?

Hon. John Young—Even to widen the channel 400 feet, and have a wharf at the edge there, would be useful, and the very material taken out here would fill up the wharf,

General Newton—How would you connect ?

Hon. John Young—By a ferry here to this wharf at Windmill Point.

Mr. Bell—Why not fill in all this ?

Hon. John Young—I don't think a wall can be carried out in that way that would not be carried away with ice. You cannot raise the wharves above their present position. The proposal for a winter harbour is a great necessity in our position just now.

General Newton—In order to have a winter harbour, you would require immense space ?

Hon. John Young—This space below the bridge here is 130 acres. This ground belongs to the Harbour Commissioners, and would enable docks to be made, and they would be the means of giving additional accommodation to the Lachine Canal.

General Newton—These basins of the Government, in the canal, would be a great place for vessels to winter in ?

Hon. John Young—Yes sir ; but only for vessels drawing 19 feet ; the basins are useless for vessels of a larger draught.

Mr. Bell—Will you tell me the part the Government owns ?

Hon. John Young pointed out the government lots, and said it was all important to secure land.

Mr. Bell—The acquisition of land is necessary for improvement ; a matter to which I think your city should give their immediate attention.

Hon. John Young—There is not a day to be lost in deciding where improvements are to be, and for securing necessary land.

Mr. Bell—Is it not the case that all this part of the town is flooded at certain seasons ?

Hon. John Young pointed out the parts subject to flood, and expressed the opinion that these floods could be prevented—and in doing this, a new system of drainage for the city should be adopted and arranged, not for the present, but for a population of at least 500,000. I would reiterate my opinion against what I consider a fallacy, that any stop whatever should be placed on the propeller coming down from the upper lakes by the discharging her at Kingston into barges. The rapids of the St. Lawrence can be so improved as to make them safe for the descending vessel at small cost, without using the canals. To stop her at Kingston, is to weaken the power of the St. Lawrence route. Delays at Kingston, by a large number of vessels coming in there with a westerly wind, where there are no adequate stores or elevators to give despatch, is destroying one of the best elements of the St. Lawrence route and of business in Montreal. Such a policy may be advantageous to those owning barges ; but I think it is not for the public interest of Canada, although it is the best policy for our vessels in Oswego.

FIFTH DAY'S PROCEEDINGS.

The Board again met on 19th October, at Ten o'clock, and resumed the hearing of evidence by

Mr. PETER DONOVAN, Harbour Commissioner, representing the Lumber Trade.

Mr. Bell—We have got from various gentlemen suggestions and information about the harbour, and will be glad to hear your views.

Mr. Donovan—Well, the lumber and the timber trade has been entirely ignored up to the present, so far as regards accommodation for landing (this applies specially to timber for city consumption), handling, &c., except for the South American trade, which has been accommodated by the breast wharves at Hochelaga. The local trade is very large; there is no accommodation at all for it; there used to be; but since those wharves have been extended, it has ceased. There used to be accommodation for drawing out timber above Wellington Bridge, but the Government made two new basins there two years ago, and did away with a slide that was used for the purpose. There is a kind of accommodation, which really is no accommodation; it is only an excuse for it. We have no place for hauling out timber required for city purposes within the limits of the harbour, except at Hochelaga; there was a place at Black Horse, but it is all built upon. We have no other place without going up to Cote St. Paul, except on private property. Ald. McGauvran hauls out timber on Government property. He has a slide running into the canal; then Henderson has a similar one; but they are only temporary fixtures made by themselves. We want accommodation for our large business. Mr. Young's idea I entirely fall in with. The lumbermen applied to Government last year to give us safe storage room for a large quantity of timber, and we proposed—at least it was suggested—that a very good place would be above Lachine, about three miles, at Isle Dorval, between the island and the main shore, but Mr. Mackenzie did not give us any encouragement of any expenditure in that direction. He suggested a joint stock company. It was represented that it would make a handsome return for the outlay, just to make piers on the north side of the island, in deep water, and erect booms. The whole plan was elaborately drawn up by Mr. Sippell, Government Engineer. It represented an expenditure of \$140,000. Mr.

Mackenzie would not entertain it. Some provision must be made for this trade, which is as necessary to the city as bread and butter to the people.

General Newton.—You are speaking of the retail trade?

Mr. Donovan—Yes, sir; and we might make it a depot where the Americans could come and buy their timber. We might make it a great market place, and at the same time a safe storage at a place where it might be taken out with ease. The grand point is to attract trade, and to establish this as the place for the sale of timber. We have to leave timber away up as far as St. Ann's, for want of accommodation, strewn along the beach. By a decision recently rendered by the Harbour trust, we have to pay a royalty for mooring rafts to the shore. There is a Trinity House law compelling us to keep the beach free, and we cannot put rafts out in the channel. They must be put near the shore, and when the water falls they get aground. It is an injury to the interest of the country and the citizens engaged in the lumber trade. It puts the lumbermen to expense and danger when the rafts break loose and go over the rapids.

General Newton—Is this lumber sawn or in logs?

Mr. Donovan—You understand, that which comes in boats is sawn lumber; there is every provision made for that; but what accommodation is wanted, is for lumber that comes in rafts.

General Newton—All your objection applies to want of room for logs?

Mr. Donovan—For rafts,—that is, logs as well as sawn lumber, because we have a large quantity of sawn lumber rafted to this market. I, myself, have had three and a half millions in one raft, and that I had to land on private property. There is only one place where I could land between the lower locks and St. Gabriel lock.

Mr. Bell—What you want is, a large surface of still water?

Mr. Donovan—Yes, sir; so that it could winter in safety, if required; and, in my humble opinion, there is no better space than the Nuns' Island, if communication was formed with the canal.

Mr. Bell—You want, then, to float it into the canal. You want a large floating space for storage, and as to your retail yards, as they are private property, you don't ask anything for them?

Mr. Donovan—Oh, no; it is to supply the mills; of course there are mills as high up as Cote St. Paul.

General Newton—How would Point St. Charles do as a location?

Mr. Donovan—I am afraid it is too low down. We would prefer it away higher up. We (the Harbour Commissioners) are not allowed to expend money beyond Windmill Point. There is an Act passed prohibiting the expenditure of money beyond. I believe it was done, through jealousy, by the east end people, who thought they were being neglected. Sir George Cartier, who was representative of the east end, showed every partiality towards them, and got the law; in fact, there was an injunction. Mr. Young forced the improvement for Windmill Point, and there was an injunction taken out to restrain him from spending any more public money, and an Act was brought in

prohibiting the Harbour Commissioners of that day from going beyond the outlet of the Lachine Canal. I know we had a deal of joking as to where the outlet was, and it is now decided to be at Windmill Point. We would prefer, if we could have it, to have booms placed higher up. The lumber interest would prefer to have that improvement at Isle Dorval. It is above Lachine.

In answer to General Newton :

We would prefer to have connection with the canal above St. Gabriel Locks. It is essential that communication should be had with the canal for the accommodation of this large trade. This boom would make the labour, expense and danger less. By erecting it we should not need to run the rapids. In low water it is dangerous to go over the rapids; rafts could come down the canal from Lachine, run into the great basin, and they could remain there until they were required, then bring them back the same route and down the Lachine Canal to the city. The Government would have to provide us with a slide for hauling out, in the canal below St. Gabriel Locks.

General Newton—What do you want a slide for?

Mr. Donovan—To haul out timber and logs.

General Newton—A dry slide?

Mr. Donovan—Yes sir; the main point is, we want safe storage room and winter quarters. We have no safe storage for timber. We have the wharves, it is true, to land from barges, but we have no accommodation whatever for rafts. I gave up the timber trade for the very reason that I had no facilities for getting it out and storing it. We have a boom, it is true, but that does not hold one-twentieth of the quantity required for the city. People will leave the timber in the boom; it is occupied now with a stock that will eat itself up in boom dues. Last year a deputation went up to Ottawa, to ask the Premier to give us accommodation—after the lumbermen had been fined \$80 by the Harbour Commissioners for encroaching upon the rights of private individuals on the beach of the Ottawa. When the inhabitants found the law was in their favour they refused to grant the privileges without being paid a royalty. The lumbermen had a meeting, and appointed a committee to go to Ottawa, and to represent to the Government the absolute necessity of erecting works, on the plan of Mr. Sippell, at Isle Dorval, by purchasing the right of the island, or purchasing the island entirely, and erecting booms and piers suitable both for winter and summer storage. There is plenty of water and shelter out of the channel. The deputation was received very respectfully by Mr. Mackenzie, but he could not entertain the plan. It is my humble opinion, booms could be made at Nuns' Island, provided communication could be had with the Lachine Canal. That would make all the accommodation required; but the inlet to the canal should be above St. Gabriel Locks, so that when the rafts arrived at Lachine they could be brought down the canal and enter into the timber basin. Let there be a charge per thousand feet per month—that would yield a good revenue, and it would become a large depot for the sale of timber, and Americans

would take advantage of frequently purchasing here. It would be a great accommodation to the country at large, and for the foreign trade of the country also.

Mr. Bell—If you had a depôt at Nuns' Island, you would float your rafts down the river?

Mr. Donovan—Yes; when the water is at sufficient height.

Mr. Fleming—How would it do at Lachine?

Mr. Donovan—There is no accommodation at Lachine; it is private property, and there we would have the whole range of the lake. It would require a breastwork or breakwater to protect rafts from high winds.

Mr. Fleming—You would want to make a connection with the Lachine canal, and why?

Mr. Donovan—Yes, sir; by erecting piers at the lower end of Nuns' Island. There is a large space of water there, and, I believe, the ice never shoves to any extent in that locality; but that will have to be ascertained. I believe the ice forms smooth on the surface, and melts away in the spring, so that by putting piers out at the lower end it would hold immense quantities, and then booms would be stretched out capable of holding millions of feet of timber and lumber. A canal could be cut from there to the Lachine Canal, which would give immense facilities, at the nearest point to the St. Gabriel locks. We would come down the canal and go right into the boom, where if the timber was not wanted at the moment, it could remain.

In answer to Mr. Fleming,

Mr. Donovan said: Perhaps the rafts will require to be locked up to the level of the canal, but I think one lock will be sufficient.

General Newton—I take it for granted you will have to lock it, but that does not make much difference.

Mr. Fleming—Is it necessary to get back into the canal?

Mr. Donovan—It is necessary; in order to supply the mills above, you would have to take the timber to the canal?

Mr. Fleming—Unless it would do to go round the river?

Mr. Donovan—But suppose that timber was required for mills above St. Gabriel locks? But I have not thought of that before; we could, I think, go down to the mouth of the canal, and lock up.

Mr. Bell—How?

Mr. Donovan—Go through the bridge to the mouth of the canal. That connection, by a cut, could be avoided by coming down from Nuns' Island and locking; but, of course, there is always some risk in going through the bridge. There is risk with both timber and lumber. Rafts are very unweildly and bad to manage; that is the only difficulty. If we could get, by the abutment of the Victoria Bridge, a good safe passage through for rafts, we should be all right.

Mr. Fleming—Could you not put out a boom from one of them to be a guide?

Mr. Donovan—It would be difficult to keep a boom there.

General Newton—Now you have stated that you could get into the canal from below; I come back to my previous question about Point St. Charles?

Mr. Donovan—The most of Point St. Charles is occupied for Grand Trunk purposes.

General Newton—I am speaking about the water?

Mr. Donovan—You must have a canal to supply water for Point St Charles if you go on with that improvement here, docks were intended to be erected. There is a large area of ground there, but it might be put to more beneficial purposes; of course rafts would not require such an outlay of money. This space below the bridge could be turned to more useful purposes, instead of accommodating timber and lumber.

General Newton—If it was ever acquired for shipping, that would?

Mr. Donovan—Until it was required for shipping, it would be well to utilise it for rafts, but, at the same time, it would require considerable outlay.

General Newton—What depth of water do you require for these rafts?

Mr. Donovan—Three feet, or 3½ feet at most.

Mr. Fleming—I understand you to say, you have no difficulty in bringing your rafts down this branch of the Lachine Rapids?

Mr. Donovan—I think there would be difficulty in low water. There would not be any difficulty in high water. The rafts generally come down in the months of June and July. The water commences to fall about June. I have received rafts during the whole of the summer; but when it is late they don't like to come. When the water gets low, they send but little rafted lumber, as a general rule, on account of the expense. The culled lumber brings low prices, and cannot bear extra charges for transport.

Mr. Fleming—Rafts coming down the canal would interfere with other uses of the canal. If there is any difficulty in running the Rapids, would it not be best to make a slide by the side of the bank of the canal for rafts?

Mr. Donovan—Well, of course. I know when there is a deal of navigation, rafts have got to stand by. I have been myself often two or three days waiting for them to come down; because if boats are in sight, they have to stand by; they won't let them through the locks.

Mr. Bell—Then the lumbermen feel that inconvenience?

Mr. Donovan—Yes, sir; because towers will not tow rafts unless they get compensation for loss of time. I think the less the rafts have to do with the canal the better; but the canal has to be used in the meantime.

Mr. Fleming—To some extent?

Mr. Donovan—To some extent; and, I think, by a little improvement, the Lachine Rapids could be improved on the north side for rafts to descend from Lachine in safety. It would be the best course to take, if booms were made at Nuns' Island.

Mr. Bell—That appears a very simple plan?

Mr. Donovan—Yes, sir.

Mr. Bell—Is this the only point where there are rapids?

Mr. Donovan—Where there is swift water.

Mr. Bell—This is the only point to get the better of?

Mr. Donovan—They might descend down on the north side of the rapids. I look at the Victoria Bridge as an impediment to reach the lower entrance of the locks; but we could have glancing booms, so that rafts could not run on the piers. If glancing booms were erected, they would be guides for rafts. I think that would prevent it. Rafts don't require much more than three and a-half feet of water; that would be sufficient for any raft. They can go along by the shore, and these glancing booms would prevent them from striking against the bridge, and going out. You would be able to go through here and get to the outlet of the canal, and from thence tow up the canal. A great deal passes through direct to foreign markets. It will not do to have the canal full of timber. The ice commences to work up from the lower part of Nuns' Island; it freezes level there. The pressure comes from the bridge, because the abutments prevent it coming up from below. I don't know the action of the ice, but that you could ascertain from people living in the locality. Mr. Young could procure you all the information you desired on that point. My own opinion is that rafts should be accommodated lower down—the lower down the better—because you can get more protection.

Mr. Fleming.—How would it do down at Hochelaga?

Mr. Donovan.—It would not do at all there, for the reason that ice shoves furiously, and you have to take lumber out; you want space where it can lie or float in summer; there is only one point, and that is Nuns' Island, and the grand point of having it there is, you don't fulfil the requirements, as it will only be timber required for local purposes that will have to come down the canal. Those that want to take it to Quebec or the States through the Richelieu, will not go into the canal at all; they will go into the boom.

Mr. Fleming.—Where does this lumber go at present?

Mr. Donovan.—It lies at Lachine, and all the way from there scattered along the beach to St. Ann's.

Mr. Bell.—Timber for Montreal?

Mr. Donovan—Yes; but we have to pay royalty; I had to pay \$18 for one raft this present season for anchoring at St. Ann's; they will not allow us to moor it on the shore, and we could not anchor it in the current for fear of being thrown adrift. Last year there was a man lost, a raft worth \$10,000; the expense of gathering up the drifting timber is very heavy.

General Newton.—If I understand you rightly, there are no rafts that come down the St. Lawrence to go to Quebec?

Mr. Donovan.—They do.

General Newton.—But it is dangerous?

Mr. Donovan.—In low water it is; these rafts that have to come down from the

head of Lake Ontario have to do so at great risk and danger. It is only by sufferance that we get the privileges of the canal. The predecessor of the present Superintendent of the canal told me he would not have a raft in at all if he had his own way. These improvements are not only of interest to dealers hereabout, but manufacturers in Upper Canada are interested. If there were sufficient storage, they would send their lumber here for sale, and take time to look out the most favourable market.

Mr. Bell—How much water is occupied with rafts in winter? I suppose there is more in winter than in summer?

Mr. Donovan—No; there is more in summer, when the rafts are accumulating. Of course, in winter time, every mill owner or dealer in timber tries to get his season's stock hauled out, and placed within easy reach of his saw mills. In spring, after navigation is open, the rafts arrive, and get down in about a month or six weeks, and require a large space.

General Newton—How many acres do you need?

Mr. Donovan—Take the whole space between Nuns' Island and the main shore; I think that would be sufficient. The whole of this water space between Nuns' Island and the south shore of Montreal Island would do. In order that timber rafts would not press on each other, you would have to provide against the stress from the outside.

Mr. Bell—Who has a right to grant this?

Mr. Donovan—We would have to acquire privilege from the Nuns; but with respect to the piers, I think the Government have rights to the water space. The Harbour Commissioners have no right to expend a dollar of money but by permission of Parliament; but we can acquire that. The Government can do it; but I don't think they are inclined. I think it comes within our jurisdiction, but we have no right to improve it. We have no right to spend money. This (the Nuns' Island) is the only available spot of accommodating that branch of trade. A canal would be desirable if it was not so costly; at the same time, we should require locking, but that can be obviated by the fact that a tug can bring the rafts down to the mouth of the canal from the timber basin, and lock up.

Mr. Bell—Do you want a boom across there?

Mr. Donovan—Nothing but a boom; there is no great outlay required. We want piers and booms—piers, and booms to be stretched between. They will be a defence against the weights of these rafts pressing against each other. We want to acquire right to moor them fast; that would prevent pressure upon the lower point.

Mr. Bell—That is about your rafts, now about your cut lumber?

Mr. Donovan—The cut lumber for Montreal is landed along the basins there on the margin of the canal; the South American trade is accommodated at Hochelaga. Our enterprising merchants ought to try and cultivate the West India trade in lumber by securing return cargoes of sugar, &c.; but trade has not moved in that direction yet. I think there is enough accommodation for that trade at the present time, but

the further down you get them the better it is for the general traffic of the harbour. I think there is sufficient accommodation for the local retail trade in sawed lumber at present. There is plenty of room down there for the Northern Colonization Railway. I don't think there can be any question about that—that we have room for four times the trade we have just now. There is a very large area unoccupied; the great want is the want of storage; and I think you have a pretty good idea of our difficulty for want of storage accommodation for rafts.

In answer to General Newton,

Mr. Donovan said—If they could get accommodation to leave the rafts, they would not go by this point until a market was obtained. They might be sold here, and then they would not want to go elsewhere to transact sales.

Mr. BUTTERS, representing the Grain Trade.

Mr. Bell—Can you give us any information on the matter of harbour accommodation?

Mr. Butters—I don't know that I can give you any information beyond this; that we want to get more space in the harbour as near the city as possible.

General Newton—You want more breast wharf or piers?

Mr. Butters—Piers or breast wharf, so long as we get accommodation for sea-going vessels.

Mr. Bell—What is your principal business?

Mr. Butters—Export altogether.

Mr. Bell—Grain and produce?

Mr. Butters—Grain principally. I occasionally have cargoes of coal, but that I don't consider a part of my general business.

Mr. Bell—We have heard a good deal about the grain trade, and the present way it is worked by barges, and the disadvantage of their having to wait until vessels are ready for them, and we have been making enquiries as to storage, whether it will be proper to provide stores for this trade?

Mr. Butters—It would be a great convenience, and the means of saving a large amount of money to shippers of grain.

Mr. Bell—Do you think if storage was provided it would be utilized?

Mr. Butters—If it was possible to give us warehouses anywhere below the canal there would be use for them all the year.

Mr. Fleming—To what extent?

Mr. Butters—To the full extent of their capacity.

Mr. Bell—Can you state what quantity would lie in store at one time?

Mr. Butters—Do you refer to grain?

Mr. Bell—To grain at present.

Mr. Butters—One great difficulty is the delay in bringing our grain from the present warehouses on the Canal Basin above the locks. Before we can get grain brought down it sometimes takes several days.

Mr. Bell—Has that grain been brought by railway or barges?

Mr. Butters—Part by rail and part by barges. There are seasons that we have a large surplus of grain from Canada and from the Western States, which must go into warehouse if there is not tonnage to meet it; I, myself, have had stuff in store for twelve months for want of facilities to bring it from the canal; now, with a warehouse anywhere on the river side, where vessels could go alongside and get loaded, grain could be loaded into vessels without barging from the canal basin, and thus save time and money.

Mr. Bell—Where does the delay occur in taking it from stores and barging it down to vessels?

Mr. Butters—We have no warehouses that will load more than one barge at a time; if I put a barge alongside a warehouse at seven o'clock in the morning, I don't get it down into the harbour until the following morning, and the delays are the same going up into the canal as coming down; some of our sea-going vessels will carry 60 or 70 thousand bushels, and the time occupied in barging that quantity is thus very great. There is another difficulty, we have not barges suitable for this service; all the grain craft we have are employed between Kingston and Montreal.

Mr. Bell—And you have to take your chances at getting them?

Mr. Butters—It is impossible to get them in a busy season; we cannot get them at any price.

Mr. Bell—Can you give any idea of the quantity that would be stored, taking the present trade?

Mr. Butters—It depends so much upon the season that it would be hard to give you any definite information on that; I can tell you what I did a year ago. I loaded a quarter of a million bushels of grain at Chicago and Milwaukee, and stored it in warehouses at Port Dalhousie and Port Colborne, also in canal boats at Kingston. Now, if I had had accommodation here, such as I talk of, where I could send a steamer at opening of navigation alongside and load, I could have brought down here all the grain I could find money to buy, and would have stored none outside of Montreal. At the time I talk of, twelve months ago last May, I had in store here, and in store at Port Colborne, and in canal barges at Kingston, 250,000 to 300,000 bushels of grain. At that time it would have been impossible, with the present accommodation, to float that stuff out to suit vessels in the harbour, so I had to store it above Kingston and the other places I have mentioned, and bring it forward by canal barges. If we had been able to bring that grain forward, and put it into a warehouse on the wharf, it

would have been done, and vessels would have been loaded from such warehouse in 48 hours

Mr. Bell—Then that trade would increase very much with facilities for storing?

Mr. Butters—My idea is it would. We should be able to store in winter, where sea-going vessels can load at opening of navigation, without being obliged to barge it from warehouse. The steamers arriving here early in May must be loaded without delay, and freights, as a rule, are low—say 3s. 6d. to 4s. 6d. per quarter. These low rates continue until Western grain arrives, say about the 15th May, when freights advance to about 6s. and over.

Mr. Bell—Some people tell us the margin of profit is so small against New York that it will not pay them to store grain?

Mr. Butters—Well, the present system is so expensive, we cannot afford to store grain. It costs not less than one cent and a half per bushel to float grain out of store into the harbour, to pay for lighterage and insurance; while in New York they store it for one cent a bushel per month, here we pay one and a-half cents, in addition to floating charges. There are no charges for floating in New York. The vessels go alongside the warehouse, and take in their cargoes there. We have got to float it down from the canal basin.

Mr. Fleming—What does that cost?

Mr. Butters—We calculate it at 1½ cents a bushel, in addition to the charge of putting it into the warehouse; but the difficulty is not so much putting it into the warehouse as getting it out again.

Mr. Bell—And you cannot get it out at the time you want it?

Mr. Butters—No; we cannot begin to store it with the object of waiting until vessels come here.

Mr. Bell—Some gentlemen say it is cheaper to store in barges?

Mr. Butters—There is no doubt it would be in summer, when vessels are always in port.

Mr. Bell—And you can move it from Kingston here?

Mr. Butters—Almost all grain is transhipped into barges at Kingston, and forwarded in these barges to the ship's side.

Mr. Bell—That is what they mean?

Mr. Butters—There is no object in storing grain in warehouses on the canal, unless for milling, during the shipping season; it is only at the close of navigation. Barges could not be used for this purpose.

Mr. Fleming—Let me know the use of storing it at all in any season?

Mr. Butters—We are obliged to store it, if there are no vessels to take it, or buyers for it. With a warehouse on the wharf, all the expense of barging it would be saved. In all cases, when barges arrived from Kingston, or propellers from Chicago, grain could be stored in a warehouse on the wharf at a small cost, and sea-going vessels loaded without delay.

Mr. Bell—Would that be extensively done ?

Mr. Butters—I think it would be done altogether.

Mr. Bell—Then in winter the storehouses will be filled ?

Mr. Butters—The storehouses I speak of would require to be out of danger from ice ; I have no doubt they would be filled in the fall of the year.

Mr. Bell—And in summer time filled to a considerable extent by taking grain from barges ?

Mr. Butters—I think so. Had we such a warehouse on the wharf, grain would be moved freely in mid-summer, and stored, waiting the arrival of vessels ; at present we cannot risk bringing it forward to put it into store, as when it gets there, the chances are it remains, if the barges are employed from Kingston to this. Steamers are being constantly chartered in England to come out here during open water, and grain purchased in the Western States to load them simultaneously. In New York it is different, as grain can be purchased there at all times.

Mr. Bell—But if the same facilities existed that exist in New York would you have the same trade ?

Mr. Butters—If the same facilities existed here as in New York for the same trade, I don't know that we should have it to the same extent. Three years ago one or two gentlemen, along with myself, wanted to fill up two or three warehouses with corn ; all our warehouses were full, and the only available place was the storehouse on the wharf belonging to the Government, but this, of course, we could not get. I am speaking now of when grain was very cheap, and would pay to carry it over. In talking of space in front of the city, I may as well mention that from the canal, where the mills are situated, we can cart down flour to the Island Wharf for five cents per barrel ; if it is taken to the Victoria Pier it is ten cents ; if we want it taken to Monarque Wharf, we can scarcely get it carted at all.

Mr. Fleming—These carts are one horse carts—are they not ?

Mr. Butters—Yes ; carrying eight barrels.

General Newton—Why don't you have large trucks ?

Mr. Butters—It is done very much better by the small carts now in use. I thought once we ought to have two horse trucks, but find, from experience, the trucks in use do the work better and quicker. They back their trucks up to the warehouse get their load, and when they reach the pier dump it, and start on the return ; a man does not require any aid to load or unload. I never saw carting done more expeditiously and cheaply than in Montreal.

General Newton—And you have had wide experience ?

Mr. Butters—Yes ; in this city twelve years, and also in Glasgow ; with these large trucks we could not handle flour at all ; in fact, you could not get labour to handle it,—there would be too much lifting.

General Newton—Where is the principal flour trade with ?

Mr. Butters—With the Provinces.

General Newton—You don't send much over to the other side?

Mr. Batters—We send largely, but the principal trade is with the Provinces.

General Newton—Has the flour trade increased of late years?

Mr. Batters—I am not able to answer; it has increased. I cannot say how much. We have now six steamers going to the Lower Ports, two steamers a week, besides schooners. Ever since Confederation this trade has greatly increased.

General Newton—In case these lower canals were not improved, would it be im possible to bring large propellers through without breaking bulk at Kingston?

Mr. Batters—The propellers we have now can go through the lower canals with 13,000 bushels. My firm have five propellers. We don't load them beyond 8 feet 8 inches or 8 feet 10 inches; but with very little increase of depth, I should say, if we had ten feet of water in the lower canal, we could bring all the grain we want for the next ten or fifteen years.

General Newton—Without breaking bulk at Kingston?

Mr. Batters—We must break bulk at Kingston, with the canals as at present. Propellers now carry 18,000 bushels, when loaded. We are obliged to take out 4,500 bushels at Kingston, for lack of water forward. This comes in barges.

General Newton—And you bring the propeller all the way with the reduced cargo?

Mr. Batters—Yes; and she takes her up-cargo from this. The present harbour of Montreal, without warehouse, is very much against the trade being done by propellers. There is no accommodation to unload in the harbour, unless into sea-going vessels. Even these small propellers cost \$110 a day while in commission. It is a question of despatch whether they pay or not. If you keep a propeller in the harbor for four or five days no ordinary freight would pay her.

Mr. Bell—But if you could at once discharge into a store, it would?

Mr. Batters—Yes, sir; and it would be a very great advantage.

Mr. Bell—Then, if you had storehouses, it would be policy on the part of the Government to increase the capacity of the canals?

Mr. Batters—Yes, sir.

Mr. Fleming—And you would bring propellers from the West, without reducing cargo?

Mr. Batters—Yes; a propeller must come here to receive up freight, but at present must discharge part of her cargo at Kingston, as she cannot go through drawing more than 8 feet 8 inches to 8 feet 10 inches; this season scarcely over 8 feet.

Mr. Fleming—When they come with reduced loads are they detained?

Mr. Batters—Yes, sir; I have no doubt to-day you will find propellers that have been in the harbour or canal two of three days discharging, when eight hours would discharge them into a warehouse.

Mr. Bell—What capacity of storehouses would be needed?

Mr. Batters—About 125,000 bushels; but, I think, one large storehouse, the same as

they have at Chicago or Milwaukee, holding half a million bushels, might do all the business for ten years to come, if on the river-side in the harbour.

Q.—How is it with regard to vessels coming with general cargo; they would require to be partially filled by canal boats, before being unloaded?

Mr. Butters—We cannot work them any other way; we brought up the "City of Manchester" the other day, from Hochelaga, where she discharged her coals; we gave her 12,000 bushels grain to ballast her up to Island Wharf; if there had been a warehouse we could have run her alongside and loaded her; if we could do our work in this way we would keep a stock of grain on hand; as it is, we don't keep a load.

Mr. Bell—Would you put warehouses about here, where the general cargoes are brought, or lower down—which is the most advantageous?

Mr. Butters—For general cargoes, immediately you go beyond Victoria Pier the question of cartage comes in; it becomes a very heavy item.

Mr. Fleming—Steamers come here generally with general cargoes?

Mr. Butters—Our regular steamers bring general cargoes; a great many chartered steamers come here with full loads of either railroad iron or coal.

Mr. Fleming—Those steamers could be loaded at Hochelaga?

Mr. Butters—It is too far away, if it is possible to have it nearer the city.

Mr. Fleming—Below Victoria Pier then?

Mr. Butters—Yes, sir.

Mr. Fleming—Then you would have two storehouses, one for vessels with general cargoes, and one for vessels with special cargoes?

Mr. Butters—If we had warehouses similar to those at Brooklyn, it would overcome all the difficulty at the canal, and permit laying in stocks of grain.

Mr. Fleming—You have seen the one at Buffalo?

Mr. Butters—Yes, sir; that is what we want.

Mr. Fleming—Your idea is this, if I understand it, the vessel brings out a general cargo. After discharging, she comes alongside the storehouse of grain, gets her return cargo and goes to sea?

Mr. Butters—Yes; such a warehouse would avoid the delay of propellers, and would attract more vessels to the port, and enable us to do the trade with greater ease and bring in more money.

Mr. Bell—As you go on you could build more warehouses?

Mr. Butters—I have no doubt it would grow.

Mr. Fleming—Would it be much cost moving a vessel from her pier to the storehouse to take her cargo?

Mr. Butters—No, sir.

Mr. Fleming—Some gentlemen think it inconvenient?

Mr. Butters—It would be inconvenient, but it could be done. We have steamers that come here that will not do it at all. We were obliged to give the "City of Manchester" 12,000 bushels at Hochelaga before she could be brought up. We had to take

it down in barges. There are many steamers that will not move; these transient steamers that come here I do not think would shift.

Mr. Fleming—Then you would require storehouses on every wharf?

Mr. Butters—No. For the grain trade I think one storehouse on the river side, of the capacity of 500,000 bushels, would do the business in Montreal for some years; at present it frequently occurs propellers arrive at Montreal, and no vessel is ready to receive her cargo, but with a warehouse on the river side the cargo would at once be stored. In my opinion this would do much to increase the carrying trade of the St. Lawrence, as with a stock of grain in a warehouse, where it could be had when wanted, and at little expense, much of the grain which now goes to New York, via Oswego and Buffalo, would come this way. They bring grain here and store it one month, and to float it from the warehouse at present on the canal costs, per quarter of 480, one shilling sterling per quarter.

General Newton—Would there be much flour stored?

Mr. Butters—No, not more than is now stored; a large part of the flour business is now done by small schooners loading at the mills in the canal. A storehouse for general cargoes, between the steamship sheds and Victoria Pier, would be of great service to importers,—but for grain and flour it is not wanted. If such a Warehouse or Elevator, as I have already mentioned, was built in the harbour, as near the Custom House as available, a site could be found. There is one thing we want very badly, and that is, higher piers. In the spring of the year the inconvenience and loss is considerable from being overflowed.

Mr. Bell—Would this not be inconvenient to you during the summer?

Mr. Butters—Not at all.

Mr. Bell—How much higher?

Mr. Butters—Two feet, it appears to me, would give us safety in spring. We also require to have still water, as well as depth, while loading grain vessels.

Mr. Bell—With regard to milling in Montreal, what are the prospects. I think it has been said by one gentleman, who has a lease of some of the water of the canal, that one half was yet unleased?

Mr. Butters—I don't think that is so. All I can say is, that we have for four years been the lessees of the Royal Mills, which formerly belonged to Grant, Hall & Co., and every season we have been running, and during the last thirty days we have been shut down two or three days a week for want of water. I am not aware of any power on the canal to be had at present for milling purposes.

Mr. Bell—Then you are working to the full capacity of water?

Mr. Butters—Yes, sir; we pay Mr. Frothingham \$1,080 a year for water power at Cote St. Paul, and only pay \$430 a year for a like water power at Royal Mills, which is leased direct from the Government.

Mr. Fleming—You take the lease direct for one place, and not for the other. Would you have use for more than you have got? Is it required, or would it be required?

Mr. Butters—I think it is not worth very much.

Mr. Fleming—You don't attach much importance to that?

Mr. Butters—No, sir? I don't think it of much importance at all.

Mr. Fleming—You don't think a large addition to the water power necessary at present.

Mr. Butters—No, sir, I do not, and I don't think it ever will be.

Mr. Bell—How is it for other purposes besides milling?

Mr. Butters—There are one or two iron works; I believe they are about to give up the use of water power, and go into steam, and for one reason alone; they have at all times fires going; they can utilize the fires to make steam. There are no other branches of trade that I know of that want water power very badly.

Mr. Bell—But if water power, to the extent of ten or twelve thousand horse-power, was available, do you think it would attract users?

Mr. Butters—I do not.

General Newton—The most of the flour that you export from Montreal comes from other places.

Mr. Butters—Yes, sir; and we could not use much more water power for flour mills; at present we make more than there is demand for; cannot give an opinion as to other manufactories, but where they have fires continually going, I don't see why water power is of any use at all. There is no doubt, when we have facilities at this end for unloading barges, as at Buffalo, that the trade in a few years would be done by propellers and barges; many propellers now have one or two barges; one Buffalo propeller carries 45,000 bushels; along with her she has one or two barges, schooner-rigged, with jury mast, and they take from twenty-five to thirty thousand bushels each.

Mr. Fleming—Tow them through the lake?

Mr. Butters—Yes, sir.

General Newton—If the canal was improved you could get them through to Montreal.

Mr. Butters—Yes, sir. I have no doubt the trade will be done, before long, by barges and propellers. By sail, we don't calculate on having a cargo of grain here short of thirty days from Chicago. Now, our propellers don't occupy more than twelve days from Chicago. In the case of large propellers, with or without barges, doing the trade, it would be necessary to have storehouses on the river-side. At present, I may say our canals are not taxed to their capacity, owing to want of tonnage in the port of Montreal. Our great difficulty is, want of a sufficient number of sea-going vessels.

Mr. Fleming—The next question is, whether you could give large propellers and barges return freight, to make it profitable to come here?

General Newton—Well, then, between these questions stands the growth of your grain trade.

Mr. Butters—Well, suppose a propeller carrying 18,000 bushels, at a cost of \$110 a day, a propeller carrying 45,000 bushels would be run on not more than \$150 a day,

and have in tow two barges of 20,000 bushels each, making her own load, with her barges, 85,000 bushels. They can afford, under such circumstances, to bring it at half the price, against a vessel that has only 18,000 bushels, and make it profitable, without taking return freight into account.

Mr. Fleming—I would like to ask you a few questions, leading up to the probable extent of storehouses wanted to meet the trade of Montreal. About what was the quantity of grain exported in any one year heretofore; take last year, which I assume to be the heaviest year?

Mr. Butters—I ought to be able to answer that, but I could not tell within a million bushels. My own impression is, it is from twelve millions to thirteen millions. It might be fourteen millions.

Mr. Fleming—Now, if you had your own way of shipping, would you do it in the way you describe. How would you do it, and what percentage of the whole would go into store?

Mr. Butters—If I was to do the business as I want it done, immediately a propeller arrived in Montreal with grain, if a vessel was ready to receive it, we would give it to her; if not ready, we would put it into store at any point below the canal, where it could be had without floating it in barges.

General Newton—You would not keep her a single day?

Mr. Butters—No, sir; not a moment. She cuts her head off the moment she lies idle. At present the charge is $3\frac{1}{2}$ cents a bushel for bringing grain from Kingston to Montreal. It does not pay a barge to lie here for two weeks or thirty days. It would be very much cheaper to put it into store. It is better to store grain, as it gets out of condition by lying in barges in the canal in summer. I think if we had storage for half a million bushels outside the canal, or, for an experiment, give us storage for a quarter of a million, I think it would be occupied all the season of navigation; and there is no question, whatever, but that it would be full at the end of each season, for the commencement of the following spring.

Mr. Bell—Suppose you look forward to a time ten years hence, and everything goes on well, grain trade increases, what extent of storage do you imagine will be sufficient?

Mr. Butters—Well, I should say the business during the next ten years will increase fifty per cent. at least. I don't know what it will be in ten years hence, but I think it will increase fifty per cent.

Mr. Fleming—If you had now a storehouse of the capacity of a quarter of a million bushels, in ten years hence one capable of holding half a million would be quite enough.

Mr. Butters—I think it would; the store I want is merely as convenience, and with half a million bushels store capacity, we would not have any anxiety to forward stuff to meet the vessels coming; we could afford to put it into store, and wait for a few days. I am talking of steamers we charter to come here for cargoes of grain.

For instance, we have a steamer in this morning, chartered three weeks ago. If we had been obliged to bring forward a cargo for her by propellers, there might be a great loss of time to the propellers; whereas, if there was a warehouse on the river side, the propeller's cargo would be stored, and the propeller let go. We would be better off with two warehouses than one.

Mr. Bell—Do you think it should be done by private individuals?

Mr. Butters—If the Government would give me a piece of land, I would find money to build a warehouse.

Mr. Bell—If basins were arranged, and sites for warehouses, do you think private parties would take up the storerooms?

Mr. Butters—Yes, sir; if there were not individuals you would have companies to do it.

General Newton—Ships with general cargoes, and of railway iron, from England, have to be freighted with grain?

Mr. Butters—Nearly all the vessels leaving this port take full cargoes of grain, or grain and flour—a few vessels take lumber cargoes; all the steamers take cargoes of grain or grain and flour; on the opening of navigation it frequently occurs there is little grain in store here, and great difficulty is experienced in loading the early steamers. Grain from the Western States cannot be brought here until about the 20th or 25th May. With warehouses below the canal basin, I am convinced grain would be brought here in the fall and held over winter, and with a stock of grain at the opening of navigation, this would be avoided.

Mr. Bell—This only applies to the first trips—not the subsequent ones?

Mr. Butters—Not so much.

Mr. Fleming—To transient vessels it applies all the time?

Mr. Butters—Nearly so; I think the Molson's Wharf might not be any too far down.

Mr. Bell—Below Victoria Pier?

Mr. Butters—Yes; an elevator where vessels could be loaded, is, in my opinion, what is wanted.

Mr. Bell—On the bank, in the neighbourhood of Molson's Wharf?

Mr. Butters—Yes, if nothing nearer could be had.

Mr. Bell—Have you watched the ice shoves?

Mr. Butters—I have seen one.

Mr. Bell—Do you think, if a wall was carried from this point, at the abutment of Victoria Bridge, in front of the harbour, as high as the revetment wall, that would protect the harbour from the ice shoves?

Mr. Butters—From what point?

Mr. Bell—From the end of Victoria Bridge as far down as Victoria Pier, as high as the level of the street?

Mr. Butters—I think it would.

Mr. Fleming—You have seen a shove ?

Mr. Butters—Yes, sir.

Mr. Fleming—A good one ?

Mr. Butters—I considered it a good one.

Mr. Fleming—It raised itself across the channel ?

Mr. Butters—It did.

In answer to a question

Mr. Butters said if the Caughnawaga Canal was opened it would attract a part of the carrying trade of the New England States ; at present Montreal does not get any of that trade.

General Newton—On account of the duties ?

Mr. Butters—Yes ; the United States duties discriminate against us as carriers.

MR. JOHN HALL, Montreal Transportation Co., representing
the Grain Trade.

There is an opportunity here to make as fine a harbour as any in the world ; I should like to see the harbour so built that you could add to it as the wants of the country demanded ; and I should like to see it done on a large scale ; this point here I take a peculiar interest in, and always thought it a place that could be developed ; you have a large amount of room at Point St. Charles,—either to extend this basin or build a large dock.

Q.—You suppose this basin could be connected with the canal ?

A.—Yes sir, they could use this waste *weir* up here ; because there is a channel here running towards it ; it requires very little deepening to make it of use.

Q.—These basins, unless connected with the canal, do you think they should be high water basins ?

A.—Well, make them level with the river ; if you build a big dock, make it level with the present canal ; but, if not a very big one, make that level with the water in the harbor.

Q.—How would you appropriate these basins ?

A.—Warehousers and merchants, you will find, want a deal of room for coal and stuff from the lower ports. Have warehouses on them, if you choose, but you will have to build a wall on the outside to keep the ice off in winter.

Q.—But in all the evidence we have had before us, they have said the business portion of the town must be in close proximity to the Custom House, and that would rather remove this. They have said that ships coming here with general cargoes have to be discharged here ?

A. I suppose it will be more convenient, and vessels do not, as a rule, like to shift their berths. If you choose to make one large dock it could be on a level with the Lachine Canal, and fed from it; that is a scheme that was talked of some years ago.

Q. If you build a large dock there, why not get it on a level with the harbour.

A. The trouble is, you would have to excavate; that is all rock bottom.

Mr. Hall pointed out on the map whereabouts he thought the rock commenced. He also pointed out the place where the present basins are being made, and continued:—

That is to be 300 feet wide; you don't meet the Islands. If you make this large basin, as a matter of course you could bring it out to the present waste weir.

Mr. Bell—Suppose you continue that wharf right down to the Victoria pier, and enclose the whole of this?

Mr. Hall—Well, if you connected it with this, it will give you plenty of water to connect it with the Lachine Canal.

Mr. Bell—Suppose you brought a pier down here, along the front of the harbour, and enclose it with a wall, that will give you a harbour down here. This wall would have to be made as high as the revetment wall.

Mr. Hall—Well, sir, that idea would do very well.

Mr. Bell—Can you describe an ice shove?

Mr. Hall—Yes, sir, I can describe the largest I ever saw.

Mr. Bell—Was that before or after the Victoria Bridge was built?

Mr. Hall—Before; in either '37 or '38. The ice came up, and I marked my name on the spout of a building that is at the corner of Port Street.

Mr. Fleming—Did it strike the building?

Mr. Hall—It kept piling up.

Mr. Fleming—How high?

Mr. Hall—About 30 feet.

Mr. Fleming—Which way did it come?

Mr. Hall—It came from the direction of the bridge; but the bridge was not built then.

Mr. Fleming—Was it parallel to the shore?

Mr. Hall—It came angling.

Mr. Fleming—Were there any mills there then?

Mr. Hall—No.

Mr. Fleming—Was any portion of the shove up in that quarter?

Mr. Hall—I don't recollect.

Mr. Bell—Then, suppose there was a wall there?

Mr. Hall—I have observed that after it piled to a certain height, then it would fall over—topple over. I have seen it come up to Mr. Gould's mill, on Mill Street. It came in, and wedged itself in sideways. There is no two years that it works alike.

Mr. Fleming—Since the bridge was built have you seen any shove?

Mr. Hall—Only at Mr. Gould's.

Mr. Fleming—In other words, these ice shoves on the snore attain their greatest height when they meet with the first obstacle, and there it stops if the obstacle is of sufficient strength to break the back of it.

Mr. Bell—How did the ice come in that time at Mr. Gould's ?

Mr. Hall—Sideways.

Mr. Hall next related an incident of flooding near his residence in 1862, and proceeded :—

I live somewhere here, opposite the head of Nuns' Island ; this jam seemed to give about the middle of Nuns' Island and back the water up to Greenshiels farm, where there was 35 feet of water ; that was opposite Isle Heron. The ice here (lower down) was strong enough to withstand the pressure against it. Laprairie was flooded also ; the water at the same time was not much above the ordinary level at Montreal.

Mr. Fleming—Does not the ice form under water ?

Mr. Hall—Yes, sir.

Mr. Fleming—We were told that between Nuns' Island and the North Shore was a good place for lumber ; that an ice shove was never known there ; that the water froze there, but that was no objection.

Mr. Hall—Well, I should not care about having lumber down there.

Mr. Fleming—Do you think lumber would be safe lying between Nuns' Island and the North Shore ?

Mr. Hall—No sir ; you cannot carry three feet of water there ; at the time they were building Victoria Bridge, we had to take horses into the water here to draw the timber ashore ; you cannot go round there in a small boat drawing two feet of water ; our warehouse is situated here ; this is at present the waste weir ; the supposition is to open that weir down, and if that is done, bring vessels up to these warehouses and load them direct, where I have now to spout it across the street to the present canal.

Mr. Fleming—How do you get there, in the first place ?

Mr. Hall—By rail. The building is laid out for water as well as rail.

Mr. Fleming—How does the grain come down, in bags ?

Mr. Hall—No sir ; in bulk.

Mr. Bell—What capacity is that store ?

Mr. Hall—700,000 bushels.

Mr. Bell—That is owned by the Montreal Warehousing Company ?

Mr. Hall—Yes, sir.

Mr. Bell—Intended specially for the railway.

Mr. Hall—Yes ; built for them.

Mr. Bell—If you had a storehouse down here, would you take advantage of it ?

Mr. Hall—I don't think so.

Mr. Bell—If you had a storehouse to discharge ships, would you ?

Mr. Hall—You would have to build it high enough, so that the spout would run one in seven.

Mr. Bell—If you had an elevator here would it be useful ?

Mr. Hall—It would be as useful as this is. My idea is, that you will have to carry the stuff to the vessel. You take one of these large vessels, they will not move ; you must lighter the vessel. Suppose you had a vessel chartered to take grain, it would be difficult to move it in the harbour. If she was unloaded here, it would be awkward. Take Allans' steamers, for instance, loading and unloading at the same time.

Mr. Fleming—It is your opinion that wherever the warehouse is placed grain will have to be lightered ?

Mr. Hall—Yes, sir.

Mr. Bell—With regard to your grain. What proportion do you send by rail and lighter to ships ?

Mr. Hall—It all goes by vessels, and all comes by rail ; we can take the same in by water.

Mr. Bell—You have not got provision for receiving by water ?

Mr. Hall—Yes sir ; one large store on this side of the canal.

Mr. Bell—What is the capacity of the stores of your Company ?

Mr. Hall—1,300,000 bushels ; in winter time, when the shipping is at Portland, then we bag and rail to Portland for the old country, but, during navigation, barges are used. A barge comes down to the elevator, and takes enough bagged to stiffen the vessel, but the rest goes in bulk.

Mr. Fleming—What connection would you have with these docks ?

Mr. Hall—You would have to come here, unless you put a bridge across the basin they are building now.

Mr. Fleming—According to your view, it seems a matter of little moment where the warehouse is.

Mr. Hall—I think it makes little difference, whether it is on the harbour or canal.

Mr. Fleming—Would they store grain through the winter ?

Mr. Hall—Well, sir ; we can store it up there, and then can lighter it down to the ships. I have been in business 16 years ; we can take it down for one cent and an eighth.

Mr. Bell—What are your views as to carrying on the grain trade, if it becomes larger, by the propellers from the lake ?

Mr. Hall—I think I should break bulk at Kingston.

Mr. Fleming—What is the advantage ?

Mr. Hall—I think it is cheaper, and that is the central station.

Mr. Bell—Have you any statistics ?

Mr. Hall—Last year we took in by the 1st of September 173,000 bushels ; this year we have taken 42,000 bushels in the same time.

Mr. Bell—And during that time you have shipped in the aggregate ?

Mr. Hall—The same as last year, 600,000 bushels.

Mr. Bell—What per cent. was put into store?

Mr. Hall—Under five per cent.

Mr. Bell—You say your capacity is 1,300,000 bushels.

Mr. Hall—Yes, sir.

Mr. Bell—What is your stock on hand?

Mr. Hall—It varies; to-day it is 120,000 bushels.

Mr. Fleming—What per cent. moved came down by water, and what by rail?

Mr. Hall—The returns of the Board of Trade will show that.

Mr. Bell—How many bushels passed through your storehouse in the course of a year?

Mr. Hall—As much as 30 per cent. passed through in store; that is, when I speak about store, Mr. Gould has got a storehouse, and Mr. McDougall also.

General Newton—That is taking the storehouses altogether?

Mr. Hall—Yes sir; that is, 30 per cent. was generally stored altogether before being shipped; this year, however, there is not five per cent.

Mr. Bell—It is admitted there is scarcely sufficient storage capacity.

Mr. Hall—There is plenty of storage capacity.

Mr. Bell—You have got 1,300,000 bushels capacity; what have the others?

Mr. Hall—Mr. Gould has 300,000 bushels, and Mr. MacDougall 250,000. I think that is plenty, from my experience.

Mr. Fleming—Do you think it will be plenty ten years hence.

Mr. Hall—That is a pretty long time. I should hope it will not be, for the sake of the city, but to-day there is ample room. On the 1st October, there were 180,000 bushels of wheat in store in Montreal.

Mr. Fleming—Do you think 50 per cent. additional storage capacity would do in ten years?

Mr. Hall—Yes sir; because it is not to their interest to store in the summer season.

General Newton—You said you had been in every kind of business; cannot you give us some idea of the milling business, as to what the present prospects are, whether for increase or decline, and the reasons?

Mr. Hall—I think it has been declining these six or seven years. I don't think we can compete with England in grinding.

General Newton—You have got a large trade in flour in the Provinces?

Mr. Hall—Yes sir, and we have got all Upper Canada to supply them.

General Newton—Do you attach much importance to additional water power in Montreal?

Mr. Hall—Yes, if you had a proper supply; to-day there is not sufficient water in the Lachine Canal to keep the mills going.

Mr. Bell—If the supply was ample, would they be working?

Mr. Hall—I think they would.

Mr. Bell—Double as much ?

Mr. Hall—Yes, sir ; over that. There is one objection we labour under in winter We have got 18 feet lead in Mill Street ; but when we get this high water and jam of ice, we lose that. The power is very variable, and I have seen when it would be more profitable to have shut off altogether. The grist mills have not been running steadily. My view is that everybody ships to England, and when he gets it there he has to sell it. We grind too much in this country ; I am satisfied of that, and also that it pays the country better to ship the wheat.

Mr. Bell—Speaking generally, what would this additional power be applied to ?

Mr. Hall—I think small factories would start up.

Mr. DAVID E. MACLEAN, Montreal Transportation Co., representing
the Grain Trade.

I cannot give you much more information than Mr. Hall has done. If there was an elevator built to hold three-quarters of a million bushels of grain in a position where it would be clear of ice shoves, and where sea-going vessels could go alongside and load, it would facilitate the trade very much.

Mr. Bell—You have seen the elevators in Toronto, do you mean something of that sort ?

Mr. Maclean—Yes, but of course it would require to be placed on a high level to escape spring floods and ice shoves, and where a double rail track could run through the centre.

Mr. Fleming—You think vessels would come alongside ?

Mr. Maclean—Vessels that were not too tender would ; in winter such an elevator would fill up with grain from the railroads.

Mr. Fleming—Do you think that should be done by the Harbour Commissioners—I mean the construction of elevators ?

Mr. Maclean—I think it would pay, whether done by the Harbour Commissioners or by private enterprise.

Mr. Fleming—You think, if they erect a wharf at a good place, private enterprise would take it up ?

Mr. Maclean—I think so.

Mr. Fleming—How many elevators ?

Mr. Maclean—One large one, to hold three-quarters of a million bushels of grain, built as oblong as possible, and having water on three sides.

Mr. Bell—From what you know of ice, do you consider if a breakwater was erected out here, that you would be protected ?

Mr. Maclean—I think so, if built as high as present revetment walls, the ice would shove on the top, or over it, and drop down inside without doing harm. If such a breakwater was built, it ought to be wide enough on top to admit of, at least, two lines of railway tracks, besides sufficient room to land coal, or other cargo, during open season. The great drawback to the trade of Canada has been the smallness of the locks on the Welland Canal, and, until they are enlarged, the seaward volume of grain, shipped *via* the St. Lawrence, will keep at from about eight to ten millions of bushels. Canada ought to be able to assist Buffalo and other points, where, at certain times, they get crowded, and have far more to handle than they have facilities for; when the largest sized vessels and propellers, now trading on the upper lakes, can come through the Welland Canal, the trade will be relieved at once, and exports sea-ward, by the St. Lawrence, will run up to at least twenty to twenty-five millions of bushels.

Mr. Bell—They propose deepening it to a capacity for accommodating vessels of 1,000 tons.

Mr. Maclean—They propose deepening it to 14 feet,—it is 10½ feet now; they first proposed deepening it to 12 feet, but I believe they are now going to make it 14 feet on lock sills; I think the locks ought to be 16 on lock sills, as Western harbours are every year being deepened, and larger sized vessels being built; even the small matter of six inches will often divert a large proportion of the trade.

Mr. Bell—Would you deepen the St. Lawrence Canal to the same depth as the Welland?

Mr. Maclean—No, I do not see any immediate necessity for doing so. I consider the barge system below Kingston as best adapted for the trade.

Mr. Fleming—Do you think it best to tranship grain at Quebec?

Mr. Maclean—Yes, it has always been my idea that it has been money thrown away bringing large sea-going vessels up to Montreal. The towage, time wasted and other expenses, have been too great to remunerate vessel owners. If there had been one-third the enterprise in Quebec that there has been in Montreal, Quebec would have taken the trade, and kept it. I have always thought that the proper place for docks for the trade of the *Dominion* is at the mouth of the River St. Charles.

Mr. Bell—If that is the case, how is it that trade does not go there?

Mr. Maclean—Because Quebec has made no effort either to get it or retain it. It has been simply want of enterprise.

Mr. Bell—That is a very generous view for a Montreal man to take.

Mr. Fleming—Then you think Quebec ought to be the port; how do you reconcile this with your previous testimony?

Mr. Maclean—You first ask me questions relating to the future prosperity of *Montreal alone*. These I answered; and now you ask me what will be beneficial for the *whole Dominion of Canada*. I consider it is a mistake to follow the river up from the ocean any higher than where river craft can do the work.

Mr. Bell—Why not go further down?

Mr. Maclean—Because I think Quebec far enough down, and the mouth of the River St. Charles naturally adapted for building docks. Barges can go with all safety from Kingston to Quebec in tow, and at as low a freight as from Kingston to Montreal, if they know that they can get any return cargo, which they would do if sea-going vessels discharged at Quebec.

Mr. Bell—You think it would make no difference between Chicago and Quebec and Chicago and Montreal?

Mr. Maclean—Not one cent a bushel. The grain trade of the St. Lawrence for the past number of years has been partially worked by monopolies, and it seems to have been the policy of steamship lines to keep the volume of trade under ten millions of bushels, their idea being that if it increases rapidly they would be unable to keep pace with it; opposition would set in, and they would lose the monopolising control.

Mr. Bell—What brings these large steamers up here: grain trade or general cargoes?

Mr. Maclean—Both.

Mr. Bell—I suppose you have been talking, hitherto, with reference to the grain trade only?

Mr. Maclean—No, not altogether.

Mr. Bell—Do you mean you would rather break bulk of a large ship at Quebec, and tranship the cargo, with all the risk and nuisance of breakage, than bring it to Montreal?

Mr. Maclean—Montreal only receives a proportion of inward goods: a large proportion go West, and it would make little or no difference on goods destined West, whether they were transhipped at either the one place or the other, and if Quebec was the transshipping point, there would always be plenty river craft there to receive cargoes for the West, as also the railroads.

General Newton—If that had been done, Montreal would be a small place.

Mr. Maclean—Probably, but as it now is, Montreal, from her enterprise, has become a large city, large sums have been spent to bring the trade to her; she has acquired a firm grip on the trade, and if another bridge is built across the river, or the Victoria Bridge thrown open to every railway, three or four American Railways would come in almost immediately; this would be another inducement to continue Montreal as a great trade centre. One of the principal

things to be kept in mind is the expenses of the port, and the enormous towage rates to and from Quebec. These expenses have had the effect, heretofore, of deterring vessel owners, to a certain extent, from sending their ships to Montreal.

Mr. Bell—You mean the works should not be too expensive for the requirements of the trade? Is it your opinion you want more accommodation?

Mr. Maclean—Yes, much more than is at present available. The harbour has been, at times, far too crowded. If Montreal is in the future to do a large proportion of the grain trade of the West, the accommodation is far too small.

Mr. Bell—How much more accommodation do you want?

Mr. Maclean—If the Welland Canal is deepened to 16 feet on the lock sills, there will not be one-third accommodation enough. That is, two-thirds more accommodation will be required over what is at present available, not including works now going on and not completed.

Mr. Bell—Then with 14 feet of water do you want double the quays?

Mr. Maclean—Double the amount of trade can be done with less than double the amount of quays. The trade may be increased many times without increasing the quay room the same number of times; of course there is a ratio.

Mr. Fleming—If the accommodation doubled in ten years, do you think it would meet the requirements?

Mr. Maclean—No, not sufficiently; in addition to former business, a large lower port trade has sprung up, and a steamer engaged in this trade takes up as much space as a large ocean-going steamer.

Mr. Bell—Well, will not many vessels go up to the canal basins when they are finished?

Mr. Maclean—Yes, undoubtedly; but in speaking of the present accommodation, I do not include any works now going on, and not completed; I have been speaking of the harbour and canal as they now are this year.

Mr. Maclean—Allow me to add another suggestion, which I think would be very beneficial to the trade of the Dominion. I am credibly informed by engineers, a double track could be placed over the Victoria Bridge at a comparatively small expense, supported on the present angular extension of piers. Were the Dominion Government to purchase this bridge from the Grand Trunk Railway Company, they would reap a paying interest by charging a certain toll for every car passing over, no matter to which R. R. Co. it belonged—the Government buying the bridge with the understanding that the G. T. R. Co., with the money so acquired, would lay a double track on their line from Detroit to Portland and Quebec, the money to be paid as the work progressed. The

Baltimore and Ohio Road cost \$33,000 per mile, and I have heard many persons of high railway standing affirm that an additional track could now be laid on the entire Grand Trunk Road for from \$12,000 per mile; I should also say it would be a great boon to the Grand Trunk Railroad, as every American Railway coming into Montreal would act as a feeder and receiver to and from it; were this done, even still more harbour accommodation would be requisite.

SIXTH DAY'S PROCEEDINGS.

The Board again assembled on October 20, at Ten o'clock, and resumed the hearing of evidence by

Mr. DESCHAMPS, representing the Rafting Trade.

General Newton—We were told yesterday that you were one of the best parties to give us information about the rafting of timber or lumber down the St. Lawrence.

Mr. Deschamps—At what place?

General Newton—From Lachine to Montreal, or any other place about which you have information. Does much lumber come down from Lachine to Montreal?

Mr. Deschamps—Yes, sir; a good deal.

General Newton—And what is it principally?

Mr. Deschamps—Principally square timber, sawn timber and cedar, three inch and two inch. It comes from Ottawa. There is a good deal of timber coming down.

General Newton—Where is it going to?

Mr. Deschamps—All round the mills, to go along the wharf to the Hochelaga dock, and some goes a little further down. A good deal is landed in the canal, to supply the trade here, a little below Cote St. Paul, and below the St. Gabriel Locks.

General Newton—Will you describe how the most of it comes down from Lachine to Montreal. Does it come down the river or canal?

Mr. Deschamps—All St. Lawrence lumber runs down the rapids, except the Montreal supply, which comes through the canal.

General Newton—Do the rafts that are passing Montreal go down the canal or river?

Mr. Deschamps—Those that go through the St. Lawrence, for Quebec, go over the St. Lawrence. All those that come in on the St. Lawrence side would rather go through the canal. It suits them better to go through the canal. There is not so much danger as going through the rapids. There is too much danger there.

General Newton—They prefer to go through the canal. Do any of the rafts go down at the back of Montreal?

Mr. Deschamps—Oh, yes, a good many; all the timber going to Quebec goes on the north side; but there are a good many parties stop at the Lachine market; they can

slip off at Three Rivers or Sorel; they stop at Lachine for the market, and if they don't sell they go through the canal.

General Newton—If they get orders to go direct to Quebec, but call at Lachine for orders?

Mr. Deschamps—If they get orders before starting to go to Quebec by the St. Lawrence, they take the Caughnawaga side; they will go straight down there.

General Newton—What per centage of timber; will one half go on the canal, and the other half down the river?

Mr. Deschamps—I think there is more timber passes through the canal; some years I know there is more goes that way.

General Newton—More than down the river?

Mr. Deschamps—Yes; we used to leave it at Isle Dorval; this year we have to pay a royalty to the farmers or they will not allow it; when they get down here they expect to sell the raft, so they get a privilege from the farmer.

General Newton—What are you going to do with it now?

Mr. Deschamps—The most of the timber stops at St. Ann's; I was up there yesterday.

General Newton—Have you space there for it?

Mr. Deschamps—No sir, I saw some timber that is put away there for the winter; I am sure there is danger. I recollect a few years ago storing some timber there for Mr. Stephen Tucker, but the ice broke it away—broke the chains, and the timber drifted for miles.

General Newton—Do you know any place in Montreal at which it could be stored?

Mr. Deschamps—There is one point I looked at, Big Bay, a little below St. Claire, above Lachine and above Ile Dorval. That is the best place I saw, because there is no current there; it is dead water, not the same as beyond the island where the water comes in high, and as soon as it falls the timber is left dry. If we put it further away we are in the heavy current, and if we put it close in to the shore when other timber comes in it presses too heavily; I saw some timber wait here for two months before we could get it back into the river, it was so shallow.

General Newton—Is there any place near Montreal? Do you know Nuns' Island, —how would that do?

Mr. Deschamps—I can't see that it would do well, because close to Nuns' Island there are a good many shallow places. They will go through the canal.

Mr. Bell—It has been said it was a suitable place to store timber all the year round?

Mr. Deschamps—Half the timber is not able to pass there. Nuns' Island is on the St. Lawrence side altogether. They could not do anything for the Ottawa timber at all.

Mr. Bell—You cannot guide your rafts to the other side?

Mr. Deschamps—No, sir. They could take a boat and tow it to Lachine, but the

timber on this side, coming to Quebec, never comes to this side; they go through the rapids.

General Newton—The timber that is coming to Montreal, would it be a good place to stop at Nuns' Island?

Mr. Deschamps—It would not be a good place at all; they have not space. They might make a depot there for timber. If you make a depot there, it is only good for the St. Lawrence timber.

Mr. Bell—Would it not be better to store it there, and lock it up the canal, than store it at Lachine, and lock it down through the canal?

Mr. Deschamps—It is better at Lachine, because it would be impossible to lock the rafts up the canal, and to tow it against the stream is very difficult.

Mr. Bell—Assuming that it was a good place, I mean to say, and that there was no difficulty in towing up the canal, would there be any difficulty in keeping it in winter?

Mr. Deschamps—There is a deal of difficulty; it runs very high, and then it is shallow too; for half the time, if they did not take it out, it would be high and dry.

Mr. Bell—Suppose you put timber here.

Mr. Deschamps—You cannot get near to Nuns' Island at all, unless it is very high water. There is no time to go there with timber at any season of the year, except at high water. Ask any pilot if he has got a channel to go to Nuns' Island; he will tell you, some times there is no more than one foot of water.

Q. Would the ice endanger it much?

A. Yes, sir; every year there is a lot of ice there.

General Newton—According to your opinion, there is no place to stow your timber, except above Ile Dorval, in the Big Bay?

Mr. Deschamps—That is the best place I have seen for timber. There is dead-water there.

Q. Does the water rise?

A. Yes, but there is dead water.

Q. There are no ice-shoves?

A. No, sir.

Q. And your timber can lie there all the year round?

A. Yes, sir.

Q. You say it is the best place; why?

A. I consider it the best place on account of its space and dead water, and especially when boomed.

Q. You want the Government to assist you?

A. Well, that is what the petition is for; I think they sent to ask the government to make it available, and charge so much for a thousand feet; Hochelaga will be out of the question, except for protection for lumber going to Quebec, that is not the local

trade; the place for the local lumber trade is now on the canal from Cote St. Paul to Wellington Bridge; that Big Bay is nearer to the trade. If you put booms on the Big Bay, rafts will come close by it, and can shear in; there is a strong current at Ile Dorval, and it is very shallow.

Q. There is no suggestion you can make for accommodation in the harbour?

Mr. Deschamps—There is no place near the harbour that is not too far down.

Mr. SHEARER, representing the Lumber Trade.

Q. It has been suggested that there is a place for a depot beyond Nuns' Island?

Mr. Shearer—I think it is too far down the river to make it available for the city. When the rafts of lumber and timber get down the current, you would pull them all to pieces to get them up to the canal again.

Q. Suppose you had a short canal, connecting between this and the Lackline Canal, above St. Gabriel Locks?

Mr. Shearer—That would answer all these places here above; around and above Nuns' Island is very shallow, and a depot there would be exposed at the upper end.

Q. Is there any other place you think more suitable?

Mr. Shearer—There is no other place near; here (at Ile Dorval) naturally is a protected place for rafts. There is not water enough here (Nuns' Island), you can nearly walk over at some places now. It is a rock bottom; it would suit most admirably if you made a dam and raised the water, and make a shallow canal along the shore upward.

Q. Is there any other place besides Ile Dorval?

Mr. Shearer—I don't know of any; I consider Nuns' Island too far down the stream to make it available for the city West, and it is hard to get at it with rafts, particularly inside of it, unless a channel is made along shore. The current runs on the outside of it, so that I don't know whether you could take timber in without a steamer; timber has to run along the current; you cannot take it out of the current but little.

Q. You can never go up against the current?

Mr. Shearer—No, sir.

Q. Then you don't agree with Mr. Deschamps with reference to Big Bay?

Mr. Shearer—There is plenty of room, but it is too much exposed to the south east wind across the lake, which causes a surf that would break up the timber, unless you had a breakwater, and even then there would be difficulty in getting timber out; you would have to tow it by steamer. Mr. Sippell made a plan for Ile Dorval, to contain two million feet of timber by putting out piers. It was thought that to buy out

the island would be a very profitable enterprise. We wrote to Sir George Simpson's heir, asking him to get permission of Parliament to sell the island, but we ascertained that he has only life interest. If he got permission to sell it, it was proposed to go into the enterprise as a Joint Stock Company. The Premier advised us to do this. If we got up a Joint Stock Company it would be a very profitable business, I think. It was supposed that it would cost \$62,000, and by putting in booms and piers provide every facility required. There were to be two or three rows of piers to run along here [place indicated] by these three small islands. Mr. Sippell calculated this would accommodate two million feet of timber, and cost \$62,000, but I know it could be done for less than that. We made some enquiry about this island, and have written to young Simpson, through Mr. Simpson, to know if he would be a party to it, but I have not heard what has been done since. At Isle Dorval there is a good place.

Mr. Bell—That is under negotiation at present, and there is nothing you can see down near the harbour.

Mr. Shearer—No, sir; I see nothing. We get too far down the stream; it is not suitable for navigation between Ile Dorval and the shore. The wood barges go down there in high water sometimes?

Mr. Bell—Is there anything about the harbour you can suggest with reference to the accommodation for lumber?

Mr. Shearer—Of course; we want a great deal of room which we have not got at present. Anything that is done for the accommodation of sawn lumber, will be best situated at Hochelaga.

Mr. Fleming—If I understand your views, you are of opinion that the space between Nuns' Island and the shore is not suitable for a lumber depot?

Mr. Shearer—No sir; not unless they make dams to raise the water. You could not arrest the timber, and run it in there from the St. Lawrence, unless a canal is made along the shore, on the north side, from above Knox Mill.

Mr. Bell—In other respects is it bad?

Mr. Shearer—Yes sir, and exposed to the south winds there.

Mr. Bell—Then, if you had dams?

Mr. Shearer—I don't think it would be different; it could be made suitable if these works were put above, according to Mr. Legge's plans; it would shelter it more from ice.

Mr. Fleming—You are of opinion that Ile Dorval would be the best place?

Mr. Shearer—For the Ottawa timber.

Mr. Bell—Why not the St. Lawrence timber?

Mr. Shearer—You could not take it to Ile Dorval, being too far north.

Mr. Bell—Is there much coming down?

Mr. Shearer—Not for the Montreal market; it is for Quebec (St. Lawrence) timber.

General Newton—I thought Mr. Donovan told us that some of the Ottawa timber for Quebec came through the canal.

Mr. Shearer—That is owing to their finding no market at Lachine. The whole season's timber for Montreal market must pass St. Ann's in the Spring, while water is high. The Ottawa timber goes down the back river.

Mr. Bell—You want a depot that will be good for the whole trade?

Mr. Shearer—Yes sir; the Lachine canal authorities do not permit timber going through it except on sufferance; they might at any day prevent us from going down the Lachine canal altogether.

Mr. Bell—What then?

Mr. Shearer—We would have to remove our saw mills up to Lachine, and bring it in barges. I think this timber business in the canal will soon be stopped altogether; these rafts interfere with navigation; sometimes they will lie five or six hours in the stream before getting down; they will not permit a raft in if there is a boat approaching anywhere in sight; I think Nuns' Island would be a good place for cutting it up.

Mr. Bell—What about winter storing?

Mr. Shearer—Make provision by putting up break-waters.

Mr. Bell—Does not the shove take place there?

Mr. Shearer—Yes; the ice generally forms a break-water here at the head of the island.

Mr. C. LEGGE, Civil Engineer.

There is a large area at La Prairie Bay, above the Bridge, which is still water. In the Spring, when the ice commences to move, it grounds on the Boucherville Islands, and backs and packs until it gets up to St. Helen's Island. During the time that is forming, it elevates the water probably ten or twelve feet; it is partially dammed up, and all the time the ice is coming. Sometimes the water rises in Montreal harbour twenty-five feet, until sufficient hydraulic pressure is brought to bear against the ice-dam by the ice coming down. If this ice which comes down could be kept back until it becomes honeycombed and rotten, and give time for the ice to get away in the Montreal harbour and at Boucherville, the floods would be considerably modified. Victoria Bridge piers cut the ice, and afford some protection; but the moment it strikes it passes through.

Mr. Legge pointed out where he would have some sort of piers in La Prairie Bay and Lake St. Louis, in the river above the Bridge, to stop the ice, and continued; I think that would be the only way to effectually stop the flood at the St. Lambert's ferry; the water rises and the ice forms and passes over; when the dam here (place indicated) breaks and the declivity takes place, the ice comes down and the water is ten or twelve feet above

these wharfs ; it just glances over the wharf and passes over this island ; there is a difference of two feet in the height of water on each side of the wharf at St. Lamberts.

Mr. Legge's examination was continued :—I was one of the Engineers of the Victoria Bridge ; all the piers are on a solid rock foundation ; pier No. 7 is on solid rock on bed of river.

Q. Do you remember how far down it was in the water ?

Mr. Legge—Just on the surface of the bottom, with a small amount of *debris* ; probably there might have been twelve feet of water ; the boring of the Harbour Commissioners' Engineer will give you the depth of the rock all along ; the dams commence to form down at Boucherville.

Q. Toward what period is that ?

Mr. Legge—Spring and Fall, both.

Q. Spring shoves are the worst ?

Mr. Legge—Yes ; but the Fall is also bad when the lake ice comes down ; then the water rises until the pressure behind becomes so great that it breaks away. The Victoria Bridge piers have modified the thing by breaking up the ice and making the cakes smaller. My strong impression is, to hold the ice back in Lapraire Bay and Lake St. Louis would be attended with good results ; it might be well to try the experiment, because there is very little current there.

Mr. Bell—You propose to stop it in the area below the rapids ?

Mr. Legge—Yes ; and in Lake St. Louis.

Mr. Bell—Would not the ice break away your cribs ?

Mr. Legge—Oh, no.

SEVENTH DAY'S PROCEEDINGS.

The Board again met on the 21st October, when the hearing of evidence was resumed by the examination of

ALDERMAN MCGAUVRAN, M.P.P., representing the Lumber Trade.

That is my place at St. Gabriel Locks, and these are the wharves. [Places indicated on the map.] Well, I think there is no place for timber down there.

Mr. Bell—The canal people are making two large basins there. Now, I would like to know from you how trade is accommodated at present, and what additional accommodation you would get from the canal, and where you think that the lumber trade should be accommodated in other parts of the city?

Ald. McGauvran—Well, I suppose the lumber trade in the harbour is about as well as it can be now, down at the lower end. You cannot interfere with the harbour here with rafts, nor at any place along here, to let them stay any length of time.

Mr. Bell—In the canal you cannot have them?

Ald. McGauvran—No sir. These basins are too valuable; at least the trade could not afford it.

Mr. Bell—There was another proposition for accommodating the rafts; that was, to take this water at the back of Nuns' Island, and dam it across, and make this place for rafts, but the objection has been made that it is too shallow?

Ald. McGauvran—Yes.

Mr. Bell—And that the ice in the winter would make it an unfit place?

Ald. McGauvran—You could not keep it here at all; you see you would have to come over the rapids to go there, and then the water is shallow; the water flows very low in the summer season. If there was anything left there in winter it would be taken away with the ice in spring. My opinion is, that the best place to keep it is above Lachine.

Mr. Bell—Rafts for Montreal or going to Quebec?

Alderman McGauvran—Rafts that are going to Quebec will not stop here anyway.

Mr. Bell—Do the rafts for Montreal?

Alderman McGauvran—I mean the rafts for the trade of Montreal. Nuns' Island would be no place to keep rafts going to Quebec.

Mr. Bell—There is a proposition to keep them at Ile Diable. There has been something done as to that, has there not?

Alderman McGauvran—Yes sir, I dare say there has; there is Governor Simpson's Island. There is only one drawback to that; that is, the water flows so low in summer that timber would get aground. But nevertheless that would be a cheap place to construct booms. Then there is another bay above the Big Bay where the water is deep, but then that is exposed to the wind. At the North East end of Isle Perrot would be a good place for the Ottawa timber; you want to get out of the lake. It will require extensive alteration. If you were going to make booms at Point St. Clair that would be a good place, but it is exposed. You could not get booms there to protect the timber from the force, and from breaking up, because there is a swell on that lake which is something enormous, you must get up into the Straits of St. Anne's. Simpson's Island is the best place I think altogether.

Mr. Bell—It is quite evident from what you say, that you think there is no means of accommodating the rafts down near the town?

Alderman McGauvran—Oh, no, sir.

Mr. Bell—It has been stated that coal and lumber must be taken out in this part of the harbour altogether?

Alderman McGauvran—Well, I must confess, I am of the same opinion myself—that the coal and lumber ought to be taken out here.

Mr. Bell—It is proposed that the coal should be taken up to the basins and then to the Grand Trunk Railway; also, that there should be some basins formed for it at Point St. Charles?

Alderman McGauvran—I think so.

Mr. Bell—And that for the lumber, it will be better to take it down to Hochelaga?

Alderman McGauvran—Oh, that would be out of the way altogether. The grand store ought to be above; there is no disadvantage, and I am sure it may be apparent to any gentleman who knows anything about the trade of the city, that to put lumber down along the harbour, or any place along the other side of Montreal Island, or say, go to the other side of the river, it cannot stay there more than six months. It has to be cleared away, or else the ice will clear it. Now, take Lachine Canal store with three million feet. This boom is full; if that had to be cleared away before the close of navigation, how would it be done? If you bring it down here the ice will take it away. We know the result of the rising of water; you have to store it above in some good place. I have not given the subject such consideration as it deserves, to determine which of these two places is the best. I would not advise trying to make a harbour for lumber, so as it will be exposed in Lake St. Claire. It would cost too much to get up near St. Ann's, or down by Governor Simpson's Island.

MR. McQUISTEN, City Surveyor.

I can give you the levels with regard to the height of water at different floods; if that is of any service to you. I have levels of the big flood in 1861, when we had water one or two feet over the revetment wall. The flood level that year was 22.80 above datum, and the datum is 19 feet on the sill at the entrance-gate of the canal. It was 22.80 above that.

Mr. Bell—Then that would cover the lower basin?

Mr. MacQuisten—The coping of Lock No. 4 is 25.54 above datum. The flood came up McGill street to about Lemoine street. I sailed in a boat through St. Ann's Ward in about two or three feet of water during that flood.

Mr. Bell—Did the ice jam that year?

Mr. MacQuisten—I will give you one of my annual reports of that year, where I have the heights of flood taken at various points, as far down as Longueuil Point; the plan attached to it shows where the ice jam was that year.

Mr. Bell—How does the ice shove, —I suppose you have seen it?

Mr. MacQuisten—I have never seen it shove twice the same way.

Mr. Bell—Have you seen it shove in this part [close to the bridge indicated]?

Mr. MacQuisten—Yes; I have seen it shove on the south side of both abutments.

Mr. Bell—Since the bridge was built?

Mr. MacQuisten—Yes, since the bridge was built. I have seen it opposite St. Helen's Island, also across Commissioner street to the second storey windows of the houses. I have seen the river opposite the city clear of ice, while the ice was held at Longueuil ferry, and then have seen it fill up again, with the ice from Lake St. Louis. This ice gets down below the ice at Longueuil, forms a dam, causing the water to rise.

Mr. Bell—Do you think the pier at Moffat's Landing is any objection?

Mr. MacQuisten—It tends to throw water on this side.

Mr. Bell—Has it any effect on the ice-shove?

Mr. MacQuisten—I don't recollect seeing a shove at Moffat's Island since the Bridge was built; we have not seen such large piles of ice since the bridge was built as before its construction.

Mr. Bell—How do you account for it?

Mr. MacQuisten—The bridge breaks it up.

Mr. Bell—Then, formerly, did it come down in great sheets?

Mr. MacQuisten—Yes; the ice came out of Laprairie bay; the tendency is to shove this way at Molson's wharf, and near the Longueuil Ferry wharf; there used to be very heavy shoves; from the Long wharf to Victoria wharf I have seen it pile up considerably; except when the dam is of ice above Ruisseau Migeon, the difference in level of surface of water in summer from Jacques Cartier wharf down to Ruisseau Migeon is pretty much the same all the year round.

Mr. LESAGE, Superintendent Water Works.

On this part of the River St. Lawrence, from the entrance to the Water Works down to the tail race of the Water Works, I have the levels for the winter months since 1856.

Mr. Bell—Have you them in any record?

Mr. Lesage—Yes, sir; in books that could easily be obtained and compiled in any shape or manner which you require them; for five or six years points have been gauged at three or four places, to observe the winter compartments of the river; I had to observe that closely, as well as the formation of anchor ice (frozee); these levels could be got, also the daily levels for winter months.

Mr. Bell—Have you any tabulated statement at all?

Mr. Lesage—I have my annual reports, in which they are tabulated.

Mr. Bell—Our best way is to get the annual reports, and then refer to you for anything that we want?

Mr. Lesage—Yes, sir; I shall be happy to give you all the information in my power.

Mr. Bell—You have the gauges at fixed points?

Mr. Lesage—These levels are all based upon one datum, the low water in the harbour taken at 19 feet above the sill of the lower lock of the Lachine Canal. The points gauged in 1870, 1871 and 1872 were at the Lachine old Church, at Frazer hill, at the entrance of the present Aqueduct, at Knox Mill, at Crawford's farm, and at the mouth of the Tail Race of the Water Works. In 1866 there was a great deal of talk about placing the Water Works at the rapids, by damming up the river at that point (Isle Heron). A company offered no end of inducements. I had to study the compartment of the river, and was always afraid that the winter would be unfavorable for the Water Works, on account of the backing up of the water at that point. It was finally decided to pass inland, as that was the best way to utilise the water power. Gauges have been taken at Knox's Mills, another at Crawford's farm, another at the Tail Race, on the St. Lawrence, on the Lachine Canal, and at the Works, also on corresponding points on the other side of the river at the Indian Reserve, at the junction of the Caughnawaga with the Parish of Laprairie, and at the foot of the Rapids. One was also taken at Laprairie Village, at the wharf. I noticed, particularly latterly, that the river below the rapids is, on the north-west side getting shallower, and the water is running eastward to the main channel. This year, I noticed a great stream running down this way. The natural formation of the rocks indicate that the fall is in that way. In winter, the water rises at that point, opposite the Nuns' Island, ten and fifteen, and sometimes twenty feet. In January, when the ice has formed in front of the city, it reaches all over these basins, and during January the work of this ice coming down

here has the effect of backing the water to such a level that I have seen the rapids obliterated, and the ice formed right across as far as the Ile Diable. A few years ago, about the 25th of January, after two or three days of very cold weather, during which the ice had formed very rapidly, and had reached up to Ile Diable, it got so much undermined by the current that it gave way all at once, and came on the shoals at the head of Nuns' Island, and had the effect of raising the water in the basin below the rapids to twenty feet. On the occasion I speak of, the Lower Lachine Road was flooded from opposite Ile au Heron to River St. Pierre, and the ice shoved in the fields adjacent to the banks of the Aqueduct, and the inhabitants were in great danger. The road that winter was entirely covered with ice, and had to be cut between the banks of ice; our aqueduct was also overflowed on that occasion. All these are from local causes.

Mr. Bell—Do you think this pier (St. Lambert) has any effect on the river here?

Mr. Lesage—There must be something very bad, because, you see, in each of these sluices the rapidity with which the water goes through is great. It must keep the water back two feet at least.

EIGHTH DAY'S PROCEEDINGS.

The Board again met on October 28, at Ten o'clock, when the hearing of evidence was resumed by the examination of

Mr. ROBERT ESDAILE, Produce Merchant.

General Newton—We have learned with regard to the wheat and grain trade that the greater portion of it comes by the canal; that only a small proportion comes by rail?

Mr. Esdaile—Yes, that is correct.

General Newton—We have also learned that the storage required for it is comparatively little; that they have capacity for storing two million bushels?

Mr. Esdaile—Yes.

General Newton—And that the grain barges or lake vessels break bulk at Kingston, and the grain is brought down in barges, and at once transhipped into sea-going vessels?

Mr. Esdaile—That is correct so far. There are special reasons when a large amount of grain has to go into warehouses.

General Newton—Now, I wish you would state something in regard to warehousing. That has been a point of conflicting evidence. Some of the gentlemen who have been before the Committee have expressed an opinion that it is of very little importance, and others have suggested that it might be very important. I wish you would speak upon that.

Mr. Esdaile—Well, the fact is—there is great repugnance on the part of importers to put grain into warehouse, if they can avoid it. The practice here is different from what it is at Chicago and Milwaukee, because there everything goes into store. Here, it is not so. A barge comes down here, laden with grain; and, if there is a sea-going vessel ready within a few days, or even a week, it is held over. The importers will not put it into warehouse if they can avoid it. At the same time, there are times when it has to be warehoused. There is no doubt but that a considerable amount of warehouse capacity is required. At the same time, I believe the capacity which already exists is about sufficient for the trade. But there is another point on the subject of warehousing—that is, with reference to the winter trade. Last year there was a large amount of grain brought down during the winter, which was warehoused.

What I would specially like to refer to, as far as regards the grain trade, is, in my opinion, the great advantage it would be if we had an enlarged harbour, and docks located so as to be near the canal, the railway, and the bridge. You have the terminus of the railway and the canal close there; and, in my opinion, it is a matter of importance to the trade that we should have vessels stop as near there as possible. I have been for a great many years in favour of the project which has been called "Young's Docks," situated near the bridge. I have advocated that scheme, and, in my opinion, it is a scheme which would give great facilities to the trade I represent. The trade of the port must assimilate with the trade of the west, or the opinion expressed by others in the trade, that we have enough accommodation, is correct. I think it would greatly facilitate trade if forwarders and shippers would allow everything to go into store, as it is in the west; but, hitherto, that has not been practised. At special seasons, such as this, when there is not a pressure of stuff, the forwarders are very lenient, and allow their barges to remain here a long time; which, under a great pressure of trade, they would not be able or willing to do.

General Newton—You state that the quantity by railway increased last winter?

Mr. Esdaille—Yes, sir.

General Newton—Where does the Grand Trunk draw from?

Mr. Esdaille—The stuff was principally Canadian. There is little or nothing comes down from the west by rail in winter. In summer, the G. T. R. brought stuff down from Chicago and Milwaukee, in competition with the river, at very low rates of freight.

General Newton—Then you think that the Grand Trunk Railway, in winter, cannot compete with the railways of the United States in carrying grain to markets, unless they confine themselves to Canada?

Mr. Esdaille—I think the distance is too great to bring the stuff from the west profitably. I know one cause of the low rates of freight on the American railways, is the fact that there is a large tract of country, south of the main lines, connected with the main line by branch railways; that makes the freight low. We had stuff brought here last spring from Chicago, Milwaukee and other places, at 12½ cents a bushel; but I cannot imagine that pays.

General Newton—There is a large tract of country in Canada that will eventually become a grain-producing district?

Mr. Esdaille—Yes, sir. Hitherto the Grand Trunk Railway have charged such high rates of freight, that it has been impossible to bring grain here in winter. They brought it at lower rates last winter, and consequently a larger amount of stuff came; but it is generally shipped from the western districts of Ontario straight to New York and Boston, without coming this way at all during winter.

General Newton—I suppose, when the Grand Trunk brings grain here in winter it is for storing until spring.

Mr. Esdaille—Yes, it is stored and shipped during the spring months.

General Newton—One gentleman told us, in regard to the mode of conducting the trade in grain, was not to consign it, but simply deliver on order. Also told us that he thought this was probably due to the fact of the cable telegraph?

Mr. Esdaile—There is no doubt the cable has made a revolution in the trade. The stuff that is brought here from the West is sold before it comes here. We have not such a thing now as the consignment of goods from Chicago, except occasionally, and then it amounts to nothing. New York is differently situated. They raise the money to buy the grain through their own connections, and it goes direct to New York for sale. We have seldom anything that comes here from the West, except what is sold before it gets here.

General Newton—Is it not a fact that the grain being consigned here, diminishes the necessity for warehouses?

Mr. Esdaile—No, I don't see that exactly, because if it is consigned it may be sold previous to reaching here.

General Newton—I mean that it is not consigned.

Mr. Esdaile—Undoubtedly. We have seldom stuff here seeking a market. It is already sold when it gets here.

General Newton—In regard to these barges, the testimony that we have obtained heretofore is rather doubtful on the point. Some gentlemen are of opinion that it matters very little how long barges are delayed, so long as it is within reasonable limits. Then again, we enquired into the question of demurrage. That question must come in in some shape or other, but we could not get any satisfactory answer on that point.

Mr. Esdaile—Well, sir, this season, owing to the small amount of stuff coming here, I don't think we have had to pay demurrage. We are now loading stuff that has been here three weeks.

General Newton—Probably the larger number of barges are owned by shippers of grain in Montreal.

Mr. Esdaile—No, not any. The barges are owned by forwarders, who, in prosecuting their trade, do not allow barges to remain here long; but this summer they have more capacity for stuff than they have to carry, therefore they have been lenient. I don't know any case where forwarders have charged demurrage this season. In seasons when there is a pressure of stuff, and freights are high, they (forwarders) are not so lenient, and charge demurrage.

General Newton—Then, in the brisk season, and especially in the latter part, if the trade is crowded, they do charge demurrage?

Mr. Esdaile—Yes, sir. Our facilities, hitherto, of getting stuff have not been so great, but this year they have been greater than usual, on account of the depression that exists. The charge this season for bringing grain out of store has been three quarters of a cent a bushel. In former years it was greater. Montreal is peculiarly situated; therefore, we require little storage capacity during winter. Hitherto the

question of freights interfered so much with the trade that it was best to leave it where it was, and bring it forward in spring.

General Newton—I also understand another thing, that the trade of Montreal being confined to seven months, that it all being crowded into that period of time, more space was required than at other ports where the harbours are open all the year for a like amount of trade?

Mr. Esdaile—Undoubtedly.

General Newton—It has also been stated by a gentleman whom we have had before us, that the peculiarity of trade in Montreal required an excess of accommodation, from the fact that it is confined to a short period; that it was not distributed equally?

Mr. Esdaile—I think that idea is correct, especially during the months of October and November. I have seen the harbour excessively crowded, and there is one reason for showing that we require more accommodation. It is the fashion to allow long steamers to lie broadside on the wharves, which in other places is not the case; but here every vessel seems to expect she shall have her whole length alongside the wharf, and the consequence is that I have seen them two or three tier deep. It seems to me some plan might be devised to make vessels take less space than they now do.

General Newton—The difficulty is, you could not get your elevators alongside; you could not have the same despatch?

Mr. Esdaile—At certain seasons of the year despatch is of vast importance, because the delay of vessels increases insurance. Insurance rates rise every week or ten days.

General Newton—You know they are excavating new basins in front of Mill Street, and you know that basin which, by the plans, is being extended as far as the warehouse of the Montreal Warehousing Company, so that grain can be spouted directly into ships?

Mr. Esdaile—Yes.

General Newton—Don't you think a line of stores could be built on the front of the basin, so that grain could be spouted direct into vessels?

Mr. Esdaile—Yes; and, therefore, it is of vast importance that the channel should be deepened opposite Mill Street.

General Newton—That, you think, would give storage capacity for a number of years?

Mr. Esdaile—I think so. I have seen the storage capacity here quite inadequate; but that was generally in the spring of the year, when, owing to the block of ice, vessels have been two or three weeks later in arriving, and the stuff had been brought ready to meet them at an earlier date. That was before we had this large warehouse of the Montreal Warehousing Company.

General Newton—After a vessel had taken in enough grain to balance her, she could drop down to a warehouse to complete her cargo.

Mr. Esdaile—Yes; when she has got part of her grain cargo in, she could move to any part of the harbour.

General Newton—Will you speak about the milling. We have understood that there is considerable trade done in flour here; but a great deal of it comes from other parts of Canada; that it is simply shipped from this place, and we understand, likewise, that the milling interest is not so successful of late years, and that it is not increasing.

Mr. Esdaile—No. I don't, generally speaking, think the milling interest of Canada has been successful.

General Newton—I speak of Montreal?

Mr. Esdaile—I don't think it has been successful here. In the spring months of the year (May, June and July), our millers, as a rule, do not make money, because they are met with the accumulation of winter stock, which has been manufactured in Ontario; but they make money in the fall of the year; but, of course, that depends upon circumstances.

General Newton—Where is the flour manufactured in Montreal consumed?

Mr. Esdaile—A large amount goes to the Lower Provinces, Newfoundland, etc. Some years a large amount goes to Great Britain, but the largest amount goes to the Lower Provinces.

General Newton—Do you suppose there will be a great increase in your milling if the trade of the New England States is opened?

Mr. Esdaile—I have no doubt of it.

General Newton—In other words, reciprocity would increase it?

Mr. Esdaile—Yes, sir. During the time we had reciprocity, we sent a large amount of flour to the Eastern States—Maine and Portland. As a rule, our millers do not make high grades of flour. They confine themselves to lower grades; what we call Spring Extra. The Eastern States require a higher grade of flour. Our millers do not mill much Canada Wheat; they prefer the Western Wheat. The warehouse for produce ought to be on the canal. I think, for bulky goods, it will be convenient to have warehouses on the canal, because they would go there by water, and you would have less cartage, and I also think there is little or no necessity to have warehouses in the centre of the city for general goods.

General Newton—Then the warehouses might as well be at Hochelaga as in the canal, for general goods?

Mr. Esdaile—Well, Hochelaga is too far down. We should be subjected to increased cartage. Nearly all the stuff goes west, so that if it was at Hochelaga it would entail a larger amount of cartage. If it all went by railway it would not be of so much importance.

General Newton—Suppose you sent a barge down there for what you sent west by canal, would that make much difference?

Mr. Esdaile—I think it would make a difference in freight, and would be inconvenient.

General Newton—Then, in regard to the railways coming in there?

Mr. Esdaile—With regard to the railway, parties shipping goods from Hochelaga would find it as cheap to ship goods from the canal. The extra mile would make a difference shipping in barges, but carriage on the railway the extra mile would make little difference.

General Newton—I ask this question, because extending the accommodation in the harbour opposite the city is necessarily limited, and should Montreal become a larger city, as many imagine it will, when that time shall come you will be compelled to extend your limits.

Mr. Esdaile—Oh, that is quite possible. Still, in my opinion of the accommodation that has been spoken of as going on up by the canal, with these docks it would be sufficient for Montreal for the next generation. There is a very large amount of wharf room taken up by wood boats that might be sent elsewhere. I believe they are ordered out of Victoria Basin.

NINTH DAY'S PROCEEDINGS.

The Board again met on 1st November, at Ten o'clock, and resumed the hearing of evidence by

MR. ALEXANDER MAURICE DELISLE, late Collector of
Customs.

I was thirteen years a Harbour Commissioner, (eight of which I acted as Chairman unanimously elected by the Board), first, when the Commission was exclusively nominated by the Crown; and secondly, with four or five other members appointed by popular election. I could not better illustrate my views as to the requirements of the trade of Montreal than by referring to a plan prepared under my direction, or at least under the direction of the Board over which I presided, some three or four years ago. This plan, I may add, before being finally adopted, received the sanction of the Board of Trade, or rather the Council of the Board of Trade, and the Board of Public Works at Ottawa, and on a motion, proposed by Sir Hugh Allan at a meeting called for the purpose of considering the plan, it was unanimously adopted.

Excerpt from Minutes of Proceedings of the Harbour Commissioners:

“MONTREAL, 7th November, 1872.

“Meeting of the Board of Harbour Commissioners.

“PRESENT.

“A. M. DELISLE, Esq., *Chairman*.

“GEORGE STEPHEN, Esq.

“WILLIAM WORKMAN, Esq.

“HUGH McLENNAN, Esq., *Pres. Board of Trade*.

“Letters were received from the Board of Trade and Corn Exchange Association, accepting the invitation of the Commissioners to inspect the plans for harbour extension, to-day, at 2 p.m.

“At two o'clock p.m., the Commissioners met, in accordance with an invitation to that effect. Members of the Board of Trade, Corn Exchange Association, City Cor-

poration, and others—among whom were the Commissioners, Mr. DeLisle, Chairman; Mr. Stephen, Mr. Workman, Mr. Coursol, Mayor; Mr. McLennan, Pres. Board of Trade; and Sir Hugh Allan, the Hon. John Young, M.P., Mr. Ryan, M.P., Mr. Jetté, M.P., Mr. Thomas Rimmer, Mr. T. White, Mr. E. G. Penny, Mr. Morin, Mr. Henshaw, Mr. Patterson, Mr. Butters, Mr. Gould, Mr. Mitchell, Mr. Labelle and Mr. Grant, with representatives from the *Gazette, Herald, Miners, Witness* and *Negocien Canadien*.

Plans were submitted, for inspection, of the improvements and enlargement of the harbour, being the same as those transmitted for the approval of the Government, on the 7th October last. These plans were fully explained by the Chairman; a good deal of discussion followed. They were, however, unanimously approved of by the gentlemen present, as shown by the following resolution:—

“Moved by Sir Hugh Allan, seconded by Mr. Ryan, M.P.:

“That this meeting approves of the general features of the plan prepared, as a step in the right direction for improving the harbour accommodation; but it ought to be coupled with an extensive system of coal wharves in rear of the stores on Mill Street, and a channel of approach to the same, outside of the shoals opposite the harbour. The proposed wharves at Hochelaga, for the accommodation of the lumber trade, will greatly relieve the harbour; and, with the same view, the coal wharves should be made as early as possible.”

“(Signed) H. H. WHITNEY,

“Secretary.”

“(Signed) A. M. DELISLE,

“Chairman.”

Mr. Delisle continued—The plan had been prepared by Mr. Nish, then Harbour Engineer showing what was considered would meet the necessities of the trade at that time; and I am not aware that it has increased much since. I was superseded in the office of Harbour Commissioners with my colleagues, who, like me, were named by the Crown, on the 26th March, 1874. The plan to which I have referred, as it is not before the Commissioners at present, I shall briefly describe. It embraces breast wharves from the entrance to the Lachine Canal, down to Hochelaga Bay, at Ruisseau Migeon, with a basin to subserve the wants of the coal trade at Windmill Point, in front of Mill Street, as it did docks with another basin; and docks at Hochelaga Bay, intended principally to subserve the wants of the lumber trade. It was intended that the wharves along the river, the whole extent of the harbour, should have a railway track placed in connection with the shipping. The breast wharves were to be built as they are to-day; but I presume it may be necessary to have jetties or piers off them, at convenient points, to increase the accommodation of the harbour, at a future time. The plan I have referred to, exhibits what, in my opinion, will suffice for the wants of the trade for years to come. There are two railroads projected, and it is pretty certain they will be built; each having a terminus at Hochelaga Bay; the North Shore Railway from Quebec, and Northern Colonization running up the Ottawa. As it will be necessary to connect with the

Grand Trunk bridge from these stations, and with the western portion of the country by the Grand Trunk, in addition to the railways placed on the level of the wharves at present, it will, in my opinion, be imperatively necessary that rails should be placed upon a higher level, that is, the level of Commissioner street, to subserve the wants of the trade of the port, especially during the winter season, when the lower level will be submerged. I would say that I am aware there is great prejudice in the trade about moving the business from the locality where we now sit, the centre of the harbour; but that, of course, must have a limit. I am an owner of warehouses in this vicinity, the centre of the city, and whatever course is adopted I am either benefited or damaged, but I cannot close my eyes to the fact that you cannot put within a given space more than a certain number of vessels or ships.

Q. Suppose that the piers at the present centre of business could be extended outwards, without trenching upon the navigable channel of the St. Lawrence, would you advocate any such extension into the river?

A. As this would necessarily tend to afford a large amount of accommodation in the centre of business, at a comparatively small cost, I would advocate it.

Q. Would you recommend the construction of piers at Hochelaga for other purposes than lumber or coal, until the piers at the present centre of business shall have been extended to the utmost practical extent?

A. My answer to that would be, I would, when the time arrives, and when it became urgently necessary to do so, recommend the erection of piers below at Hochelaga, but not until then. I can readily understand the prejudice which exists against ships landing their cargoes at Hochelaga Bay, for the simple reason that the warehouses of the city are very remote from that point, but there can be no possible difficulty to the erection of warehouses along the hill bordering upon that wharf at Hochelaga Bay, without incurring any risk from the shoves of the ice. The fact is, there are several houses built there at present, and I could not better evidence my views than by referring to Molson's brewery, the walls of which are washed by the waters of the St. Lawrence at the most dangerous part of the river.

MR. WILLIAM WORKMAN, as former Member of the
Harbour Commission.

Regarding extension, or improvements of the Harbour of Montreal, it has always been my opinion that touching the first (extension), the voice of nature has spoken as loud and as distinct as any evidence or opinion could do on the subject. Nature indicates Hochelaga as the point for extension, when the space opposite the city proper

is fully utilised. The great depth, close up to the beach, the volume of water, the favourable bay-shape, and comparative stillness of the water-sheet there,—all point to “Hochelaga Bay” as the proper place for finding additional harbour space when required.

It is true that Jacques Cartier, in his love for climbing streams, came up a little too far, when he first explored, and passed the very spot where our city should have been located, and where, in modern days, the Lachine Canal should have met the city, and connected with the St. Lawrence River. But it is no less true, that the day is not distant when we will have, partially, to remedy this mistake by going down with our harbour extension to the spot over-looked by the great navigator.

Objections are made, I know, and very naturally, to extension in this direction, by owners of city property, that it would divert the business and shipping trade from the present city centre, and also entail long cartage on goods for the city discharged there. To remedy this cartage difficulty, a tram-way could be constructed from Hochelaga to the present dilapidated drill-shed, where there is a very large space to receive goods for city consignees.

Q. What is your opinion with regard to extension of *piers* opposite the city?

A. In my opinion it would be very desirable to do so, provided such extension would not increase the velocity of the current below the city; and from the water-shape of the harbour, being somewhat concave opposite the city, I am inclined to think that the current would not be much increased by the extension of piers,—say to a little below the line of St. Gabriel street; any extension of piers below this, would, in my opinion, increase the current. Improvements in this direction should be tried to the utmost, before extension to Hochelaga, in view of existing investment of capital in city property.

Mr. Bell—What about warehouses at Hochelaga, for grain and general purposes?

A. Only create a harbour there that will bring vessels to it, and the question of stores or warehouses will solve itself. Stores will follow, and capitalists will erect them as soon as circumstances and trade indicate their necessity.

Mr. Bell—We have been informed that the steam vessels require to discharge opposite the centre of the city, because the goods have to be carried off in carts; and besides that, they require to receive at the same place their wheat cargoes; such being the case, do you consider Hochelaga would suit as well as the position opposite the centre of the city.

A. Not as well, certainly, under existing circumstances; but the same circumstances that now make these points convenient and desirable for the purposes named, could be created below,—except the mere difference of length of cartage, (which is a minor matter) I see nothing to prevent vessels receiving wheat in Hochelaga Bay, as conveniently as opposite the city, and even more so.

General Newton—What is your opinion as to the project of creating docks at

Point St. Charles, on the scale indicated by the plan submitted, designated Hydraulic Docks at Point St. Charles?

A. In common with the great majority of the people of Montreal, I have always looked upon this project as a Utopian scheme.

In the first place, with such a splendid sheet of water below the city, now lying comparatively waste, it seems preposterous to think of climbing up and dumming up, a shallow current above it, to create, at vast costs, shipping accommodation which we have already for nothing, ready and most convenient. Vessels to reach docks at Point St. Charles would have to pass through a canal and a number of locks, whereas the accommodation at Hochelaga is open, convenient and ready for easy use. It also seems to me most absurd to force ships, with goods for consignees in the city, to proceed a mile or more past the doors of the consignees of these goods, and then to have to cart the goods back again into the city. And here the absurdity amounts to an impossibility, because the cartage could not be performed at all under the present facilities for doing it, over but one bridge, and that a draw-bridge over a canal, which has to be opened during the navigation season every five minutes, to allow canal craft to pass through. The present thoroughfare over this bridge is limited merely to the *cul de sac*, Mill street business, and yet, during navigation, there may be hourly seen numbers of carts and vehicles blocked up on both sides, waiting the closing of the bridge for a chance to cross over. Imagine the extent of this obstruction, if the great thoroughfare in connection with the discharging of a number of ships was thrown upon this bridge. I know that a remedy for this difficulty is suggested in the creation of more bridges, but as these bridges would all have to be draw-bridges, and the space for erecting them is very limited, they would all have to be opened the same number of times, and from their contiguity and the pressure of canal craft, might all be open together. I can, therefore, see no remedy in this suggestion for the difficulty complained of. It is one of the insuperable difficulties growing out of the gigantic blunder of placing the Lachine Canal where it is.

The water-power intended to be created by this plan, for milling purposes is, in my opinion, somewhat visionary. In the first place, the comparative value of water-power is yearly decreasing, under the vast improvements and facile modes of placing and employing steam-power; and, in the second place, I have strong doubts as to the safety of mills in such an exposed position, under the Herculean and Quixotic ravages of our annual ice-shoves. I deem it unnecessary to fatigue you with the relation of other and numerous grave objections to this, in my humble opinion, very foolish project of creating "docks at Point St. Charles." Were there none other but the vast cost of such works, that would suffice to convince any reasonable mind of the danger and injustice of entailing such an increased tax upon the trade of our port, at a time when all the navigating world are seeking cheap channels, and, as much as possible, shunning expensive ports of entry.

It is to be regretted that, in discussing this subject heretofore, the spirit of party or prejudice has been more conspicuous than the coolness and judgment of impartial reason.

General Newton—What is your opinion as to a tunnel under the Lachine Canal ?

A.—Why, of course, you can construct a tunnel there—no difficulty in that. The difficulty exists, from the lowness of the level, to find drainage to keep it clear of water ; and in the frequent river-rising floods or inundations, which would fill it up.

As to shutting out water by any process of cementing or otherwise, that, in my humble opinion, would be impossible.

The present Wellington Bridge crush, and danger from the rails crossing it, is quite unnecessary, so far as the rails are concerned. The Grand Trunk should be compelled to remove the track from the bridge at once, and seek more easy access to the port across St. Joseph Street, somewhere near Cantin's works, and along William Street, or from the Bonaventure Station into William Street. It seems very absurd that the Grand Trunk Railway should entail upon itself two canal crossings, in its ingress and egress to and from the city, when it could enter the city by a more direct route, and one free from the Wellington Street Bridge crush, without any canal crossing at all.

Q. What are your views regarding increased accommodation for western produce ?

A. My opinion on this subject has always been, that in view of the annoyances and difficulties inseparable from crossing the Lachine Canal, which we have been noticing, all basin or canal dock extension should be kept on the north, or city side of the Lachine Canal. The frequent "water rising" in Griffintown keeps landed property there at a low figure. Basin space in the very centre of Griffintown could, therefore, be obtained, by expropriation, at a comparatively moderate price. The excavations from these basins would not only be a blessing to Griffintown, but to the whole city, in raising and making more healthy that locality. The land access to these basins from the city would be easy, by some twelve different streets, exclusive of the great central thoroughfare, Wellington Street. The houses where these basins might be constructed are comparatively sparse, and of an inexpensive class, and the Grand Trunk, now running through Griffintown, could find easy connection with the business, as well as with the canal.

Vessels desiring wheat or flour freight could, by enlarging the lock, ascend from the harbour proper, take in their freight, either from elevators or stores in these basins, and when loaded, quietly drop down into the river ready for sea. A large number of vessels could also be wintered here, free from ice danger, and repairs and alterations could go on during winter, which would give winter employment here, besides having the vessel on the spot ready for spring action on opening of navigation.

For these reasons, in my humble opinion, the Government, in erecting or making such extensive basins on the south side of the canal, and overlooking the locality pointed out in Griffintown on the north, or city side, *are making a very grave mistake.*

With regard, however, to the whole subject of harbour extension or accommodation, it has always been my opinion that there should be a moderate limit to it, lest, by gigantic strides, we over-reach our normal requirements, and prematurely saddle our port and trade with a heavy burthen of debt, and consequent exorbitant harbour dues, which may drive shipping away from us.

Two facts stand out in the problem, and they cannot, and ought not, to be overlooked.

1st. So long as the United States Government exact *ad valorem* duties on goods purchased in Canada, on the cost price in Canada, we will never be able to sell goods to the Western States, and, consequently vessels coming here with western produce will get no back freight, and will have to seek compensation for the empty up trip, by a corresponding extra rate for down freight, on the western produce coming here.

2nd. So long as we cannot sell to the United States, for the reason above stated, our own imports of goods or merchandise can only be equal to our own consumption or home market. Our shipping or tonnage will, therefore, only be equal to that, and our normal exportation of produce can also only be equal to the same. Any produce shipped beyond this must find freight in vessels coming out here in ballast to receive it, and they must seek compensation for the empty out trip, by a corresponding extra rate of freight on the home full trip, on the western produce going from here. In other words, the full trip home must pay for the two trips.

This state of things, inseparable from our geographical and political position, must always place us at a great disadvantage, as compared with New York, in the struggle for western produce. Vessels from Europe to that port always find abundant freight; and vessels from that port, returning to the west, always return well laden. The difference, from the above circumstances, in favour of New York, operates just so much against Montreal. Besides, the Port of New York is open the year round; that of Montreal is closed five months of the year. Constancy and regularity are important elements in the attraction and retention of trade in large staples. The business connections which naturally concentrate on New York, from her ability to supply the western merchant with goods, and her open port the year round, will hardly be suspended in favour of Montreal during her summer months of open navigation.

These remarks are not offered with any feeling of disparagement towards Montreal, but simply as a caution against entering upon enormously expensive dock schemes, having specially for their object the permanent attraction from the port of New York of the general western produce trade, which has been directed and concentrated there by the circumstances above referred to, and which neither docks nor harbour works of ours, under existing circumstances, can take away. Let us, therefore, beware of creating a big debt upon our port, which, for all future years, may hang like a mill-stone on the neck of our commerce, and thus, in place of increasing, seriously impair the future progress and prosperity of our shipping trade.

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Mr. DAVID SHAW, Shipping Agent.

We want as much accommodation as possible from the Quebec Gate Barracks up to the canal; but it is difficult to get it all in that part—for instance, the parties that receive the goods here refuse to receive below Victoria Pier.

Mr. Bell—Where is your line located now?

Mr. Shaw—At Prince's Basin. I have got steamers and vessels at different parts of the harbour.

Mr. Bell—Where is your principal wharf?

Mr. Shaw—At the Prince's Basin, and some vessels at Commissioners' Wharf. These (places indicated) are all good places for steamers. Merchants object to go below Victoria Pier for goods. I would have no objection to go down there to the pier at the head of Commissioners' Wharf, because I think it is the best place for steamers. I have both steamers and sailing vessels. My steamers vary from 2,400 tons to 600 tons. I have got ocean steamers drawing from 19 feet 6 inches to 22 feet. From early spring to July, we sent them up drawing 22 feet; but we cannot send them now drawing more than 19 feet 6. I have transient vessels coming from different parts of England; in the latter part of the season these transient steamers brought out general cargoes. It is not particular what part of the harbour vessels bringing coal and iron are berthed in. The Grand Trunk takes nearly all the rails away, and what they do not, goes away by water. The transient steamers that I have coming here are sometimes loaded all grain, and other times with grain and flour.

Q. Do you load at the same places where you tranship your inward cargoes?

Mr. Shaw—Yes. Merchants sometimes refuse to cart flour so far down. It would be a good thing to have grain stores down there, and I have no doubt it would be a convenience for ships and for the trade generally; so that as the ship discharged, they could go on loading. There are many vessels that come here in ballast for cargoes of grain; this year there has been a good many. They have to go any where in the harbour. The bulk of the British ships coming here come loaded. Hochelaga is the right place for the lumber trade. I think light vessels should be kept down below the Victoria pier. We would find it difficult to get vessels up the current but for the chain tug. What I object to with that is the charge; they charge three cents per ton.

Mr. Bell—Do they make a revenue of it?

Mr. Shaw—They must have this year. I think there should be nothing but a nominal charge, for the lower they keep harbour dues the more business we shall attract to the port.

Mr. Bell—What do you consider should be done to give greater accommodation?

Mr. Shaw—Run a pier down from Windmill Point, parallel with the current, with a draw-bridge connecting it with the main shore, so as to load vessels on both sides.

That is the cheapest, so far as I can see, for the requirements of the trade. I would also run out the present piers a little further. We want the accommodation as near the harbour end of the city as possible.

Mr. Bell—How would it answer to build a low water wall from the abutment of the Victoria Bridge, carried down in a line to the end of Victoria Pier, giving sufficient entrance to the basin, and, inside of this, to take a perpendicular pier from the lower end of Allan's wharf, and strike out piers at right angles to those pointing down the river?

Mr. Shaw—That, I think, would meet the requirements of the trade at present, as vessels could sail up the river into the berths at once, and have room for turning. I think that would answer all the requirements of the trade for a considerable time.

Mr. Bell—Besides that, they could have the Wind Mill basin?

Mr. Shaw—Yes; that comes in very well now. I suppose anything would be objectionable that would interfere with the present accommodation; you could not take away any of the accommodation there is at present. Docks would not suit down here at Hudon's wharf.

Mr. Bell—Would store-houses for your general goods be of advantage?

Mr. Shaw—I don't think so; we have got sheds.

Mr. Bell—How would it answer to lock up steamers into a dock?

Mr. Shaw—It would never do in this country to commence locking large steamers; we have too short a season; you could not lock one of these 400 feet steamers under two or three hours.

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TENTH DAY'S PROCEEDINGS.

The Board re-assembled on November 2nd, at Ten o'clock, and the hearing of evidence was resumed by the examination of

MR. WM. J. PATTERSON, Secretary of the Board of Trade, and of the Corn Exchange Association:—

Having recently heard of a report and plan relating to the harbour of Montreal, prepared about forty years ago by Mr. Peter Fleming, C.E., I have endeavoured, with partial success, to find out where they are. The plan, it is expected, may be discovered,—a trace of it is found at Ottawa; the report is recorded in the archives of the Montreal Board of Trade, under date January, 1830, and I shall, no doubt, be instructed by the Council of that body to bring these documents officially to your notice. I hope, also, to be able, by the kindness of the City Clerk, (Mr. Glackmeyer) to show you a certain Canal and Dock plan which was communicated to the Board of Trade in 1841.

On the question of harbour improvements, after the full statements and explanations which have, no doubt, been made by the well-informed gentlemen who have given their views on the subject, I fear anything I may say will not be of much service to you in your investigation. The figures relating to our city's trade have already, I understand, been adduced or referred to, and your attention has also been drawn to statements respecting the trade of the Canadian canals, which have been given in the Report of the United States Senate Committee on Transportation. The summaries given in volume I. of that valuable document are, so far as I have examined them, correct, having, I believe, been deduced partly from statistics and other information, which I recognise as furnished by me at the instance of the Boards of which I am Secretary.

In common with most of those who have given careful attention to the question, I entertain a very decided opinion as to the immediate and prospective need for enlarged accommodation in the harbour of Montreal,—my views being founded upon the record of the past growth of our commerce. I have at hand a statement for each year (made up from Customs' Returns) of the value of the general Imports and Exports of the port, as far back as 1833. The summary, now submitted, shows the

annual average values for periods of five years, up to the time of Confederation,—the latter half of the statement showing actual annual values since 1867:—

	IMPORTS.	EXPORTS.
1833-'37.....	3,543,066	1,154,270
1838-'42.....	5,428,263	1,593,711
1843-'47.....	8,515,324	2,652,450
1848-'52.....	7,835,775	2,053,874
1853-'57.....	15,120,321	2,692,086
1858-'62.....	16,019,584	6,257,950
1863-'67.....	24,301,702	6,730,564
1868.....	22,917,904	10,855,860
1869.....	24,097,648	16,749,210
1870.....	31,524,861	19,027,153
1871.....	35,504,334	24,133,510
1872.....	45,675,016	23,687,912
1873.....	40,714,179	31,072,879
1874.....	43,479,482	

You will see, at a glance, that the increases have been large, and, I may say, steady, since Confederation,—the average annual increase in values of imports being 43.38 per cent. as compared with the average of five years, from 1863 to 1867.

You have, I suppose, already been furnished with figures respecting the tonnage of the port. I would, nevertheless, submit a statement from 1864, which shows the ratio of increase of the whole sea-going tonnage from year to year, and the proportion of Steamship tonnage included in that total:—

Years.	No. of Vessels.	Total Sea-going Tonnage.	Increase or Decrease compared with preceding years.	Proportion of Steam Tonnage to total.
1864.....	378	161,901	.....	36.48 per cent.
1865.....	358	152,943	Dec. 5.00 per cent.	51.00 "
1866.....	516	205,775	Inc. 34.54 "	36.68 "
1867.....	464	199,053	Dec. 3.27 "	43.80 "
1868.....	478	198,759	" 0.15 "	51.00 "
1869.....	557	259,863	Inc. 30.72 "	41.51 "
1870.....	680	316,846	" 21.93 "	42.26 "
1871.....	664	351,721	" 11.00 "	41.77 "
1872.....	727	398,800	" 13.39 "	54.59 "
1873.....	702	412,478	" 3.43 "	53.00 "
1874.....	751	423,423	" 2.65 "	61.90 "

These figures show that from 1864 to 1874 the total sea-going tonnage of the port increased 161.53 per cent., and the steamship tonnage 343.69 per cent.

The increased capacity of ships coming up to Montreal is indicated by the following memoranda from the Harbour Master's Register, showing the draught of water of vessels clearing at the Custom House during the past six seasons:—

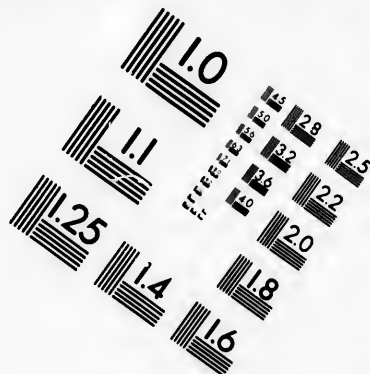
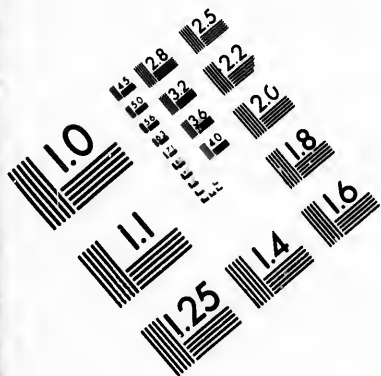
	18 feet and over.	19 feet and over.	20 feet and over.	21 feet and over.	22 feet and over.	Total drawing 18 feet to 23 feet
No. of Vessels in 1869	41	26	38	14	6	125
" " 1870	68	48	17	5	None.	138
" " 1871	97	47	18	7	2	171
" " 1872	95	63	21	4	2	185
" " 1873	86	52	30	17	7	192
" " 1874	73	39	29	18	12	171

In the season of 1873, four vessels cleared from Montreal drawing 23 feet; in 1874, there were clearances at 23½ feet.

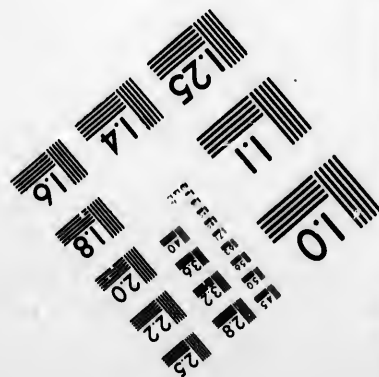
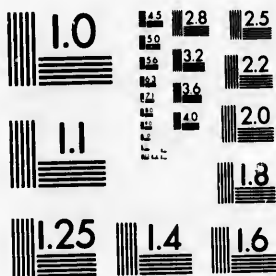
I would also ask an examination of a summary of our Imports and Exports of Breadstuffs, in connection with what I have just submitted. Rather than encumber you with a long series of yearly figures, I have prepared a statement, showing *average* annual results at the port of Montreal, deduced from periods of five years since 1846, —including the receipts and shipments of flour, wheat and corn, as follows:—

PERIODS.	FLOUR—Barrels.		WHEAT—Bushels.		CORN—Bushels.	
	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.
1846-'50 . . .	545,171	269,574	533,191	324,205	29,326	1,144
1851-'55 . . .	520,014	173,315	628,125	218,144	309,181	40,518
1856-'60 . . .	597,054	203,463	1,608,184	801,307	216,394	45,847
1861-'65 . . .	1,020,847	662,722	5,724,858	3,804,228	1,234,651	929,353
1866-'70 . . .	853,955	757,880	4,021,944	2,862,029	664,120	553,698
1871-'75 * . .	962,453	803,351	7,382,918	6,561,234	3,736,072	3,572,871

* The quantities in 1875, only include up to 6th October, '75.



**IMAGE EVALUATION
TEST TARGET (MT-3)**



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According to these figures, the maximum average receipts of flour for the period of thirty years occurred during the five years 1861 to 1865,—the average shipments being greatest from 1871 to 1875. The increase in receipts of flour in 1865 over 1846 was, therefore, 87 per cent.; the increase in shipments in 1871 to 1875, over the average of 1846 to 1850 being 190.76 per cent.

The figures relating to average receipts of wheat during the period embraced in the table, shew an increase in 1871 to 1875 of thirteen fold,—shipments having increased nearly twenty-fold. The largest receipts in any one year, were 9,788,730 bushels in 1873, and largest shipments 8,225,649 bushels in same year.

The corn trade has developed to its present proportions within a period of fifteen years.

Now, my general theory is that the future increase of population in the Dominion, especially the filling up of the North-west Territories, to which we may fairly look forward, will largely increase the import and export trade *via* the River St. Lawrence, and, of course, render an increase of accommodation in the harbour of Montreal a matter of imperative necessity, while, I think, the enlargement of the Welland and St. Lawrence canals will ensure a great increase in the grain carrying trade. The quantity of the cereal productions of the Western and North-western States seeking transportation to the Atlantic seaboard, appears to be constantly increasing; but while the Erie Canal can carry produce for nearly one half the rates charged by the New York Central and the Erie Railroads, it appears to be barely doing that share of the trade it secured years ago, the railway business in food carrying being steadily on the increase. My opinion, therefore, is that by the enlarged Canadian canals affording greater capacity, consuming much less time on the distance from Buffalo to tide water, and doing the service for lower rates, the St. Lawrence route will attract far more traffic than heretofore. This appears to be a prevalent opinion in some parts of the West, and notably that of the editor of the *Chicago Tribune* and other well-informed parties. It may be stated in this connection, that during the past twenty-five years the average length of the season of navigation was :—

Lachine Canal.....	219½ days
Welland Canal.....	234 “
Erie Canal.....	215 “

General Newton—Do you imagine the enlargement of your Canadian canals would draw off trade from the strong Railway Corporations you have named?

Mr. Patterson, continuing—I am well aware that these Railway Companies are very powerful, and their influence can control business to an immense extent, and keep it in their own channels; but I feel sure that, in the long run, the lower rates and rapidity of transit, would tell in favour of the Canadian route. Then, again, the Oswego interest is a strong one, and that city will undoubtedly be immensely benefited by the enlarged Welland; but once brought down to Lake Ontario,

Montreal will offer a choice of shipping ports, with, it is to be hoped, such competing rates of freight as will attract a larger share of the breadstuffs carrying trade.

Q.—You show that the arrivals of flour in Montreal have not increased proportionately with wheat; what quantity of flour is produced in Montreal? Is the flour-milling business of your city increasing?

Mr. Patterson.—The quantities of flour produced by the mills in this city, are as nearly as I have been able to ascertain from time to time, during the past eleven years, as follows:—

1864.....	335,827	Brls.	1868.....	372,246	Brls.	1872.....	358,708	Brls.
1865.....	425,133	"	1869.....	361,321	"	1873.....	325,000	"
1866.....	260,151	"	1870.....	350,071	"	1874.....	297,000	"
1867.....	285,857	"	1871.....	322,765	"			

The average of these eleven years is, curiously enough, 335,825 barrels, or *two* barrels less than shown by the figures for 1864. The present flour-milling capacity of this city is, I may safely say, very much greater than would be inferred from the figures I have given. I suppose that the increased and increasing demand for the grain in bulk, for shipment to Great Britain, will account, to some extent, for the much slower growth of our flour-milling trade, there being this other reason,—the increased production of flour throughout the Province of Ontario. The flour trade between Montreal and the Maritime Provinces is very considerable, and probably growing. The connection during winter is by railway to Portland, and the traffic returns have not been available in such a form as to admit of analysis, considerable quantities passing through from points west.

Q.—Would an increase of available water-power increase flour-milling in Montreal?

A.—I doubt much whether it would. Of course, I am most desirous that every industry and manufacture in our city should increase and prosper; but I imagine that the centralising of flour-milling in Montreal will be prevented by the utilising of the numerous water privileges which exist throughout the country districts, these forming the nuclei for population and other industries.

Q.—Can you tell us what proportion of the breadstuffs received heretofore in Montreal, came from the Western and North-western States?

A.—I cannot say accurately. Approximately the wheat and corn which arrives at Kingston, and is there transhipped to this city, is supposed to represent the quantities of Western States grain. The Collector of Customs at Kingston has furnished, from time to time, returns which indicate arrivals of grain at that port by lake. Considerable quantities of grain are brought every year to this city by propellers, which ply between Chicago and Montreal, without touching at Kingston. I find on page 175 of volume I. of the Report by the United States Senatorial Commission on Transportation;—"It is stated by the Secretary of the Board of Trade at Montreal, that of the

"total quantity of grain received at that city during the year 1872, 9,055,000 bushels were transhipped at Kingston, and only 3,266,000 bushels were carried through to Montreal in lake vessels. Almost all the grain transported on the lakes in sailing vessels, was transferred to barges at Kingston."

Q. One gentleman who has given evidence is of opinion that the United States may not, some time in the future, have a surplus of breadstuffs to send to Europe. What effect do you think such a contingency would have on the carrying trade by the enlarged canals?

A. I believe that if the existing export grain trade to Europe should decrease largely, the canal system of Canada would still be used as a cheap medium of transport for breadstuffs from the Western States, for consumption in the Eastern States.

Q.—Have you given any consideration to the *immediate* need of increased harbour accommodation?

A.—Taking into account an augmenting trade, the harbour accommodation should be made adequate for the probable increase of the next ten years. Our season of navigation is very peculiar; it continues, on an average, for about seven months, but the active parts of that time are included in from three to four months. When navigation opens there is activity in receiving and shipping breadstuffs from the westward, and receiving merchandise by the spring fleet, which continues more or less throughout the month of June; then there is a lull during July and August, and until about the middle of September,—great activity being the rule thereafter until the season closes. The greatest number of sea-going vessels in port at one time during the past twelve years were:—

1863	.....	86—June 13	1869	.....	61—Nov. 4
1864	.....	32— " 23	1870	.....	62—June 20
1865	.....	42—Oct. 19	1871	.....	89—Oct. 27
1866	.....	91—June 13	1872	.....	84— " 30
1867	.....	59—Oct. 21	1873	.....	84—Aug. 28
1868	.....	51—June 24	1874	.....	76—July 6

I need not inform you that on each of those dates there were a number of vessels without berth-room. The *immediate* want in the harbour is, therefore, accommodation for, at the very least, the maximum number of sea-going vessels heretofore in port at one time. As far as I can recollect, I concur with the views expressed by Mr. Watt, whose evidence was given in my hearing.

Q. By General Newton—Can you remember any of the particulars, in reference to which you coincide in opinion with that gentleman?

A. I think the present wharfage accommodation should be progressively increased, so as to be doubled in four or five years,—and thereafter doubled again within the decade.

Q. Do you imagine that the increase you indicate, will be all that may be needed in future?

A. That is rather far-reaching. Necessity for future increase would depend very much upon the available space afforded on the wharves and jetties in any plan that you may recommend. I am of opinion that an adequate scheme for harbour improvements ought to include a commodious basin, suitable for vessels of large draught of water.

Reply to question by General Newton—It appears to me that such a basin should be a high-level one,—vessels to be locked in and out. A basin in front of the city, on the principle embodied in the Government plan of harbor improvement, seems to be a most desirable one,—to maintain a high level of deep, still water, and to provide for overcoming the current St. Mary. I mean by the "Government Plan," the one prepared by J. G. Sippell, Esq., C.E. I think, however, that Mr. Sippell's plan might be improved upon, (but that is an engineering point) by starting his retaining wall from the abutment of the Victoria Bridge.

Q. What do you think of the Wellington basin, and the Mill Street basin now constructing?

A. I suppose they were considered part of some canal improvements,—but their depth of water (18 feet, I understand) would properly enough allow them to be classed along with any scheme of harbour improvement. I believe that two of the three would have been more serviceable had they been located on the city-side of the canal, thus avoiding the inconvenience and delay which are often incident to crossing the canal. One of them would certainly be required in close contiguity to the Grand Trunk sheds at Point St. Charles. Any plan of harbour enlargement should include adequate provision for the Lumber and Coal trades of Montreal—both branches of commerce having attained to large proportions. For the convenience of both trades at the West End, suitable accommodation ought to be provided in the canal,—while, as has been appropriately suggested, ample accommodation for both the lumber and coal trades could be got by utilising Isle Ronde. The following figures will shew the magnitude of the export lumber trade:—

YEARS.	Total shipments recorded at Custom House.		Proportion shipped to South America.	
	QUANTITY FEET.	VALUE \$	QUANTITY FEET.	VALUE \$
1867.....	3,783,000	45,059	1,412,128	18,409
1868.....	11,981,000	142,853	6,764,277	114,167
1869.....	27,439,000	271,128	13,806,276	202,523
1870.....	28,086,948	427,635	24,998,914	353,415
1871.....	19,757,050	253,584	17,536,565	226,443
1872.....	32,528,000	521,236	29,149,499	450,830
1873.....	.....	.....	31,594,966	606,803

The export trade in lumber to South America has fallen off very considerably in 1874 and 1875, owing to sundry difficulties in that country, which, it is hoped, will ere long be obviated.

Q.—What provision would you have for supplying lockage water for a high level basin ?

A.—I would be disposed to ask, in reply, if not from the canal, could not the river be tapped somewhere not far above the Victoria Bridge ?

General Newton—Do you suppose that the warehouses and elevators between the canal and Mill street will afford, in the future, sufficient capacity for the storage of grain ?

A.—The existing arrangements for the warehousing and handling of grain would, I think, be quite ample enough for a very much larger trade in grain than has existed, or is likely to occur, for years. The grain storage is at present adequate for over 2,000,000 bushels, and it has not been anything like used to its capacity. The Mill Street wharf will, if I mistake not, soon have depth of water for larger vessels, and the elevators at the warehouses in that vicinity could receive grain from vessels in the canal, and spout it direct into sea-going vessels at Mill street wharf. Taking into account the capacity of the floating elevators, an immense increase in the grain trade could be accommodated by existing warehouses and elevators.

Mr. Bell—Do you think the building of such warehouses on the wharves would bring trade to the port ?

A.—That is very doubtful ; it would depend upon the facilities you provide for importations and shipments.

General Newton—And that would further depend upon the general prosperity of the country, and the harbour dues ?

Mr. Patterson—Yes ; the reduction to the utmost limit of all expenses on ships visiting this port.

Q.—What is the general view of commercial men, with respect to the amount of harbour dues ?

A.—So far as I am in a position to know, the actual harbour dues are not so much complained of, as the general expenses incurred. A large proportion of that expense is for towage, which is complained of as a great burden.

Q.—How would you propose to obviate that ?

A.—Really, I cannot say. I would imagine that it is not desirable to diminish private competition in towage. But the Government or Harbour Commissioners might make some provision in the shape of powerful steamers, that would do the service at moderate paying rates, and in that way regulate prices, and prevent overcharge.

Mr. Bell—If the revenue of the harbour to-day would admit of borrowing \$1,000,000, do you suppose the Harbour Commissioners would be justified in borrowing

double that amount, to be spread over ten years, for providing adequate progressive enlargements?

A.—I am sanguine enough to think they would. It must be borne in mind, of course, that the trade of Montreal is not yet permanently established; that one great element of it—the through grain trade—is somewhat fluctuating and uncertain, owing to the competition of other routes upon which immense capital is employed; but there is sufficient hope of maintaining this trade to authorise the City of Montreal in putting forth every reasonable effort to obtain that sum. I feel justified in the view I take, by the steady progressive increase which has been going on for the last quarter of a century. Besides that, if this money is carefully borrowed, expended in the execution of a progressive plan, the facilities you give them will bring in an increase of revenue.

ADDITIONAL STATEMENTS.

After the foregoing evidence was given, Mr. PATTERSON was requested by the Secretary of the Commission of Engineers to furnish information as follows:—

“1st. As to the export grain trade. What proportion goes out by the ‘general cargo’ vessels, or regular lines, steam and sail; and what by transient vessels chartered specially?”

“2nd. The cost and charges in detail, by items, of transporting a bushel of grain from Chicago or Milwaukee to Liverpool.”

“3rd. A scale of cartage.”

The result was the communication of the subjoined particulars:—

INQUIRY I.

By Regular Traders.....	Wheat	3,834,963	bushels.
“ “	Corn	1,021,466	“
“ “	Peas	801,596	“
Total “ “		5,658,025	“
By Transient Vessels.....	Wheat	2,927,438	bushels.
“ “	Corn	647,858	“
“ “	Peas	551,914	“
Total “ “		4,127,210	“

It appears by a careful scrutiny of shipments of grain (viz.: wheat, corn and peas) via the River St. Lawrence, during the season of navigation of 1875, that of the aggregate 9,785,235 bushels shipped, 57·81 per cent. was exported in *regular traders*, and 42·19 per cent. in *transient vessels*.

INQUIRY II.

(a) *Loading at Chicago:*

All grain purchased in Chicago and Milwaukee at market quotations, is subject, during the season of open navigation, to a fixed charge for "storage" of 2 cents per bushel.

(b) *Transport to Montreal:*

The usual course of transportation is by schooner, carrying 18,000 to 20,000 bush., to Kingston direct, passing through the Welland Canal.

Another route is by vessels of larger size, 30,000 to 35,000 bushels (mostly steam propellers), from Chicago to Port Colborne, at the foot of Lake Erie, thence by the Welland Railway to Port Dalhousie, at the head of Lake Ontario, where it is again transferred into vessels for Kingston.

When freight charges range at higher figures than have been current during the past season, shipments are made from Chicago to Collingwood, on Lake Huron, thence by the Northern Railway to Toronto, and by vessels to Kingston, as before.

At Kingston, the grain is transferred into river barges, carrying 18,000 to 20,000 bushels, which are towed to Montreal.

Shipments are also made from Chicago and Milwaukee to Montreal direct, sometimes in small schooners, but oftener in steam propellers, carrying 16,000 to 17,000 bushels to Kingston, and 10,000 to 12,000 bushels thence to Montreal. Also, by large vessels, 30,000 to 40,000 bushels, from Chicago to Goderich on Lake Huron, and thence by Grand Trunk Railway to Montreal.

The freight charge for transporting a bushel of grain from Chicago to Montreal, by either route, is substantially the same. Neither railways nor steam propellers can command a higher price over sailing schooners and barges.

During the past season, the inland rates of freight have varied very little. Probably three-fourths, and over, of the receipts at Montreal have been carried at prices within the following quotations:—

	¢	BUSHEL.
Chicago to Port Colborne.....	3	to 4 cents.
The Welland Railway.....	1½	to 1½ "
Port Dalhousie to Kingston.....	1½	to 2 "
	6	to 7½ cents.

	¢	BUSHEL.
Chicago to Kingston direct.....	6	to 7½ cents.
Kingston to Montreal.....	3	to 3½ "
<hr/>		
Chicago to Montreal is thus.....	9	to 11 cents
Marine Insurance.....	¼	to 1½ "
<hr/>		
Total.....	9¼	to 12½ cents.

These prices include all the costs and dues *en route*, and deliver the grain free on board craft in the harbour of Montreal,—full delivery weight being guaranteed by the carriers; no ocean tonnage nor harbour dues, towage nor pilotage dues being chargeable on grain or other cargo of vessels. All such are payable by the vessel as part of her current expenses, and included in the freight charge paid to her. The export wharfage dues and Port Warden's fees are merely nominal, and do not amount to more than 30 cents per 100 bushels.

The rate of ocean freight by A1 iron clippers and steamers to Liverpool has fluctuated greatly during this season, ranging from 4s. to 9s. per quarter, as an extreme variation. Five shillings was probably the average of the season's business—a lower average than usual—and a price at which it is alleged that ocean vessels cannot earn profits.

5s. 0d. per quarter, is per bushel..... 15 cents.

Ocean Insurance ranges from ¼ per cent. to as much as
4 per cent. late in the season—an average of say,
per bushel 2 cents.

INQUIRY III.

A Scale of Cartage:

The "Tariff of Cartage" hereto annexed is the one fixed by the City Bye-Laws. While there are several lines of business in which parties employing carters conform to that tariff—such as some hardware and iron firms—yet, as a general rule, the rates for cartage are matter of agreement between carters and firms employing them, and may vary.

In the Dry Goods trade, the usual price paid to carters is 15 cents per package, to any part of the city, especially with carters who are in the habit of regularly doing the cartage business of particular firms. For transient cartage, there would probably be a higher rate charged than 15 cents per package.

In the Flour trade, the understood tariff is about as follows:—

From the Canal Sheds to "the Warehouse" or Stores, and <i>vice versa</i>	2 cents per brl.		
From the Stores, Sheds or Mills, to the harbour west of Quebec Steamers' wharf	3½	"	"
From the Stores, Sheds or Mills to the Quebec Steamers ...	5	"	"
To the "Long" Wharf (Victoria), and to Commissioners' Wharf	6	"	"

ELEVENTH DAY'S PROCEEDINGS.

The Board re-assembled on November 3rd, and proceeded to hear the evidence of

HON. THOMAS RYAN, Senator.

It is now some time since I have taken any active part in the affairs of the harbour of Montreal, though, as a member of the Legislature and as a citizen of Montreal, I regard the works in progress, both here and in the River St. Lawrence, and in Lake St. Peter, with great interest.

Some years ago, when feeling ran high between those interested in the eastern and western portions of the city as to the best location of the harbour, a committee of citizens was formed, including the late Mr. John Redpath, Mr. William Workman, Mr. A. M. Delisle and myself, to confer with the then Harbour Commissioners, and the opinion of that committee, backed by many leading citizens, was that sufficient accommodation might be procured about the centre of the city, in and about the site of the present harbour, with extensions eastward and westward, as the increase of trade might require.

After much discussion with the Harbour Commissioners, they agreed on the suggestion of the committee, to take the opinion of Mr. Trautwine, an engineer of standing, who was accordingly asked in, and made a report, which, with his maps and plans, as well as the correspondence between the committee and the Commissioners, will be found in the Harbour Offices. Although Mr. Trautwine's plans were not then acted on, and although a portion would now be difficult of accomplishment, on account of the enhanced value of property in and about Griffintown, yet docks in connection with the Lachine Canal, such as the Government are now constructing, formed part of his suggestions, as well as a change in the position of the piers for discharging and loading vessels.

Since the period I speak of, the trade of Montreal has increased immensely, and as I have ceased my connection with business for some years, my opinion of what is now required in the way of harbour accommodation is not of a practical character, but merely that of a looker-on.

Still, of all the plans of extension which I have met with, that emanating from the Public Works Department, and generally known as Mr. Sippell's, commends itself

to me as the best and most rational in many respects, viz: 1st, because it utilises the present harbour, and adds to its capacity; 2nd, because it can be taken up in sections, and the work be done gradually, if deemed advisable; 3rd, because it gives access to Hochelaga, which, I consider, ought to have been the original terminus of the Lachine Canal, avoiding St. Mary's current and securing a good natural harbour, to say nothing of the docks which are suggested at that point. I suppose, at a very rough estimate, the *Hochelaga section*, including docks there, might cost from two millions to two millions five hundred thousand dollars (from \$2,000,000 to \$2,500,000). The *canal section* from Hochelaga to Victoria Pier, \$800,000 to \$1,000,000; and the section from Victoria Pier, westward to lower entrance of Lachine Canal, \$1,400,000 to \$1,500,000. This is, of course, an unprofessional estimate.

Mr. Bell—What do you think about the increase in the trade of Montreal?

Hon. Mr. Ryan—I think it is sure to go on increasing, in proportion as we give ample accommodation to meet that increase. The position of Montreal at the head of ocean navigation, and connected with the interior by a magnificent system of water communication, as well as by rail, ensures the advent of a vast trade, provided accommodation is given, and given at a moderate charge, for there are many cities on the seaboard to contend for the products of the west, and to attract these to Montreal involves the necessity of a low tariff of harbour dues.

To insure such a result, I have always been of opinion that the cost of deepening Lake St. Peter and the River St. Lawrence should not be a charge upon the harbour of Montreal, but should be borne by the Dominion Government in the same manner as that of enlarging and improving our canals. What the intentions of Government may be for the future I know not, but the commerce of the Dominion will be enhanced in proportion as the trade and products of the west can be attracted to Montreal, and this can only be done by relieving this port from the heavy charges of carrying on works not really of local character, but of truly general interest.

Mr. Ryan also asked attention, as a possible future channel of supply, to the scheme of improving the navigation of the Ottawa and its tributaries up to Lake Nipissing, and thence descending, *via* French River, to Lake Huron.

MR. FORSYTH, C.E., formerly Harbour Engineer.

Mr. Bell—We are aware, Mr. Forsyth, that from your former connection with this harbour, as engineer, you may be able to give us information upon some technical points; one matter on which we want some information is the effect of the floods upon the quays,—what you consider in regard to the level of the quays,—whether the present height should be increased, so as to get rid of the floods in spring or autumn,—or whether they should be kept at the present height?

Mr. Forsyth—The ordinary level of the wharves in the Harbour of Montreal is about 8 feet 6 inches above low water, and the extreme high water during the floods you refer to (which usually take place during the months of June and July) is about 10 feet 6 inches above low water; these floods being caused by the drainage and melting of the snow in the northern waters of the Ottawa, and the tributaries of that river, and the St. Lawrence. For the accommodation of ocean vessels, the present level of the wharves is inconveniently low, while for ordinary river navigation it suits fully as well as an increased height might do: but to make all the wharves of a uniform height, I think 10 feet 6 inches would suit very well as a general level.

Were it not for the danger to the wharves by the ice, I would recommend those for ocean vessels to be at least 5 feet higher than those at present in use; but by adopting that plan, there would be great danger of the ice damaging them, either by shoving or by lifting.

The winter level of the water in the harbour is usually about 5 to 6 feet above the level of the top of the wharves; sometimes higher and sometimes lower; and, in the event of the latter circumstance (the ice being usually about 2 feet thick), there is danger of the top of the wharves freezing into the solid ice, and were this to take place to a considerable extent, there is danger that, in the rising of the water, the top of the wharves might thus be lifted; or, as the water is usually high when the ice *shoves*, if the wharves were too high they would likely be damaged on the more exposed positions. During my experience in the harbour, I have seen the wharves damaged from both these causes, most notably in the case of the "Victoria Pier," where the top planking was lifted as I have stated. With proper precautions in the construction of the superstructures, I believe that 10 feet 6 inches above the level of low water might, with propriety, be adopted as the general level for the wharfrage in the harbour.

In reply to Mr. Bell, Mr. Forsyth stated that the currents in the harbour are frequently diverted during the winter by the grounding of ice on the piers and shoals. This was particularly observable in the basin below the Victoria Pier, where the ice had shoved and grounded in the outer end of that pier, causing a large body of water to pass over the inner portion, and falling heavily into the basin below, washed out that part of the basin (which was a black sandy bottom) to a depth of 30 to 40 feet, and deposited the sand so removed in a bank a little lower down in the basin, as well as undermining several of the cribs of the now downward portion of that wharf. These current excavations I have also observed below the "*Island Wharf*," and also in the Channel off the "*Bonsecours Pier*." This matter was referred to in my Annual Report for 1862.

Mr. Bell—Do you think it would be an advantage, from your experience of this harbour, in giving increased accommodation, to make the works in a Basin, and raise the level of the water up to the height of the lower Basins of the canal, or to leave it open as now?

Mr. Forsyth—This question will require to be replied to at some length, as it is a very important one, and one to which I have before given some attention, involving what may be termed its financial aspect.

If money was no object, and the unlimited expenditure of it by the Harbour Commissioners in harbour improvements would not have the effect of necessarily increasing the *dues* on the shipping, and thereby driving the trade elsewhere, I would recommend some carefully devised scheme of docks, with a sufficient water supply from the Lachine Rapids, combining therewith water privileges for manufacturing purposes, connections with the Lachine Canal, giving graving dock facilities, &c., &c., and on a level with or near that of the basins of the Lachine Canal; but with the present trade of the harbour, or any likely increase of it for some years to come, I do not believe otherwise than that the construction of such extensive works now by the Harbour Commissioners, could have any other effect than that of paralysing its now steady increase, and by the levying of dues necessary to meet the interest on the outlay, would drive the shipping from the harbour of Montreal to that of Quebec, and those of the Eastern States.

If, however, this dock accommodation in the harbour would be undertaken by private enterprise, a charter might be granted to a strong company, carefully guarding the interests of the harbour, so as not in any way to infringe on it by concessions of dues to the harbour, or the compulsion of vessels being taxed for their docks, unless absolutely used, &c., &c., and having a saving clause that, at any time the Harbour Commissioners, by the expression of public opinion or vote, could assume these docks on paying the Company a percentage over and above the actual cost of construction.

In any extensive construction in the harbour, in the way of raising the levels to that of the basins of the canal, it will be necessary to look for a larger supply of water for lockage purposes (combined with the water privileges already existing) than the present canal, or the proposed enlargement thereof, can likely supply.

Therefore, for some time yet, at least, it would be undesirable to abandon the idea of raising the levels of the harbour, and adopt a course of improving and extending the present harbour, which may, at a comparatively small cost, be made sufficient to supply the demands of the trade for years to come.

If the shoals outside of the harbour were dredged to a large extent, and this material deposited and formed into a strong bank, sufficiently high to prevent the ice shoving over it, and that to the outside boundary of the harbour, and extend downwards from behind Mill street towards the Victoria Pier, the space thus enclosed, if utilised for shipping purposes, would be sufficiently large for any likely requirements for a long time, while it might be so arranged as not to interfere with, but form part of, any future dock scheme which might be found desirable and necessary.

This bank, wharf or guard wall, was suggested to the harbour authorities in 1846 by John Cliff, C.E., and submitted for their consideration, on a plan bearing that

date, showing this wharf, or guard wall, in a modified form, extending downwards from Windmill Point, and combining some recommendations for harbour extension.

Such a construction would make the present harbour a place of safety for the shipping during the winter, and supply that want, which every year becomes more apparent. The large space thus enclosed can be laid out to great advantage, affording great opportunity for the location of the several branches of trade, such as coal, iron, grain, &c., &c., while the lumber trade can find ample space below the Victoria Pier, and towards Hochelaga. I would, however, suggest that a large part of the grain trade could be done at this outside wall, when the rails can be brought down from Point St. Charles, and where grain elevators could be erected and protected by the guard wall from the ice. In this way the ocean vessel can be brought alongside of the elevator, which may receive its supplies either by rail or water.

At present there is entirely too little space between the revetment wall and the wharves to admit of proper railway and wharfage space, and by this proposal there will be sufficient space to remove the revetment wall outward, as well as to extend the present wharves into the harbour to give ample space for all kind of railway and cartage facilities.

Some of these views I have frequently submitted to the Harbour Commissioners, with plans for an elevator and grain store on the present harbour—in times past when I was the Harbour Engineer.

In reply to Mr. Bell,

Mr. Forsyth said :—I do not think it would be any advantage to have to raise vessels from the present level of the harbour, but would be much better to construct the wharves on the present plan, with, probably, a little additional height.

I do not think it would be any advantage to make a small dock, unless it might be to make it available as a dry dock for the use of the largest class of ships which come into the harbour, and this could be connected by a pipe from the level of the second lock of the canal, and drained into the harbour, giving a height at low water equal to a lift of 26½ feet.

Mr. Bell—You consider the present system of low water wharves better than to raise the water in the basins and enter by locks?

Mr. Forsyth—In the present circumstances of the harbour, and the facilities for its increase on the present levels, I consider it better to make the necessary improvement on the present levels, and avoid, as far as possible, the necessity of locking up. The present proposed extensions of the canal accomodation will meet these dockage requirements when they may be desirable.

Mr. Bell—Then for railway accomodation, suppose Point St. Charles was made into a floating dock, and basins, and wharves put into them, do you think it would be an advantage?

Mr. Forsyth—It would make additional accomodation, but at a fabulous cost and might as well be left for future generations to construct, while, by the improve-

ments suggested in the present harbour, the railway accommodation necessary can be had for grain, coal, iron, &c. &c., on the outside bank or guard wall and wharves. On the inside thereof—and the city traffic thereto not being very great—draw-bridges over the canal would suit every purpose for general communication, while the present railway communications with the harbour can be extended *ad libitum*, by widening out the revetment wall and the wharves in front of it, as far as may be found requisite.

Mr. Bell—You consider that to build wharves here, without having direct communication with the present quays, would not be an advantage?

Mr. Forsyth - Wharves so constructed might have some advantages, but the approach to them, without direct communication, would be excessively inconvenient.

Mr. Bell—But if you could put out wharves there, and connect them by draw-bridges, do you think that would be a good plan?

Mr. Forsyth—If the Government would give sufficient draw-bridge facilities over the canal, those wharves would be more convenient than if not so connected.

Mr. Bell—But I mean in the present harbour?

Mr. Forsyth—Draw-bridges in the harbour, if not protected from the ice by a guard wall, as suggested, and also if not raised above the winter level of the water, would not, in my opinion, be suitable or convenient, as they would require to be removed every fall. But by adopting what has been usually termed the *Outside Channel* for canal purposes, and that of the business to be done along the *guard wall*, in grain, coal, iron, &c., the whole of the remaining space inside, and the shoals, could be wharfed over and connected with the present harbour without the aid of draw-bridges, and the increased accommodation would enable all the general trade to be done in the upper part of the harbour, in which position almost every merchant has hitherto expected he should have his vessel placed (or, as it has been put by the late Harbour Engineer, Mr. Nish, "*Under the shadow of the Custom House*"); while there has been ample space for a large amount of trade at the new and commodious wharves from the Victoria Pier to Hochelaga.

By the present plans of the Government for the enlargement of the Lachine Canal, a large amount of wharfage will be available for sea-going vessels up to a draft of 19 feet of water, and which will naturally diminish the present water of the harbour, and afford the means of bringing the ocean and inland vessels alongside each other, while, in connection therewith, additional dry-dock accommodation can be afforded to a depth of 19 feet.

In view of this canal extension, it is highly desirable that the Government should cause the St. Gabriel Locks to be constructed to 19 feet on the mitre sill, and thus make available, for that depth of water, the already extensive dry docks of the Canada Marine Works of A. Contin, Esq., situate immediately above the St. Gabriel Lock, besides using up all that extensive reach, from the St. Gabriel to the Cote St. Paul Lock, for ocean vessels.

It would be advisable, however, in connection with the proposed extension of the harbour, to have a dry dock of sufficient capacity to admit the largest vessel which could come up the St. Lawrence, as circumstances might occur which would preclude the possibility of her being taken to Quebec to the new dry docks to be constructed there.

In connection with the enlargement of the harbour, there is a matter which, in a sanitary point of view, is deserving of special attention, viz., the drainage of the city, which is, in many cases, discharged into the harbour, and, in view of the outside current being cut off by the proposed extension, this subject cannot be too strongly urged upon the attention of the Harbour Commissioners.

In some instances these drains not only rapidly fill up the harbour, particularly so in regard to that drain which is discharged into the Elgin Basin, but the poisonous gases therefrom are particularly dangerous to the locality, while many others are so to a less degree.

In the late constructions in the harbour, these drains have generally been made to discharge below low water mark, still, in many cases, the dangerous gases permeate through the wharf-work, poisoning the atmosphere around.

In the event of the revetment wall being extended, I would suggest that, at the same time, a large drain or tunnel be constructed from about Prince Street, along Common and Commissioner Street, and down the river front as far as Colborne Avenue, intercepting all the drains which now discharge into the harbour, and at that point to connect with the Colborne Avenue tunnel, which ought to be extended into the river, until the rapid current will pass across the outer end, and carry away all the drainage as it is thus discharged. The upper end of this tunnel I would connect with the canal, so as to have, at all times, ample water to flush it out as often as might be found desirable or necessary.

In addition to the foregoing, Mr. Forsyth promised to give the Board of Engineers some account of the construction of the harbour in the past, but he regrets now he is unable to redeem that promise, from the fact, that just as his engagement as Harbour Engineer was about to terminate, the Harbour Commissioners took possession of all his private notes on harbour construction, (although they were carefully preserved in books which were strictly private property) and claimed that as these were made while he was in the employ of the Commissioners, they were, therefore, their property,—but, if from recollection, this may be still within his reach, and he can redeem that promise, he will be very happy to do so.

TWELF . . . DAY'S PROCEEDINGS.

The Board again met on November 4th, at Ten o'clock, when evidence was resumed by the examination of

SIR HUGH ALLAN, of the "Allan" Line of Steamers.

Mr. Bell—The object we had, Sir Hugh, in asking you to meet us was to obtain from you your views regarding the harbour, both as to the accommodation it at present affords, and what, in your opinion, is necessary to meet the growing increase of the port?

Sir Hugh Allan—What is really wanted is wide space between the water and the revetment wall, so as to give space for railways, for which there is no convenient room at present. With this object, it is necessary to widen the quay to a great extent. In order to do that, it will be necessary to take away part of the bank (shoal) outside, because if you carry the quay face out without widening the bank, you will narrow the width of the channel. Then you can build a wharf from near Windmill Point, so as to allow the rails to be laid down, and take cargoes going to the west. It would be an advantage to the city and trade to take cargoes from the wharf without carrying them through the city. The cargoes could be put into the railway cars there (place indicated), which would save cartage. It would be an advantage to the harbour in several ways, if this was done. Then, I think, the entrance to the canal, which is at present but a waste weir, should be utilised by being made into a lock for all canal craft to go through and pass down on the outside, along the wharf that is being constructed in front of Windmill Street, without going into the harbour proper. They could then go out to sea without encumbering the harbour or locks, which are, at present, so much occupied, that two or three hours in summer are lost before vessels can go up or down. To utilise the space this gives you, by making the most of it, and getting the most accommodation possible from it, is all that can be done at present. There is no doubt the valuable part of the harbour is from the point at the Long Wharf up to the canal locks. That part ought to be utilised as much as possible.

Mr. Bell—Will you be kind enough to give us your views about storage, about grain stores?

Sir Hugh Allan—That involves the question of building stores on the wharves,

to do which you will have to raise them above the level of the floods, and that involves the question of expense and locking, and I do not think we can have locks in the harbour. I think the number of vessels going out and coming in is so great and continuous, that it would be impossible to get them out by locking. I am clearly of that opinion; therefore, if you want to have storage for grain, or anything of that kind, you will have to raise the wharves, and build stores at the foot of the current, and I am not prepared to say now that grain will be better down below than above. You could easily carry out a wall far enough, at the Hochelaga end of the harbour, without much expense. The channel runs close to the shore.

Mr. Bell—How would that be affected by the ice?

Sir Hugh Allan—Not at all, I think. The ice runs down there (place indicated). The wharf that was built down there has never been pulled up by the ice. Stores might be built here for the accommodation of grain. I think it is the only place where it could be done in the harbour, and without any system of raising the wharves above the water level.

Mr. Bell—Suppose that stores were built upon the present quays, by raising them upon pillars above the reach of the flood, and use the quay space below for the same purposes as it is at present used, would that serve any useful purposes?

Sir Hugh Allan—I am rather at a loss to say how that would be. In winter time, the stores could not be of use, because vessels could not get into the harbour; they could only be used in summer. It would, therefore, be going to a great expense to do what is already attained up on the canal, by the elevators. There are a number of elevators there which answer the purpose—some six or seven. The grain does not suffer any from being moved in that way; because the air is passed through it, which tends to materially benefit it. Of course, there is expense, but I am not sure but what the expense would be as great were you to build such stores as you mention. I think it would be cheaper and more easily attained, by using the present grain stores and elevators; and afford vessels facilities for getting alongside. It would, in the end, be cheaper than building stores on the wharves, or down at Hochelaga. Hochelaga is the only place where you could build them, so as to spout grain direct to the ships.

Mr. Bell—You think the present area of the harbour should be kept for open quayage and sheds?

Sir Hugh Allan—I do.

Mr. Bell—Do you think the quays should be raised?

Sir Hugh Allan—No, I do not. The quays, during late years, were raised one-and-a-half to, I think, two feet higher than they originally were; and I think that is high enough, because, when the water gets low in summer, if the wharves were made higher, it would become inconvenient.

Mr. Bell—I suppose you would consider the height for the quay, about the level of your main deck, when loaded?

Sir Hugh Allan—Yes, sir; just about that. It would not do any harm if they were higher; but the advantage would not justify their being raised, just now.

Mr. Bell—There was a matter brought to our attention by Mr. Forsyth; that he was afraid if the quays were raised higher, the water would freeze on the top of them, and, in the event of a sudden flood coming, the ice not having time to rot, would lift and destroy the pier.

Sir Hugh Allan—Well, I don't know about that; but, at the same time, I am not in favor of raising the quays too high, unless you are going to raise the whole of the quays up to the level of the highest, then, I say, raise them two feet above that level.

Mr. Bell—Do you consider it more desirable to improve the present harbour area; or to form new docks in some other part altogether, and transfer the whole of the trade to the new docks?

Sir Hugh Allan—I think you should utilise the present harbour. I would not be in favour of moving, because interests have been built up in the present harbour which would be injured by the move; and I don't think any advantage to be gained would be compensative.

Mr. Bell—From your observation of the ice, do you think it would be an advantage to build a high wall along the line of the channel, inclosing the present harbour, from the abutment of the Victoria Bridge to the Victoria Pier?

Sir Hugh Allan—It is just a question of building it high enough; if you build it high enough, it would prevent the ice getting in upon the quays. The tendency of the wall would be to throw the pressure of the ice on St. Helen's Island. It would be desirable, for, if the wall was high enough, ships could winter inside all the season in safety.

Mr.—Bell—If a wall was built as I have indicated, and piers put out from the shore somewhere above the Custom House, and quays carried down parallel with the shore, do you think it would be a good means of accommodation?

Sir Hugh Allan—I do.

Mr. Bell—Would you consider it necessary to hold the present quays intact, whilst carrying out any improvement?

Sir Hugh Allan—Yes; you could not take away these.

Mr. Bell—Why not?

Sir Hugh Allan—The present harbour would be completely ruined.

Mr. Bell—Do you not think it would be advisable to make floating docks at Point St. Charles?

Sir Hugh Allan—I think this plan to deepen the waste weir, and make a lock from the canal into this Basin, in front of Mill street, would be better. The objection to the Point St. Charles docks is that the distance is so great, and the time occupied so much in making all these points. The crossing of the railways and the canal would occupy so much time that it would, in my opinion, become useless. The object that

could be attained by doing it could be served by the lockage to the canal and the railway on the outer wharf.

Mr. Bell—Supposing St. Etienne street was improved, and the railway carried either over or under the street, and a tunnel made under the canal, so as to give uninterrupted access, would there not be trade sufficient for a dock in this position?

Sir Hugh Allan—I don't think so. I don't know of any trade that wants it, and I don't know any trade that will be benefited by it. The expense, trouble and time by going round there would be altogether lost.

Mr. Bell—Suppose that the present quays have been improved and extended, and the extra accommodation has been all taken up from the increase of the trade, where would you go next?

Sir Hugh Allan—I propose to go below; if you have your wharves here wide enough to admit of railways running up the bank, it would be all that is required.

Mr. Bell—You would utilise these shoals, below Hochelaga, by turning them into docks.

Sir Hugh Allan—Yes, Sir. You see the greatest part of the town is between these two points, McGill Street and Commissioners Wharf.

Mr. Bell—Suppose that grain became such a great trade that they took to storing it?

Sir Hugh Allan—That never will be.

Mr. Bell—And elevating out of canal boats into stores, and spouting it, when required, into the sea-going vessels, which have no general cargoes for the city, would that not be a useful place for stores?

Sir Hugh Allan—No, I think not, because at Point St. Charles you have two entrances for grain,—the railway brings grain and the water brings grain. To the railway carried grain it might be a benefit, but not to the water. No person will put grain into store, unless they have special reasons for doing so, whilst they can go alongside the ship, and thereby save storage.

Mr. Bell—But if it comes by rail it has to go into store?

Sir Hugh Allan—Yes, sir.

Mr. Bell—So that Point St. Charles would only be of use for purely railway carried grain?

Sir Hugh Allan—Yes; and then this siding of the railway was built for the very purpose of providing accommodation for the stores on the canal bank. You have the St. Paul's elevator, and you have five or six other elevators here. I don't think the trade is likely to increase. Montreal is not the place to keep grain in storage; it is a place for transshipment. Then, with regard to railways, there is another question. You can have stores alongside the ship at Hochelaga; your railway comes down here and elevates it into the ship, without any of this extra wharfage at all.

Mr. Bell—You said something about the deposit of the dredgings?

Sir Hugh Allan—Yes. I think there has been an error made, for the last ten

years, in depositing the dredged matter there (Ile Verte), and I have not the least doubt it has filled up the channel to a certain extent.

Mr. Bell—Is there any other point or place near the harbour where you consider improvements might be made ?

Sir Hugh Allan—No ; the only way is to make the most of these series of shoals. Hochelaga might be used for lumber and grain stores, and, to a great extent, for vessels coming out for a load of grain. The easiest way for ships, is for them to go alongside a store, and have it spouted into them.

Mr. Bell—The current in the river opposite Ile Ronde is caused by the contraction of the river ?

Sir Hugh Allan—Yes.

Mr. Bell—Do you think it would affect the current, at all, to take a corner off Ile Ronde ?

Sir Hugh Allan—Undoubtedly it would ; but the expense would be too great.

In answer to Mr. Bell,

Sir Hugh Allan said he had not the least hesitation in saying that there ought to be a line fixed, inside which all stuff taken by dredging should be deposited.

Mr. Bell—What would you do with the space at Point St. Charles ?

Sir Hugh Allan—I would let it remain as it is until you have gone on with the works you have in view, then see what can be done with it.

Mr. Bell—So you think it should be reserved for harbour purposes ?

Sir Hugh Allan—Undoubtedly, because we don't know what use we may require to make of it. I think it will be used as a railway terminus.

Mr. Bell—Would you not be inclined to reserve it for a series of basins, the same as the one in front of Mill Street ?

Sir Hugh Allan—It might be ; I would undoubtedly reserve it for harbour purposes. I don't think it will be required for harbour, but I think it will be for railway purposes. In connection with the harbour, I highly approve of the plan of a high wall, to prevent the ice from shoving into the harbour, and I approve of the plan for an open entrance of five hundred feet, for all vessels to come in. With the extra wharfage you can give us, I think it will do for all time. When all this is filled up, then you go down here (Hochelaga). The whole thing depends upon the facilities you give to railways to come down to the quays.

Mr. JOHN TORRANCE, of the Dominion Line of Steamships.

I think the harbour is unquestionably too small : I think it is very desirable that any increase in the harbour should be made, as far as possible, in the vicinity of the present harbour, that is, between Victoria pier and the canal.

Mr. Bell.—How are you situated at present ?

Mr. Torrance.—We have plenty of room ourselves at present.

Mr. Bell.—But if trade increases, and there was great competition for room ?

Mr. Torrance.—I consider we have the best berth in the harbour just now, and we are satisfied with it.

Mr. Bell.—Suppose it was desired to give greater accommodation, where do you consider it best to shift the steamers to ?

Mr. Torrance.—I think the steamers might be shifted down to Commissioners' wharf without any danger at all ; I think 2,000 feet will be sufficient to accommodate all.

Mr. Bell.—There is 3 000 feet there ?

Mr. Torrance.—Well, then, there is plenty of room for all lines of steamers for ten years to come ; and I consider it is unquestionably the best part of the harbour for them ; it reaches between Military Basin and Monarque wharf ; there is considerable difficulty, sometimes, in bringing large vessels here, which would be avoided.

Mr. Bell.—Would there be any difficulty there in turning ?

Mr. Torrance.—No, sir ; we laid there for one year, and had no difficulty at all ; but, of course, if you occupied the whole space with ocean steamers there, it would have to be dredged.

Mr. Bell.—You consider, if the river was dredged from Military Basin to Monarque Street Wharf, and proper quays put out, that it would be a good place for ocean vessels ?

Mr. Torrance.—Yes ; it is the best in the harbour.

Mr. Bell.—You consider this situation the most convenient ?

Mr. Torrance.—Decidedly ; what I mean is, that all steamers be put there ; then each line would be on one footing ?

Mr. Bell.—What I understand from you is, that with regard to the trade of the city, the present situation is the best ; but that the situation between Military Basin and Monarque Wharf would be more suitable for the steamers themselves ?

Mr. Torrance—Yes, sir; they are increasing the size of these steamers so enormously, that we must have room.

Mr. Bell—At present the steamers come right up the river, and to these quays?

Mr. Torrance—Yes, sir.

In answer to a question, Mr. Torrance said:—It is best to turn the steamer before loading.

Mr. Bell—Have you sufficient breadth of water for turning?

Mr. Torrance—Barely sufficient—that is, at the Merchants' Wharf; we discharge at quays which are about 7 or 10 feet above summer water level.

Mr. Bell—Then, if a basin was made here, would it be better to enter right off the river, or to be locked up to the level of the canal?

Mr. Torrance—I should think it better to enter from the river—that is, simply for convenience sake.

Mr. Bell—Do you consider it would be necessary to put storehouses or granaries upon the quays for the trade that you carry on?

Mr. Torrance—I think not; most of the grain comes down in barges, and is transferred into the vessels.

Mr. Bell—But suppose the merchants were to store their grain?

Mr. Torrance—In that case it would be decidedly advantageous to have stores; if you are going to make Montreal the *entrepot* for the grain trade of the West, let us have storehouses; but then there is another question to look at,—the question of expense. If you transfer the grain direct from the barges into steamboats, you save a great deal of expense. The great thing for us to do here is to try to make things work as economically as possible; and getting the harbour sufficiently deep to accommodate the largest sea going ships.

Mr. Bell—Suppose the basin was filled, (with trade) and the river quays all taken up as far down as Hochelaga, where would be the next place to go for improvements?

Mr. Torrance—Point St. Charles.

Mr. Bell—Would wet locks or river basins be best?

Mr. Torrance—Wet docks. I believe there is room at Point St. Charles for great extension.

Mr. Bell—What breadth of quay would you think proper for vessels to be accommodated at both sides?

Mr. Torrance—I should think 200 feet plenty; though 100 feet is little enough for a large steamer. There are special trades accommodated here,—vessels carrying lumber and fish; if this special trade were accommodated with special berths the room might be economised.

Mr. Bell—Where would you put the lumber trade?

Mr. Torrance—I think it might go down below, as far as you like.

Mr. Bell—Where would you put the coal trade?

Mr. Torrance—It should go up in the vicinity of the railway.

Mr. Bell—If the present steamboat accommodation was improved, you could accommodate firewood and lumber below Military Basin?

Mr. Torrance—Yes, sir; if a system of basins and piers was carried out parallel with the present shore, giving nearly double the present accommodation, I should think it would be sufficient for a long time. Whatever is done in the improvement of the present steamboat quays, it should be kept in view to throw out a breast-wall so as to have a wide space of quayage; I consider *that* all important. Another important thing to keep in view, in any works that are proposed, is the large size of vessels, and the large size they will eventually be built. I think it unquestionable that the larger your ship is, the cheaper you can carry your cargo.

Mr. Bell—You consider, whether anything is done at Point St. Charles or not, it ought to be reserved for harbour purposes?

Mr. Torrance—Yes, sir; decidedly.

CAPTAIN THERLE, of the Steamship "Quebec," (Dominion Line) being present during the hearing of Mr. Torrance's testimony, concurred in everything that he said.

In addition to the foregoing evidence, the Board have received plans and descriptions for proposed Harbour improvements, by Messrs. Springle & Forbes, and Mr. Joseph Smith; but both of these plans are mainly devised to give increased accommodation on the opposite side of the harbour from the town, whereas the first necessity is to improve and increase the present quays and harbour system. They both entail a very heavy expense in changing the present straight channel into a circuitous one, and we cannot see that it will effect the objects which the Commis-

sioners have in view, as the principal accommodation which they provide is cut off from the town. It is true that Mr. Springle's plan proposes to give accommodation, connected with the town, by forming a large embankment on a shoal, which, no doubt, would give greater accommodation; but this is to be effected by throwing aside and entirely altering works which the Government have not only decided to carry out, but have got in a fair state of advancement, and which it is not at all likely they will give their consent to. It also contemplates putting down very heavy works in the way of breakwaters, carried down in the most rapid part of the current, which, being simply islands, will be entirely useless as quays, and will, besides, curtail the water channel in the part of the course of the river, which is already too narrow.

Mr. Smith's plan is entirely confined to accommodation on the side opposite to the town, by quays which have no proper means of access to the streets, and leaves the present Harbour without any improvement whatever.

RETURNS OF REVENUE AND EXPENDITURE, FURNISHED BY THE
SECRETARY TO THE HARBOUR COMMISSIONERS.

Statement showing the Revenue, Expenditure and Surplus, from 1864 to 1874.

YEAR.	REVENUE.	EXPENDITURE.	SURPLUS.
1864.....	\$105,326	\$ 76,157	\$ 29,169
1865.....	56,830	79,332	17,498
1866.....	129,103	86,446	42,657
1867.....	123,575	93,447	30,128
1868.....	117,272	87,878	29,394
1869.....	136,841	90,338	46,503
1870.....	170,618	89,012	81,606
1871.....	193,691	99,406	91,285
1872.....	225,717	106,912	118,805
1873.....	248,885	125,470	123,415
1874.....	280,021	127,468	152,553

Revenue and Expenditure of the Harbour of Montreal, from 1864 to 1874.

REVENUE.		EXPENDITURE.	
—1864.—		<i>Ordinary Harbour Expenditure.</i>	
Wharfage Inwards.....	\$ 39,007	Interest on Debt.....	\$ 62,296
Champlain Railway Co. and other sources.....	1,001	Harbour Repairs.....	5,038
Sailing Vessels and Steamers, and their cargoes—outwards.....	24,601	General Management—including Salaries, etc.....	8,823
Local Traffic.....	39,857		\$76,157
Rent of Offices.....	860	Surplus Revenue.....	29,169
	\$105,326		\$105,326
—1865.—		<i>Ordinary Harbour Expenditure.</i>	
Wharfage Inwards.....	\$ 31,583	Interest on Debt.....	\$ 64,512
Sailing Vessels and Steamers, and their cargoes—outwards.....	18,532	Harbour Repairs.....	5,066
Local Traffic.....	42,285	General Management—including Salaries, etc.....	9,754
Longueuil Ferry Wharf.....	2,700		79,332
Rents.....	1,639	Surplus Revenue.....	17,498
Fines, etc.....	91		\$ 96,830
	\$ 96,830		\$ 96,830

—1866.—

REVENUE.		EXPENDITURE.	
		<i>Ordinary Harbour Expenditure.</i>	
Wharfage Inwards.....	\$50,330	Interest on Debt.....	\$71,344
Sailing Vessels and Steamers and their Cargoes outwards.....	35,172	Harbour Repairs.....	5,356
Grand Trunk Railway.....	2,000	General Management, including Salaries.....	9,746
Local Traffic.....	39,668		<u>\$86,446</u>
Rents.....	1,781	Surplus.....	42,657
Sundries.....	152		<u>\$129,103</u>
	<u>\$129,103</u>		

—1867.—

REVENUE.		EXPENDITURE.	
		<i>Ordinary Harbour Expenditure.</i>	
Wharfage Inwards.....	\$ 47,760	Interest on Debt.....	\$75,057
Sailing Vessels and Steamers and their Cargoes outwards.....	31,745	Harbour Repairs.....	9,214
Grand Trunk Railway.....	2,709	General Management, including Salaries.....	9,176
Rents, etc.....	1,920		<u>\$93,447</u>
Sundries.....	2	Surplus.....	30,128
Local Traffic.....	39,877		<u>\$123,575</u>
	<u>\$123,575</u>		

—1868.—

REVENUE.		EXPENDITURE.	
		<i>Ordinary Harbour Expenditure.</i>	
Wharfage Inwards.....	\$ 41,451	Interest on Debt.....	\$ 72,917
Sailing Vessels and Steamers, and their cargoes—outwards.....	29,603	Harbour Repairs.....	5,685
Grand Trunk Railway.....	3,011	General Management—including Salaries, etc.....	9,276
Local Traffic.....	42,301		<u>\$87,878</u>
Rents, etc.....	885	Surplus.....	29,394
Sundries.....	21		<u>\$117,272</u>
	<u>\$117,272</u>		

—1869.—

REVENUE.		EXPENDITURE.	
		<i>Ordinary Harbour Expenditure.</i>	
Wharfage Inwards.....	\$ 45,905	Interest on Debt.....	\$ 72,362
Sailing Vessels and Steamers, and their cargoes—outwards.....	45,527	Harbour Repairs.....	8,483
Grand Trunk Railway.....	2,812	General Management—including Salaries, etc.....	9,493
Local Traffic.....	41,781		<u>\$ 90,338</u>
Rents, etc.....	815	Surplus.....	46,503
Sundries.....	1		<u>\$136,841</u>
	<u>\$136,841</u>		

—1870.—

REVENUE.		EXPENDITURE.	
Wharfage Inwards.....	\$64,527	<i>Ordinary Harbour Expenditure</i>	
Sailing Vessels and Steamers and their Cargoes outwards.....	56,930	Interest on Debt.....	\$70,810
Grand Trunk Railway.....	2,810	Harbour Repairs.....	8,303
Rents.....	831	General Management, including Salaries.....	9,899
Sundries.....	1		
Local Traffic.....	45,519	Surplus.....	\$89,012
			81,606
	<u>\$170,618</u>		<u>\$170,618</u>

—1871.—

REVENUE.		EXPENDITURE.	
Wharfage Inwards.....	\$78,661	<i>Ordinary Harbour Expenditure.</i>	
Sailing Vessels and Steamers and their Cargoes outwards.....	65,989	Interest on Debt.....	\$70,113
Grand Trunk Railway.....	3,500	Harbour Repairs.....	10,178
Local Traffic.....	46,588	New Boiler for Tug.....	1,507
		Hull for Spoon Dredge.....	4,046
		Special for services.....	1,967
		General Management, including Salaries.....	12,495
Less Wharfage returned.....	1,047	Surplus.....	\$99,406
	<u>\$194,738</u>		94,285
			<u>\$193,691</u>
	<u>\$193,691</u>		

NEW WORKS IN HARBOUR.

Harbour Dredging.....	\$34,405
Wharves and Basins.....	25,991
	<u>\$60,396</u>

—1872.—

REVENUE.		EXPENDITURE.	
Wharfage Inwards.....	\$ 93,109	<i>Ordinary Harbour Expenditure.</i>	
Sailing Vessels and Steamers and their cargoes—outwards.....	78,214	Interest on Debt.....	\$ 75,469
Grand Trunk Railway.....	3,500	Harbour Repairs.....	18,668
Local Traffic.....	51,262	General Management—including Salaries, etc.....	12,775
		Surplus.....	\$106,912
Less wharfage returned.....	368		118,805
	<u>\$226,085</u>		<u>\$225,717</u>
	<u>\$225,717</u>		

NEW WORKS IN HARBOUR.

Harbour Dredging.....	\$ 55,372
New Plant.....	36,957
Chain Tug.....	20,634
Wharves and Works.....	50,919
	<u>\$163,882</u>

—1873.—

REVENUE.	EXPENDITURE.
	<i>Ordinary Harbour Expenditure.</i>
Wharfage—Inwards	Interest on Debt
\$ 86,782	\$ 78,411
Sailing Vessels and Steamers, and their cargoes—outwards	Harbour Repairs
102,719	13,916
Grand Trunk Railway	General Management—including Salaries, etc.
4,000	15,400
Local Traffic	Coals
55,733	17,743
	<hr/>
	\$125,470
\$249,234	Surplus
Less wharfage returned	123,415
349	<hr/>
\$248,885	\$248,885

NEW WORKS IN HARBOUR.

Harbour Dredging	\$ 75,991
Chain Tug	5,099
New Dredging Plant, Scows, Spoon Dredge, Barges	64,824
Wharves and Extensions	74,044
Buoys and Beacons	3,517
	<hr/>
	\$223,475

—1874.—

REVENUE.	EXPENDITURE.
	<i>Ordinary Harbour Expenditure.</i>
Wharfage Inwards	Interest on Debt
\$95,972	\$91,544
Sailing Vessels and Steamers and their Cargoes outwards	Harbour Repairs
106,788	12,981
Harbour Dues on through Goods for the Province of Ontario	General Management and Ex- penses, including Survey
14,417	22,943
Local Traffic	
63,265	
	<hr/>
\$280,442	Surplus
Less Wharfage Returned	152,553
421	<hr/>
\$280,021	\$280,021

NEW WORKS IN HARBOUR.

Harbour Dredging	\$86,813
Floating Plant, &c.	61,352
Wharves and Works	89,021
	<hr/>
	\$237,186

NEW WORKS IN RIVER.

Floating Plant, &c.	\$440,115
New Channel Excavation	36,206
	<hr/>
	\$476,321

TABLES OF IMPORTS AND EXPORTS OF WHEAT, NUMBER AND TON-
NAGE OF VESSELS, AND DEPTH OF WATER IN THE HARBOUR,
FURNISHED BY THE SECRETARY TO THE BOARD OF TRADE AND
THE HARBOUR MASTER.

*Table showing the averages of Receipts and Shipments of Flour, Wheat and
Corn, at Port of Montreal, in periods of Five Years, from 1846 to 1875.*

YEARS.	FLOUR—Barrels.		WHEAT—Bushels.		CORN—Bushels.	
	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.
1846-50	545,171	269,574	733,191	324,205	29,326	1,144
1851-55	520,014	173,315	628,125	218,144	309,181	40,518
1856-60	597,054	203,463	1,603,184	801,307	216,394	45,847
1861-65	1,020,847	662,722	5,724,858	3,804,228	1,234,651	929,353
1866-70	853,955	757,880	4,021,944	2,862,029	664,120	669,698
1870-75 * . . .	962,453	803,351	7,382,918	6,561,234	3,736,072	3,572,871

* The quantities in 1875 only include to 6th October.

Statement of Averages, in periods of Five Years each, of the Imports and Exports at the Port of Montreal, from its establishment as a Port of Entry in 1832 up to 1867, and annually thereafter up to 1874.

YEARS	IMPORTS.	EXPORTS.
1833-37 }	\$ 3,543,066	\$ 1,154,270
1838-42 }	5,428,263	1,593,711
1843-47 }	8,515,324	2,652,450
1848-52 }	7,835,775	2,053,874
1853-57 }	15,120,321	2,692,086
1858-62 }	16,019,584	6,257,950
1863-67 }	24,301,702	6,730,564
1868.....	22,917,904	10,855,860
1869.....	24,097,648	16,749,210
1870.....	31,524,861	19,027,153
1871.....	35,504,334	24,133,519
1872.....	45,675,016	26,296,743
1873.....	40,714,179	31,072,879
1874.....	43,479,482	.....

*Number and Tonnage of Sea-going Vessels at the Port of Montreal
during Eleven Years, from 1864 to 1874, inclusive.*

YEAR.	NO.	TONNAGE.
1864.....	378	161,901
1865.....	358	152,943
1866.....	516	205,775
1867.....	464	199,053
1868.....	478	198,759
1869.....	557	259,863
1870.....	680	316,846
1871.....	664	351,721
1872.....	727	398,800
1873.....	702	412,478
1874.....	731	423,423

Tonnage of Steamships.

YEAR.	NO.	TONNAGE.
1864.....	51	59,071
1869.....	117	117,965
1872.....	215	217,713
1874.....	266	262,096

COMPARATIVE STATEMENT of the number of days in which undermentioned Canals were open for purposes of navigation, on an average of twenty-five years, from 1850 to 1874.

Lachine Canal.....	219½ days
Welland Canal.....	234 "
Erie Canal	215 "

Greatest Number of Arrivals in Port on any one day.

YEAR.	VESSELS.	DATE.	YEAR.	VESSELS.	DATE.
1861	17	May 26	1869	20	April 25
1862	14	Oct. 11	1870	25	" 18
1863	13	May 24	1871	15	" 8
1864	8	Oct. 19	1872	16	July 20
1865	7	" 25	1873	11	{ April 26 June 21
1866	14	{ April 20 Oct. 8	1874	16	April 25
1867	16	April 22	1875	17	May 5
1868	12	June 21			

PORT OF MONTREAL.

Number and Tonnage of Inland Vessels that arrived in Port the following Years:

YEAR.	No. OF VESSELS.	TONNAGE.	GREATEST NUMBER IN PORT AT ONE TIME.
1861	5,247	530,224	196 on June 10.
1862	4,875	523,991	164 " Nov. 11.
1863	4,697	534,740	197 " June 20.
1864	4,509	420,694	220 " Sept. 6.
1865	4,771	626,550	205 " Sept. 5.
1866	5,083	613,679	240 " Oct. 14.
1867	5,248	744,477	244 " " 31.
1868	5,822	746,927	297 " June 22.
1869	5,866	721,324	259 " Nov. 5.
1870	6,345	819,476	255 " Oct. 6.
1871	6,878	624,787	281 " " 6.
1872	7,150	936,782	309 " " 21.
1873	6,751	933,462	296 " June 8.
1874	6,855	956,837	301 " " 14.

(Signed,)

A. M. RUDOLF,
Harbour Master.

1874.

Depth of Water on Lower Lock Sill of Lachine Canal at Noon.

DAY.	JANY.	FEB'RY.	MARCH	APRIL.	MAY.	JUNE	JULY.	AUG.	SEPT.	OCT'BR.	NOV'BR	DEC'BR.
	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
1	34.8	32.2	30.2	29.6	21.5	24.0	22.0	19.7	17.5	17.0	16.7	16.2
2	34.8	32.0	30.8	29.5	21.5	24.0	22.2	19.7	17.4	17.0	16.6	16.4
3	34.0	31.6	30.8	30.1	21.3	23.10	22.2	19.6	17.5	17.1	16.6	16.4
4	33.6	31.6	30.10	29.5	21.3	23.9	22.0	19.5	17.6	17.1	16.5	16.6
5	32.2	31.3	30.7	29.3	21.0	23.8	21.11	19.3	17.4	17.0	16.5	16.5
6	32.10	30.3	30.4	30.3	20.9	23.8	21.9	19.1	17.3	17.0	16.6	16.5
7	33.6	30.0	31.3	29.9	20.5	23.7	21.7	19.0	17.4	17.0	16.7	16.6
8	34.0	30.0	31.5	29.7	20.3	23.5	21.6	18.10	17.3	16.11	16.6	16.5
9	33.9	30.4	31.7	29.5	20.2	23.5	21.5	18.8	17.4	16.10	16.5	16.3
10	34.3	31.3	31.0	29.5	20.3	23.7	21.3	18.7	17.5	16.10	16.7	16.3
11	33.10	31.3	30.9	29.3	20.3	23.6	21.1	18.6	17.5	16.11	16.6	16.2
12	33.1	31.0	30.6	28.9	20.10	23.5	20.10	18.5	17.4	17.1	16.6	16.3
13	33.6	31.0	29.3	28.10	20.8	23.1	20.9	18.5	17.2	17.1	16.5	16.5
14	33.8	31.10	28.9	28.10	21.0	23.0	20.7	18.6	17.2	17.0	16.4	16.5
15	34.6	32.0	29.0	29.3	21.3	23.0	20.5	18.6	17.0	17.0	16.2	16.5
16	34.6	32.2	29.3	29.8	21.5	23.0	20.5	18.5	17.2	16.10	16.2	16.8
17	33.6	32.0	29.10	30.1	22.0	23.1	20.5	18.3	17.6	16.10	16.3	21.3
18	33.10	31.10	30.0	30.0	22.5	23.2	20.3	18.1	17.4	16.11	16.3	23.3
19	34.5	31.6	30.3	30.3	23.0	23.2	20.1	18.0	17.3	16.10	16.2	24.1
20	34.2	31.0	30.6	33.0	23.5	23.3	20.0	18.0	17.3	16.9	16.2	28.7
21	33.6	31.0	31.0	31.9	24.0	23.3	20.0	18.1	17.2	16.7	16.3	25.1
22	32.11	30.10	31.6	29.8	24.2	23.2	19.11	18.0	17.1	16.6	16.4	27.3
23	34.2	30.9	31.3	25.5	24.4	23.1	19.9	17.10	17.0	16.6	16.5	29.10
24	34.0	30.5	30.9	25.10	24.6	23.1	19.7	18.0	17.0	16.6	16.5	28.9
25	33.6	29.9	30.9	25.0	24.6	23.0	19.5	17.10	17.0	16.5	16.7	27.7
26	33.0	30.6	31.3	24.9	24.4	23.0	19.5	17.9	17.0	16.5	16.7	27.7
27	32.10	30.0	31.0	23.6	24.4	22.10	19.4	17.9	17.0	16.6	16.5	27.8
28	32.8	29.8	31.0	23.0	24.3	22.6	19.6	17.8	17.1	16.7	16.3	28.7
29	32.5	.....	30.9	22.10	24.3	22.4	19.6	17.7	17.0	16.7	16.4	28.2
30	32.5	.....	30.5	22.0	24.0	22.0	19.5	17.5	17.0	16.6	16.2	29.7
31	32.4	30.3	23.11	19.7	17.5	16.6	29.1

(Signed)

A. M. RUDOLF,
Harbour Master.

Noon.

ft. in.	DEC'BR.
16.2	
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Master.

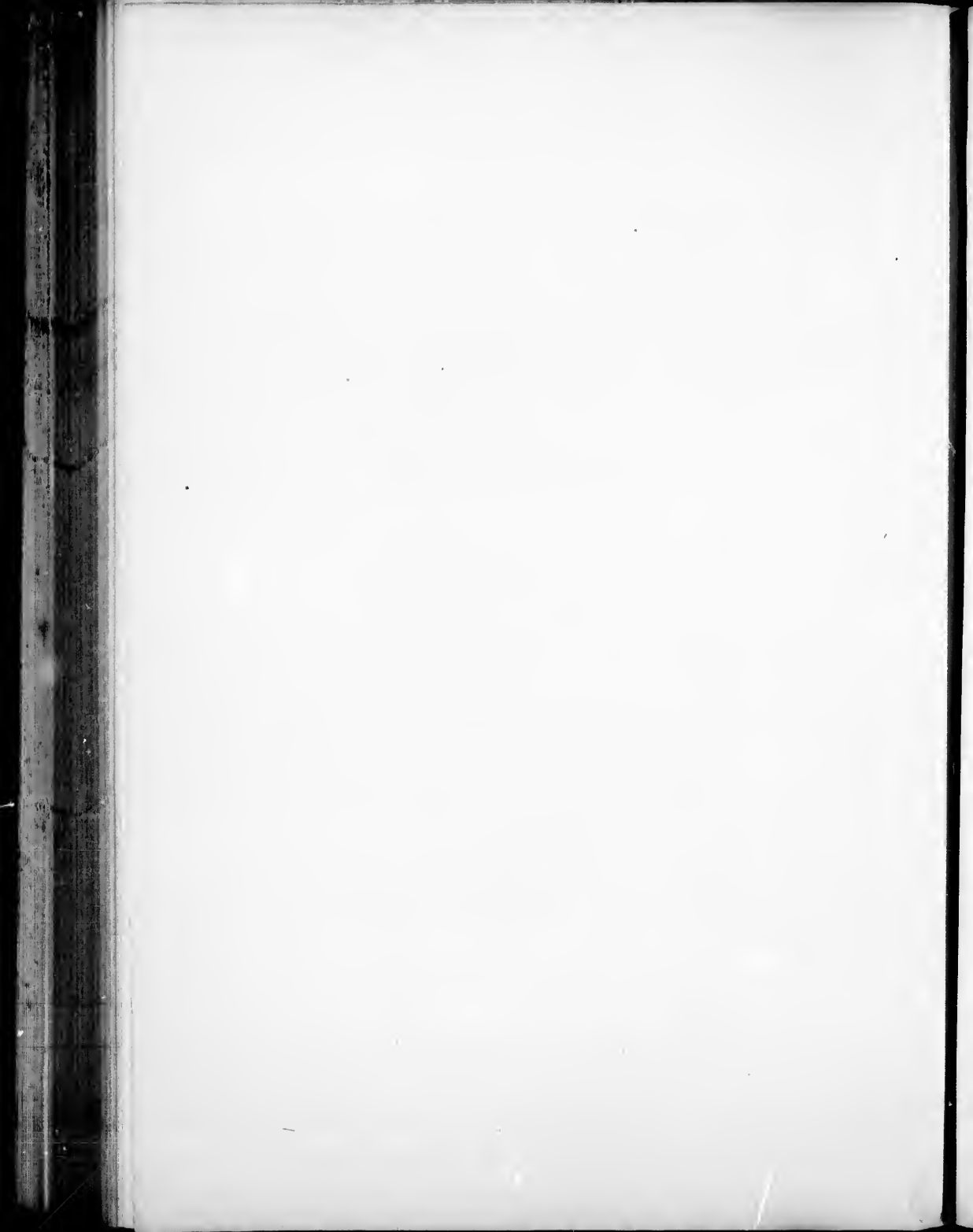
PORT OF MONTREAL.

—:—:—

Comparative Statement, showing the dates of the Opening and Closing of Navigation, First Arrival from Sea, Last Departure for Sea, Number and Tonnage, &c., of Sea-going Vessels for the following years:—

Year	Opening of Navigation.	Close of Navigation.	First Vessel from Sea.	Last Vessel for Sea.	No. of Steamships.	Tonnage	No. of Sail.	Tonnage.	Total Vessels	Total Tonnage.	Greatest Number in Port at one time.
1854	April 25	Dec. 6	May 20	Nov. 23	6	5,545	252	65,365	258	70,910	21 on Oct. 16
1855	" 28	" 12	" 19	" 20	6	5,545	197	48,454	197	48,154	30 " June 14
1856	" 24	" 3	April 30	" 24	16	14,276	231	57,045	247	71,321	26 " " 9
1857	" 18	" 13	May 1	" 25	9	7,541	218	60,199	227	67,740	26 " " 13
1858	" 9	" 12	April 30	" 24	16	17,887	209	60,922	225	78,809	22 " " 5
1859	" 4	" 11	May 3	" 20	35	43,704	195	50,956	230	94,660	23 " " 3
1860	" 10	" 7	April 30	" 25	37	45,385	222	76,174	259	121,559	35 " Oct. 7
1861	" 24	" 22	" 27	Dec. 4	40	51,298	534	210,495	574	261,793	117 " June 6
1862	" 23	" 7	" 28	Nov. 27	53	62,912	518	202,331	571	265,243	78 " Oct. 16
1863	" 25	" 12	May 6	" 26	54	56,460	450	152,764	504	209,224	86 " June 13
1864	" 13	" 11	April 28	Dec. 7	51	59,071	327	102,830	378	161,901	32 " " 23
1865	" 10	" 16	May 3	Nov. 24	63	78,015	295	74,928	358	152,943	42 " Oct. 19
1866	" 19	" 15	" 1	" 28	70	75,474	446	130,301	516	205,775	91 " June 13
1867	" 22	" 6	" 4	" 29	106	87,199	358	111,854	464	199,053	59 " Oct. 24
1868	" 17	" 9	" 4	" 4	105	101,566	373	97,193	478	198,759	51 " June 21
1869	" 25	" 6	April 30	" 24	117	117,965	440	141,898	557	259,863	61 " Nov. 4
1870	" 18	" 18	" 22	" 27	144	133,912	536	182,934	680	316,846	62 " June 20
1871	" 8	" 1	" 22	" 29	142	146,927	522	204,794	664	351,721	89 " Oct. 27
1872	May 1	" 8	" 5	" 28	215	217,713	512	181,087	727	398,800	84 " " 30
1873	April 25	Nov. 26	" 4	" 21	242	245,237	460	157,241	702	412,478	84 " Aug. 28
1874	" 25	Dec. 13	" 4	" 21	266	262,096	465	161,327	731	423,423	76 " July 6

(Signed) **A. M. RUDOLF,**
Harbour Master.



DESCRIPTION OF WINTER PHENOMENA IN THE ST. LAWRENCE,
 CONTRIBUTED TO THE GEOLOGICAL SOCIETY OF LONDON ON
 THE 15TH JUNE, 1842, BY THE PROVINCIAL GEOLOGIST, W. E.
 LOGAN, Esq.

"The island of Montreal stands at the confluence of the rivers Ottawa and St. Lawrence, and is the largest of several islands splitting up these mighty streams which cannot be said to be thoroughly mingled until they have descended some miles below the whole cluster. The rivers first come in contact in a considerable sheet of water called Lake St. Louis which separate the upper part of the island of Montreal from the southern main. But though the streams here touch, they do not mingle. The waters of the St. Lawrence, which are beautifully clear and transparent, keep along the southern shore, while those of the Ottawa, of a darker aspect, though by no means turbid, wash the banks of the island; and the contrast of colour they present strongly marks their line of contact for many miles.

Lake St. Louis is at the widest part about six miles broad with a length of twelve miles. It gradually narrows towards the lower end, and the river as it issues from it becoming compressed into the space of half a-mile, rushes with great violence down the rapids of Lachine; and although the stream is known to be upwards of eight feet deep, it is thrown into huge surges of nearly as many feet high as it passes over its rocky bottom, which at this spot is composed of layers of trap extending into floors that lie in successive steps.

At the termination of this cascade the river expands to a breadth of four miles, and flows gently on, until it again becomes cramped up by islands and shallows opposite the city of Montreal. From Windmill Point and Point St. Charles above the town, several ledges of rock composed of trap lying in floors, which in seasons of low water are not much below the surface, shoot out into the stream about 1,000 yards; and similar layers pointing to these come out from Longueuil, on the opposite shore. In the narrow channel between these, the water, rushing with much force, produces the Sault Normand, and cooped up a little lower down by the island of St. Helen and several projecting patches of trap, it forms St. Mary's current.

The interval between St. Helen and the south shore is greater than that between it and Montreal; but the former is so floored and crossed by hard trap rocks that the St. Lawrence has as yet produced but little effect in wearing them down, while in the latter it has cut out a channel between thirty and forty feet deep, through which the chief part of its waters rush with a velocity equal to six miles per hour. It is computed that by this channel alone upwards of a million of tons flow past the town every minute.

Between this point and Lake St. Peter, about fifty miles down, the river has an average breadth of two miles, and proceeding in its course with a moderate current, accelerated or retarded a little according to the presence or absence of shoals, it enters the lake by a multitude of channels cut through its delta, and forming a group of low flat alluvial islands.

The frosts commence about the end of November, and a margin of ice of some strength soon forms along the shores of the river and around every island and projecting rock in it; and wherever there is still water it is immediately caked over. The wind acting on this glacial fringe, breaks off portions in various parts and these proceeding down the stream constitute a moving border on the outside of the stationary one which, as the intensity of the cold increases, is continually augmented by the adherence of the ice sheets which have been coasting along it; and as the stationary border thus robs the moving one this still further outflanks the other, until in some parts the margins from the opposite shores nearly meeting, the floating ice becomes jammed up between them, and a night of severe frost forms a bridge across the river. The first ice bridge below Montreal is usually formed at the entrance of the river into Lake St. Peter, where the many channels into which the stream is split up greatly assists the process.

As soon as this winter barrier is thrown across (generally towards Christmas) it of course rapidly increases by stopping the progress of the downward floating ice, which has by this time assumed a character of considerable grandeur, nearly the whole surface of the stream being covered with it, and the quantity is so great, that to account for the supply, many, unsatisfied with the supposition of a marginal origin, have recourse to the hypothesis that a very large portion is formed on, and derived from the bottom of the river where rapid currents exist.

But whatever its origin, it now moves in solid and extensive fields, and wherever it meets with obstacles in its course the momentum of the mass breaks up the striking pack into huge fragments that pile over one another; or if the obstacle be stationary ice, the fragments are driven under it, and there closely packed. Beneath the constantly widening ice barrier mentioned, an enormous quantity is thus driven, particularly when the barrier gains any position where the current is stronger than usual. The augmented force with which the masses then move pushes and packs so much below that the space kept for the river to flow in is greatly diminished, and the consequence is a perceptible rise of the waters above, which indeed from the very first taking of the "bridge," gradually and slowly increases for a considerable way up.

There is no place on the St. Lawrence where all the phenomena of the taking, packing, and shoving of the ice are so grandly displayed as in the neighbourhood of Montreal. The violence of the currents here is so great, and the river in some places expands to such a width, that whether we consider the prodigious extent of the masses moved, or the force with which they are propelled, nothing can afford a more majestic spectacle or impress the mind more thoroughly with a sense of irresistible power. Standing for hours together upon the bank overlooking St. Mary's current, I have seen league after league of ice crushed and broken against the barrier lower down, and there submerged and crammed beneath. And when we reflect that an operation similar to this occurs in several parts, from Lake St. Peter upwards, it will not surprise us that the river should gradually swell.

By the time the ice has become stationary at the foot of St. Mary's current, the waters of the St. Lawrence have usually risen several feet in the Harbour of Montreal,

and as the space through which this current flows affords a deep and narrow passage for nearly the whole body of the river, it may well be imagined that when the packing here begins, the inundation rapidly increases. The confined nature of this part of the channel affords a more ready resistance to the progress of the ice, while the violence of the current brings such an abundant supply, and packs it with so much force that the river, dammed up by the barrier which in many places reaches to the bottom, attains in the Harbour a height usually twenty, and sometimes twenty-five feet above its summer level; and it is not uncommon between this point and the foot of the current, within the distance of a mile, to see a difference in elevation of several feet which undergoes many rapid changes, the waters ebbing or flowing according to the amount of impediment they meet with in their progress, from submerged ice.

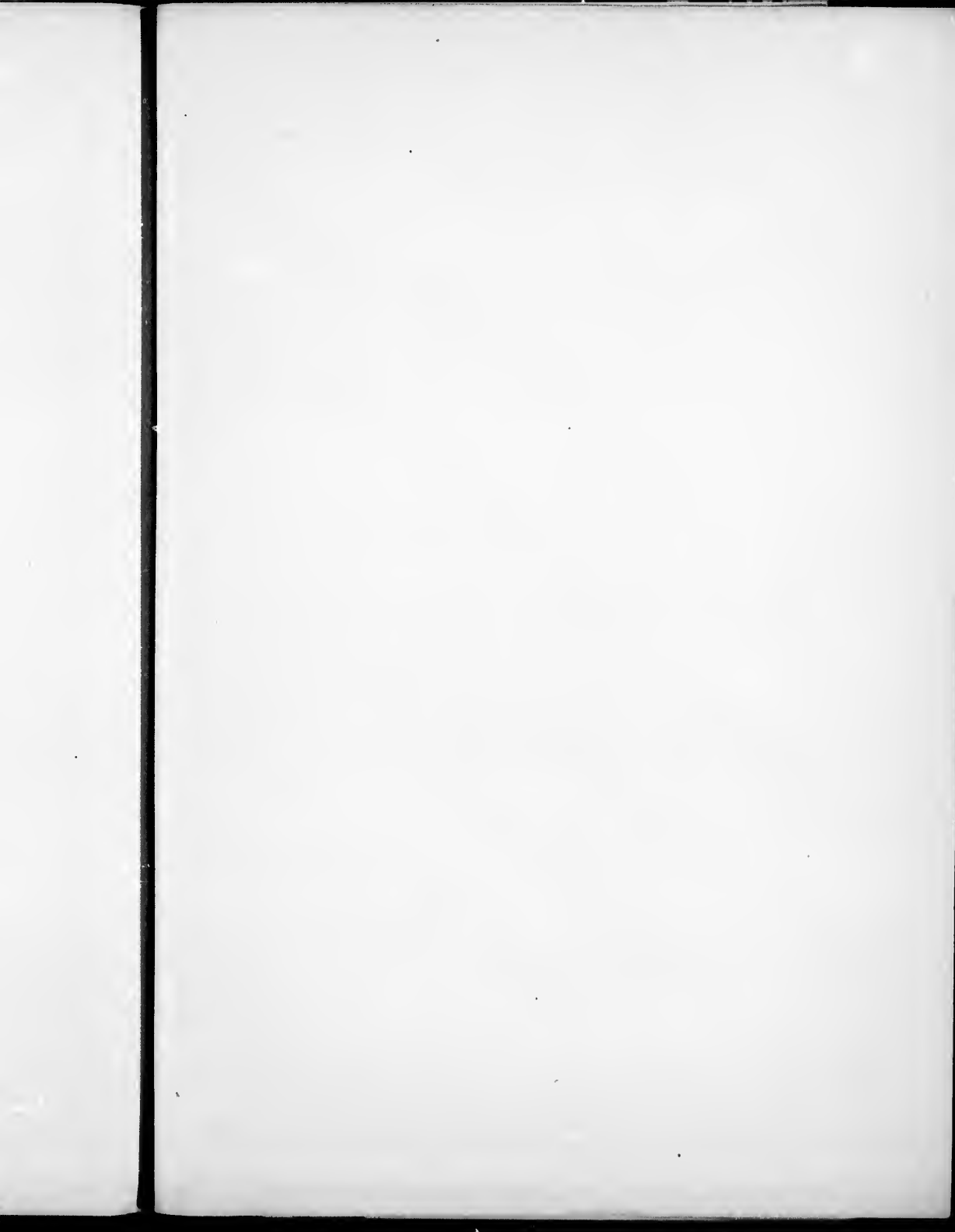
It is at this period that the greatest movements of the ice occur. From the effect of packing and piling, and the accumulation of the snows of the season, the saturation of these with water and the freezing of the whole into a solid body, it attains the thickness of ten to twenty feet and even more; and often it has become fixed as far as the eye can reach, a sudden rise in the water (occasioned, no doubt, in the manner mentioned) lifting up a wide expanse of the whole covering of the river, so high as to free and start it from the many points of rock and resistance offered by the bottom, where it had been packed deep enough to touch it, the vast mass is set in motion by the whole hydraulic power of this gigantic stream. Proceeding onward with a truly terrific majesty it piles up over every obstacle it encounters; and when forced into a narrow part of the channel the lateral pressure it there asserts drives the bordage up the banks, where it sometimes accumulates to the height of forty or fifty feet. In front of the town of Montreal there has lately been built a magnificent revetment wall of cut limestone to the height of twenty-three feet above the summer level of the river. This wall is now a great protection against the effects of the ice. Broken by it, the ice piles on the street or terrace surmounting it, and there stops; but before the wall was built, the stopping bank guided the moving mass up to those of gardens and houses in a very dangerous manner, and many accidents used to occur. It has been known to pile up against the side of a house distant more than two hundred feet from the margin of the river, and there break in at the windows of the second floor. I have seen it mount a terrace garden twenty feet above the bank, and crossing the garden enter one of the principal streets of the town. A few years before the erection of the revetment wall, a friend of mine, tempted by the commercial advantages of the position, ventured to build a large cut stone warehouse. The ground floor was not more than eight feet above the summer level of the river. At the taking of the ice, the usual rise of the water of course inundated the lower storey, and the whole building becoming surrounded by a frozen sheet, a general expectation was entertained that it would be prostrated by the first movement. But the proprietor had taken a very simple and effectual precaution to prevent this. Just before the rise of the waters he securely laid against the sides of the building at an angle of less than 45°, a number of stout oak logs a few feet assunder. When the movement came the sheet of ice was

broken and pushed up the wooden inclined plane thus formed, at the top of which, meeting the wall of the building it was reflected into a vertical position, and falling back in this manner, such an enormous rampart of ice was in a few minutes placed in front of the warehouse as completely shielded it from all possible danger. In some years the ice has piled up nearly as high as the roof of this building. Another gentleman, encouraged by the security which this warehouse apparently enjoyed, erected one of great strength and equal magnitude on the next water lot, but he omitted to protect it in the same way. The result might have been anticipated. Amovement of the ice occurring, the great sheet struck the walls at right angles, and pushed over the building as if it had been a house of curds. Both positions are now secured by the revetment wall. Several movements, of the grand order just mentioned, occur before the final setting of the ice, and each is immediately preceded by a sudden rise of the river. Sometimes several days, and occasionally but a few hours will intervene between them, and it is fortunate that there is a criterion by which the inhabitants are made aware when the ice may be considered at rest for the season; and when it has, therefore, become safe for them to cut their winter roads across its rough and pinnacled surface. This is never the case until a longitudinal opening of some considerable extent appears in some part of St. Mary's current. It has embarrassed many to give a satisfactory reason why this rule, derived from the experience of the peasantry, should be depended on. But the explanation is extremely suitable. The opening is merely an indication that a free sub-glacial passage has been made for itself by the water through the continued influence of erosion and temperature, the effect of which where the current is strongest has been sufficient to wear through to the surface. The formation of this passage shows the cessation of a supply of submerged ice and a consequent security against any further rise of the river to loosen its covering for any further movement. The opening is thus a true mark of safety. It lasts the whole winter, never freezing over, even when the temperature of the air reaches 30° below zero of Fahrenheit; and from its first appearance the waters of the inundation gradually subside, escaping through the channel of which it is the index. The waters seldom or never, however, fall so low as to attain their summer level; but the subsidence is sufficiently great to demonstrate clearly the prodigious extent to which the ice has been packed, and to show that over great occasional areas it has reached to the very bottom of the river. For it will immediately occur to every one that when the mass rests on the bottom its height will not be diminished by the subsidence of the water, and that as this proceeds, the ice according to the thickness which it has in various parts attained, will present various elevations after it has found a resting place beneath, until just so much is left by the stream as is sufficient to permit its free escape. When the subsidence has attained its maximum, the trough of the St. Lawrence, therefore, exhibits a glacial landscape undulating into hills and valleys that run in various directions, and while some of the principal mounds stand upon a base of five hundred yards in length by a hundred or two in breadth, they present a height of ten to fifteen feet above the level of those points still supported in the water."

LIST OF PLANS.

- | | | |
|-------------|-----|---|
| PLAN No. 1, | ... | PLAN OF EXISTING HARBOUR. |
| " | 2, | GENERAL PLAN OF IMPROVEMENTS. |
| " | 3, | } ... DIAGRAMS SHOWING PROGRESSIVE STAGES
OF IMPROVEMENTS. |
| " | 4, | |
| " | 5, | |
| " | 6, | |
| " | 7, | ALTERNATIVE PLAN OF IMPROVEMENTS. |
| " | 8, | PLAN AND JOURNAL OF BORES. |







100-857

MEYER STREET

PEAR STREET

CROCKETT

T BASIN

TOUVILLE

BASIN

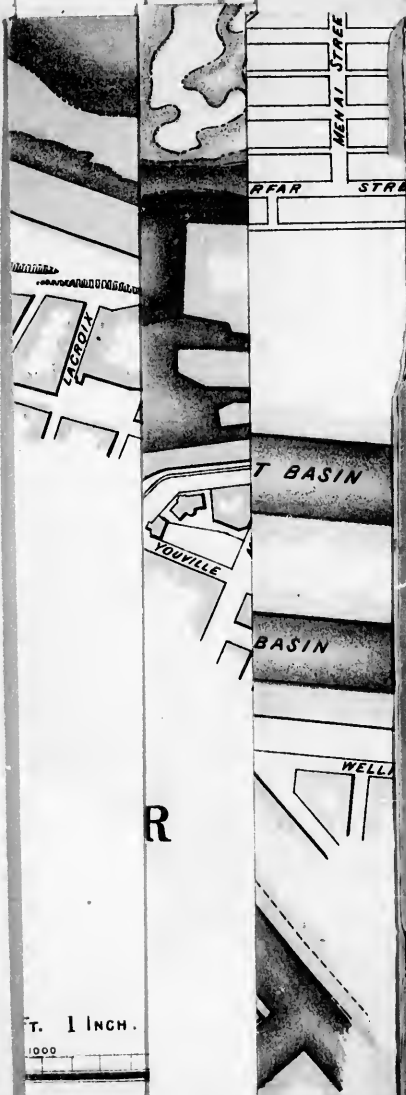
WELL

RENCE,
GS,

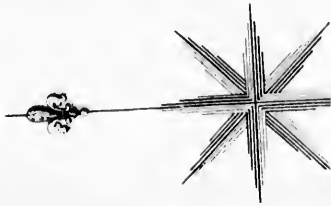
R

T. 1 INCH.

1000



LONGUEUIL



LONGUEUIL
WHARF

R

I

V

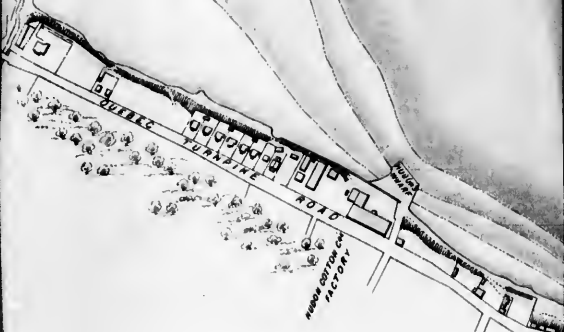
E

R

ILE RONDE

ST. MAR

PUSSAUBIER



NOCHELAGA WHARF

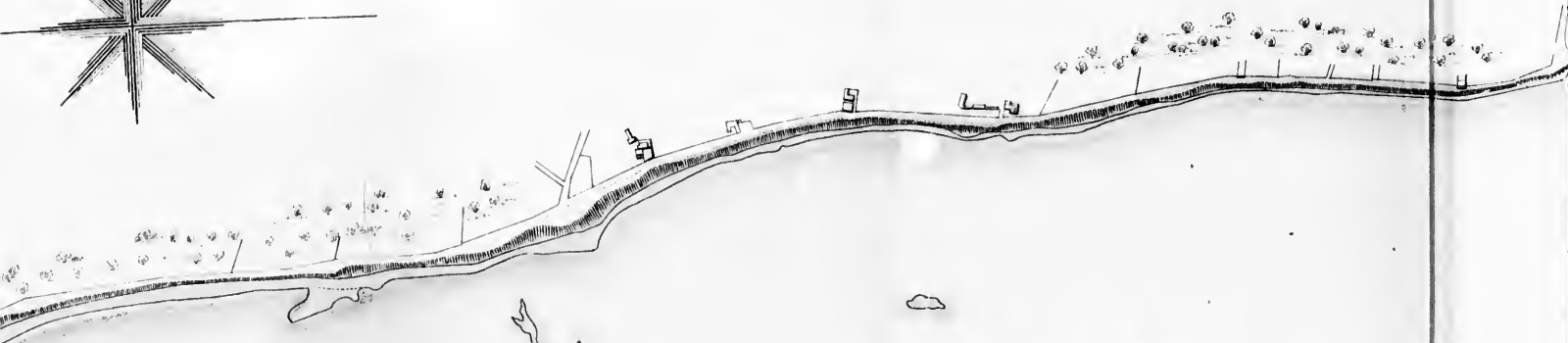
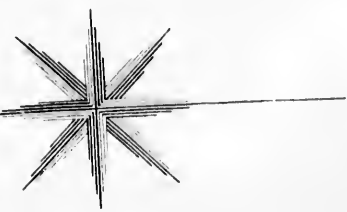
CAMPBELL ST
ROBERTS ST
GALE ST
MONTGOM ST
DANDVILLE ST

PASSENGER
DEPOT

WATERBURY

MADEIRA WHARF

ST LA



MOFFAT'S

R S T L A

ST HELEN'S ISLAND

ILE VERTE

BARRACKS

ILE RONDE

ST. MARY'S CURRENT

MULSON'S WHARF

MONARQUE'S WHARF

ST LAMBERT'S

MOFFAT'S ISLAND

ST LAMBERT'S WHARF

W

R

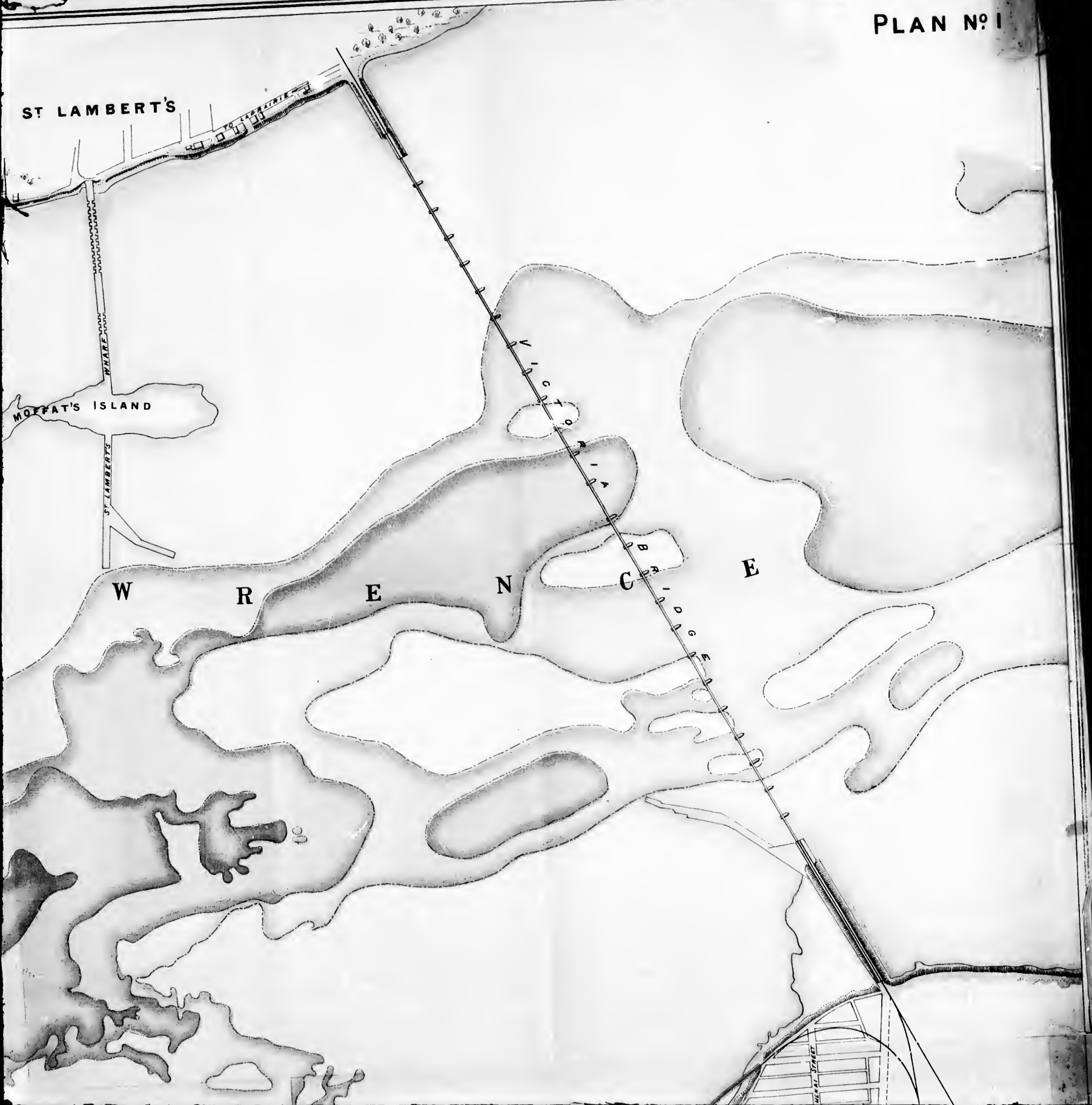
E

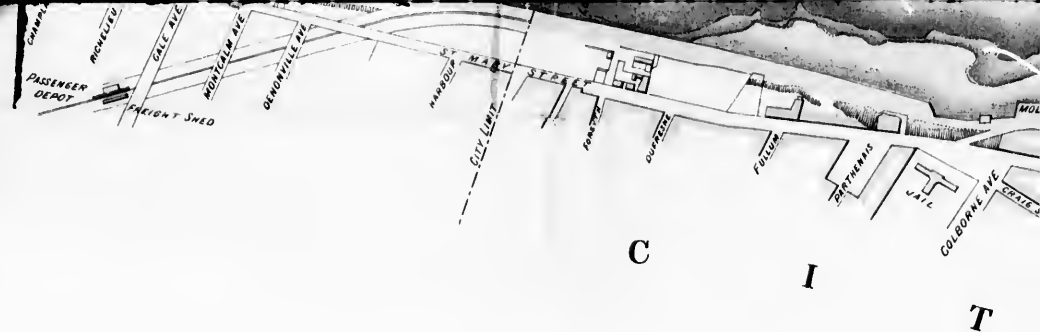
N

C

E

ST LAMBERT'S





PLAN
 OF THE
HARBOUR OF MONTREAL,

SHOWING THE PRESENT HARBOUR & THE RIVER ST. LAWRENCE,
 COMPILED & CONTOURED FROM SURVEYS & SOUNDINGS.

Made under the Direction of the

BOARD OF ENGINEERS.

BY MESS^{RS} R. B. BELL & D. MILLER, GLASGOW.

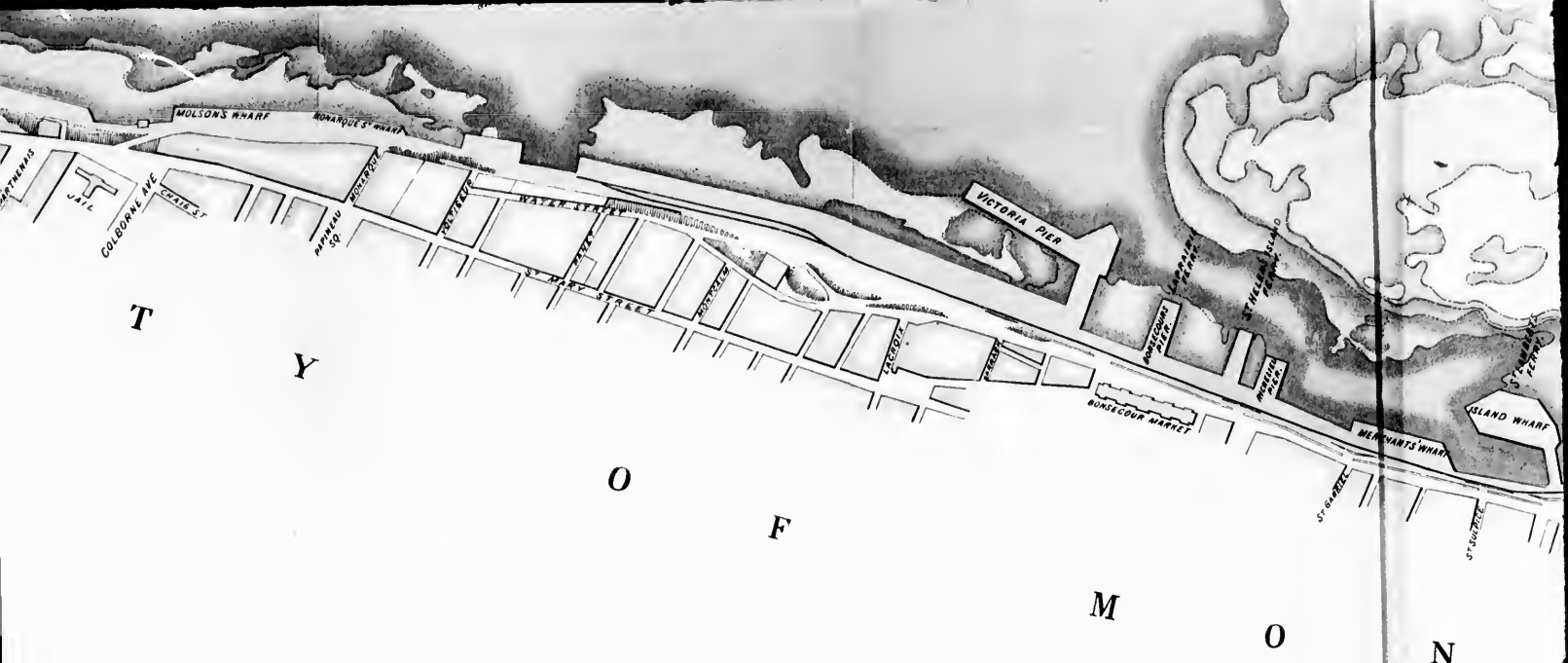
1877.

Robt Bruce Bell





John Newton

Samuel Bell

One Fathom
Two do
Three do
Four do

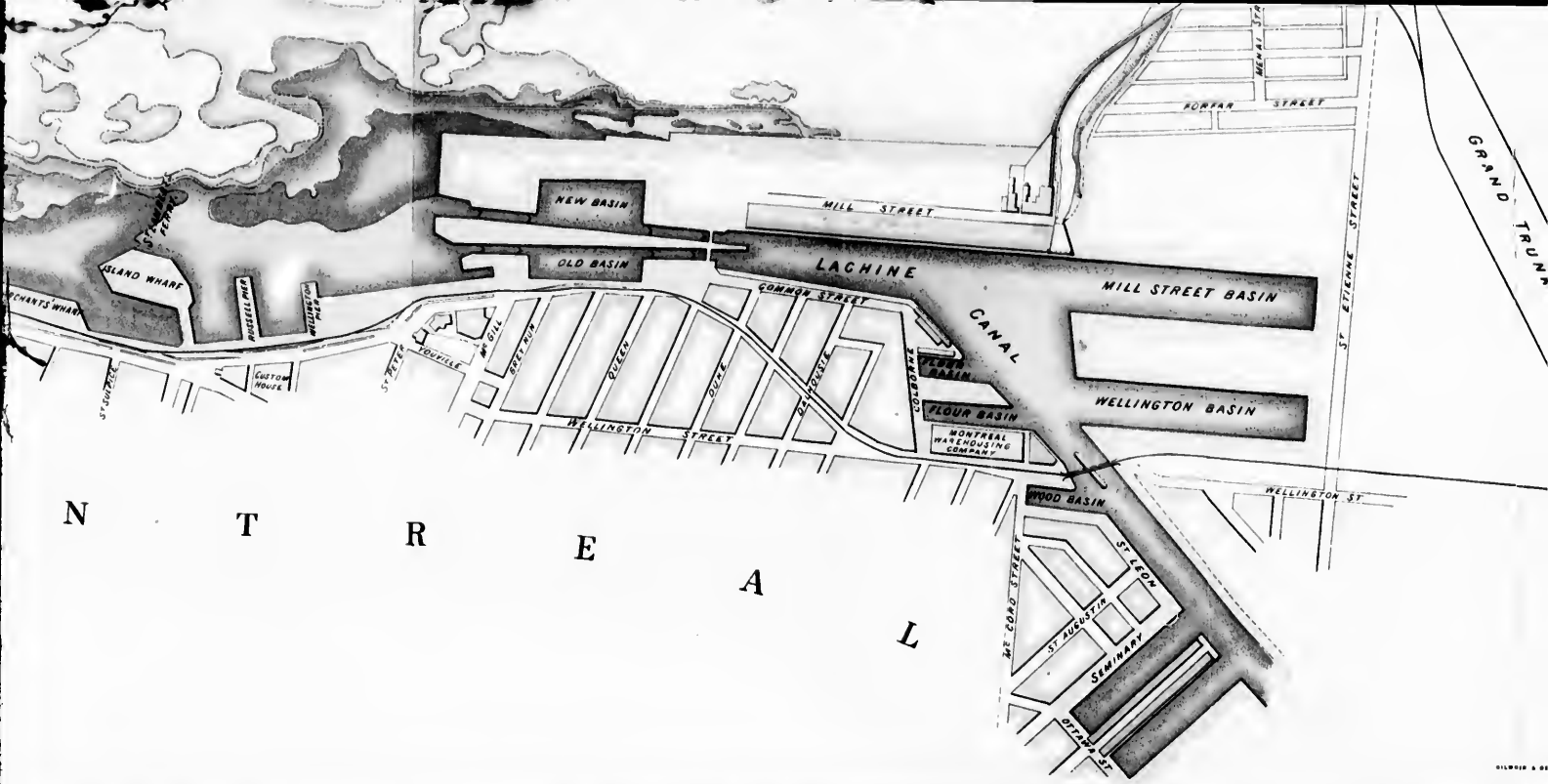


NOTE

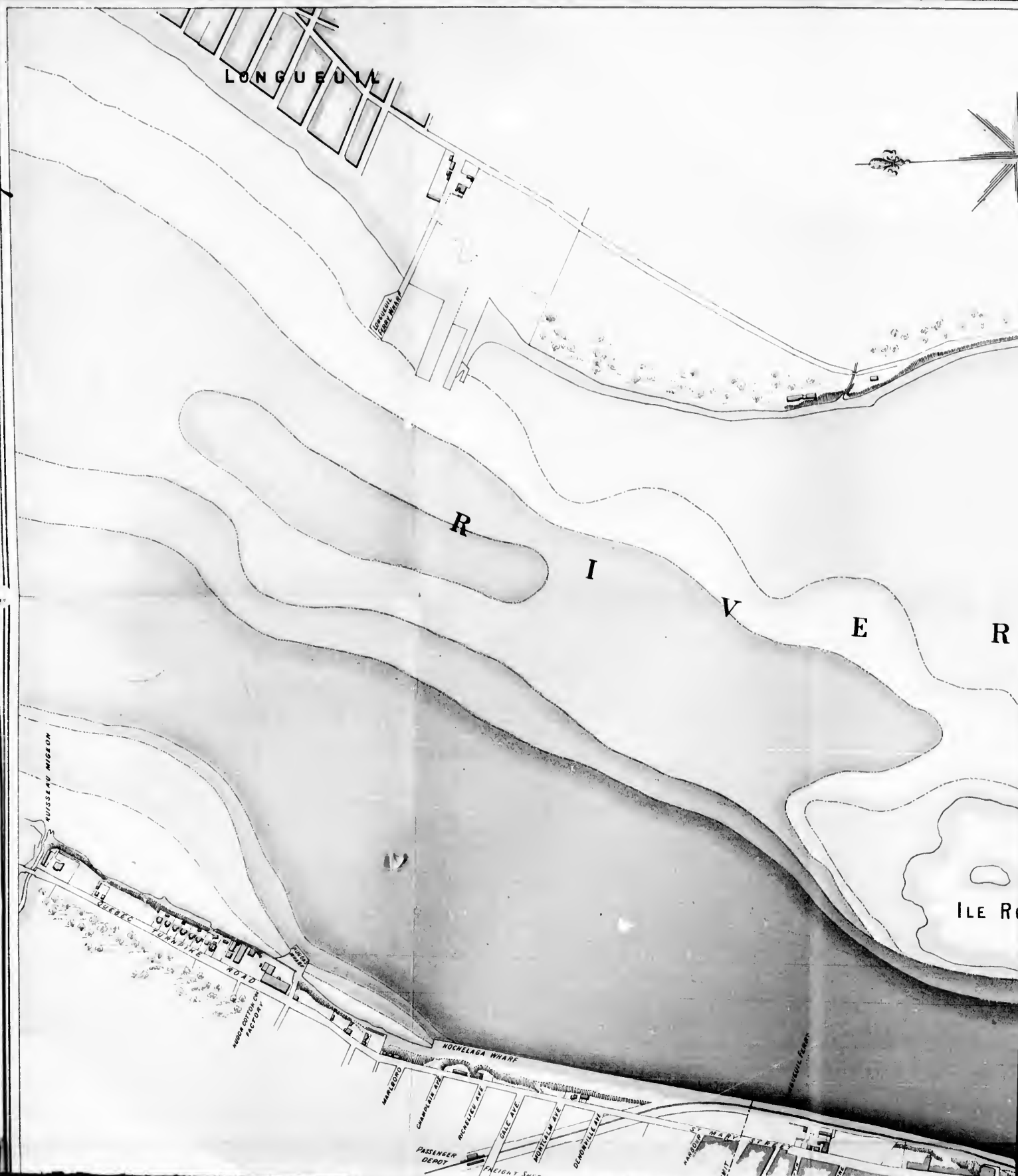
One Fathom line, coloured thus 
 Two do do do do 
 Three do do do do 
 Four do do do do 

SCALE 600 FT. 1 INCH





MONTREAL



LONGUEUIL

SAGINAW RIVER

ILE ROYALE

WINDS COTTON FACTORY

SAGINAW COTTON FACTORY

MICHELLAGA WHARF

MARSEBO

CHAMPLAIN AVE

ROCHELLE AVE

GILE AVE

MONTICM AVE

DORNOVILLE AVE

PASSENGER DEPOT

SHED

SAGINAW FERRY

WINDS COTTON FACTORY

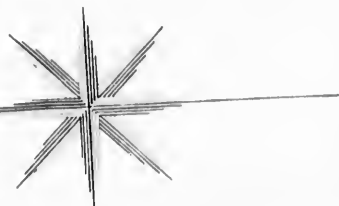
SAGINAW COTTON FACTORY

MICHELLAGA WHARF

PASSENGER DEPOT

SHED

ST



MOFFAT

R S T L A

ST. HELEN'S ISLAND

BARRACKS

ILE VERTE

ILE RONDE

MULSON'S WHARF
MORANVILLE'S WHARF



ST LAMBERT'S

MOFFAT'S ISLAND

W R E N C E

VICTORIA

BRIDGE

Revetment Wall carried to height of Railway Embankment, or built with isolated ice breakers.

INCLINE

LOW LEVEL WHARF

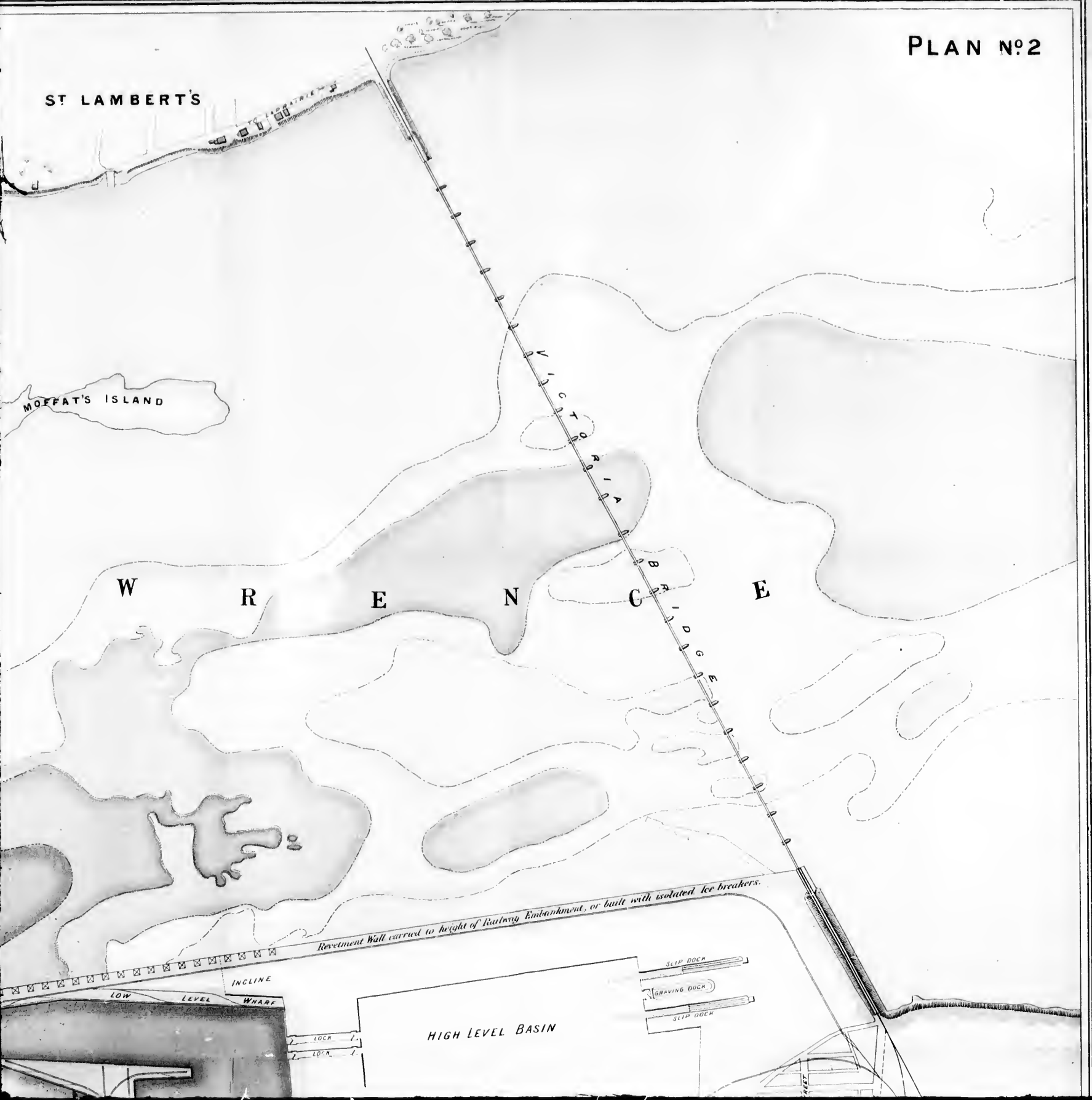
LOCK
LOCK

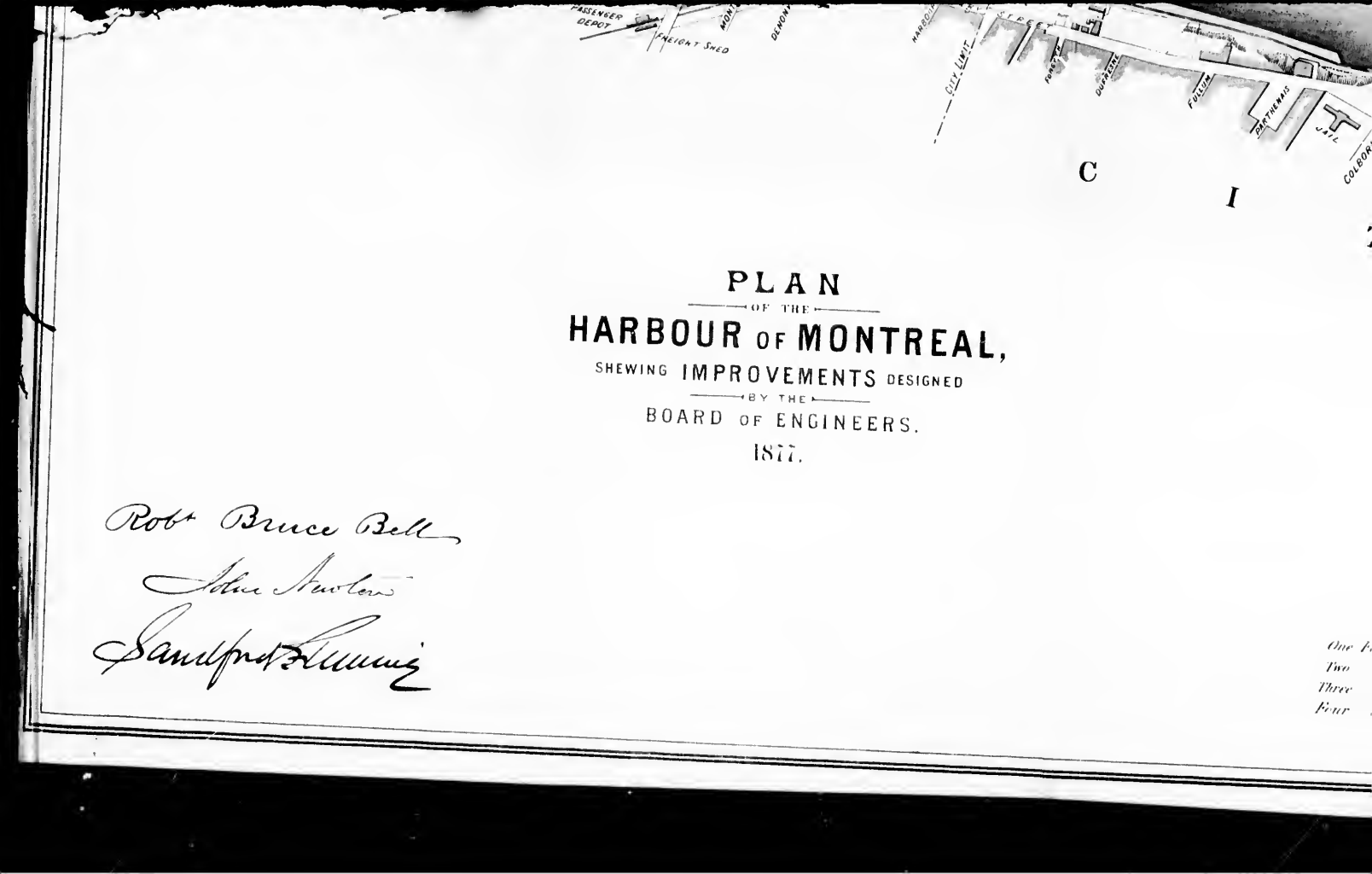
HIGH LEVEL BASIN

SLIP DOCK

GRAVING DOCK

SLIP DOCK

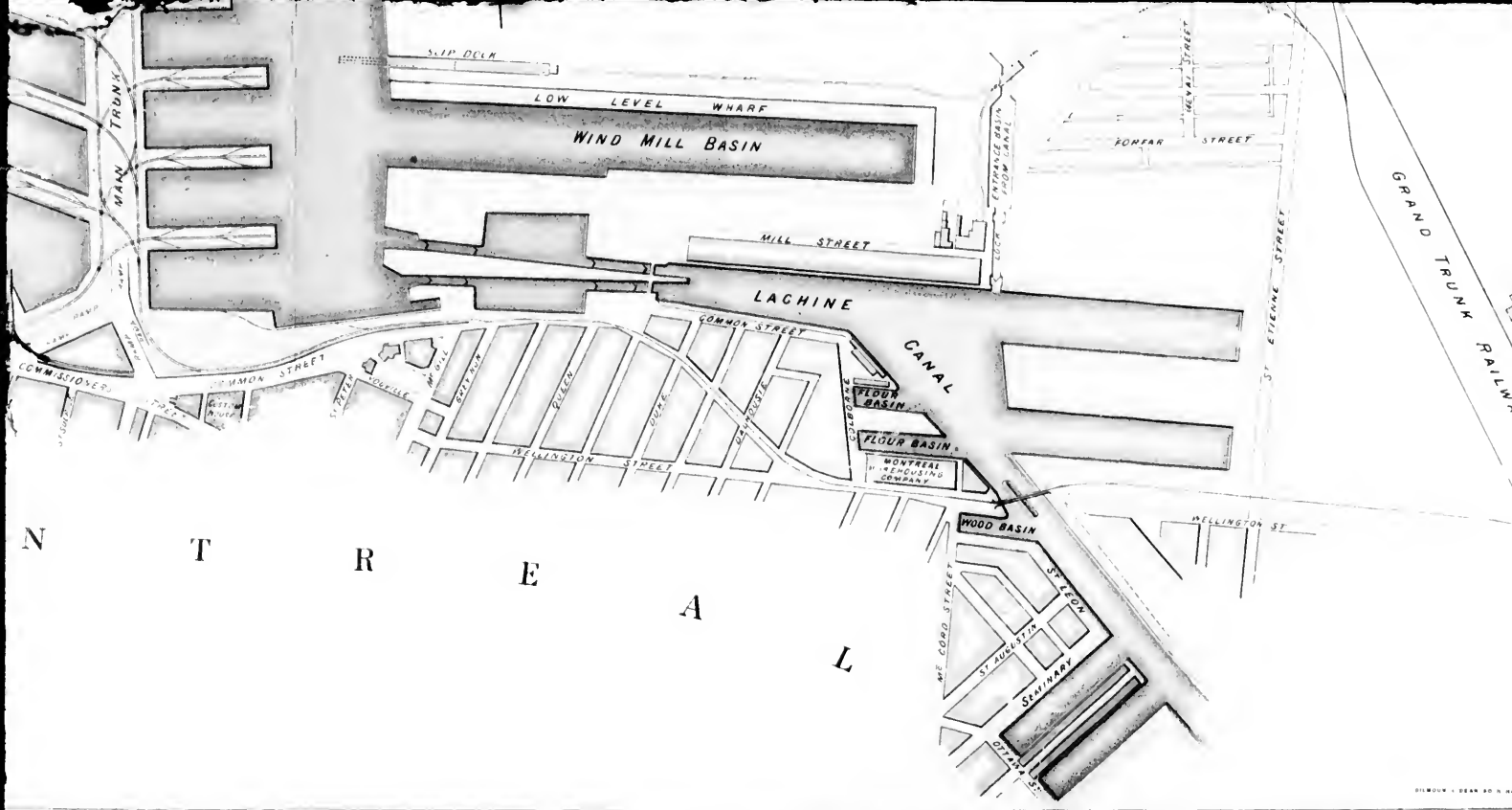




PLAN
OF THE
HARBOUR OF MONTREAL,
SHEWING IMPROVEMENTS DESIGNED
BY THE
BOARD OF ENGINEERS.
1877.

Robt Bruce Bell
John Newton
Samuel Luning

One
Two
Three
Four



MONTREAL

SLIP DOCK

LOW LEVEL WHARF

WIND MILL BASIN

MILL STREET

LACHINE

CANAL

FLOUR BASIN

FLOUR BASIN

MONTREAL
REFINING
COMPANY

WOOD BASIN

SEMINARY

FORBES STREET

ST. ETIENNE STREET

GRAND TRUNK RAILWAY

COMMON STREET

COMMON STREET

COMMON STREET

ST. MARY

ROCHELLE

ST. JAMES

ST. JOHN

ST. PAUL

ST. GEORGE

ST. MICHAEL

ST. ANNE

ST. JOSEPH

ST. CHARLES

ST. MARY

ST. JOHN

ST. GEORGE

ST. MICHAEL

ST. ANNE

ST. JOSEPH

ST. CHARLES

ST. MARY

ST. JOHN

ST. GEORGE

ST. LOUIS

ST. MARY

ST. JOHN

ST. GEORGE

ST. MICHAEL

ST. ANNE

ST. JOSEPH

ST. CHARLES

ST. MARY

ST. JOHN

ST. GEORGE

ST. MICHAEL

ST. ANNE

ST. JOSEPH

ST. CHARLES

ST. MARY

ST. JOHN

ST. GEORGE

ST. MICHAEL

ST. ANNE

ST. JOSEPH

ST. CHARLES

ST. MARY

ST. JOHN

ST. GEORGE

ST. MICHAEL

ST. ANNE

ST. JOSEPH

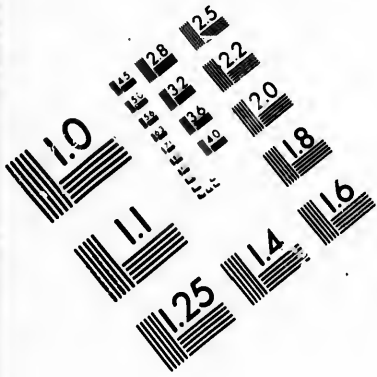
ST. CHARLES

ST. MARY

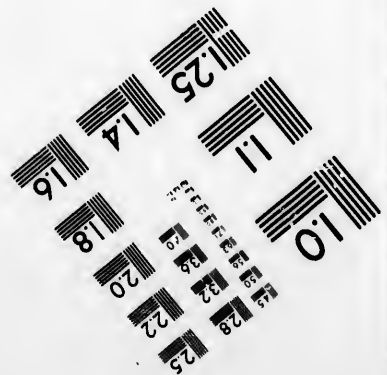
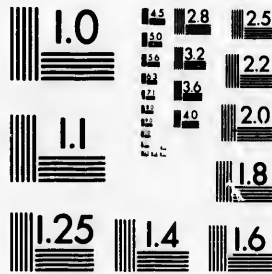
ST. JOHN

ST. GEORGE

ST. MICHAEL

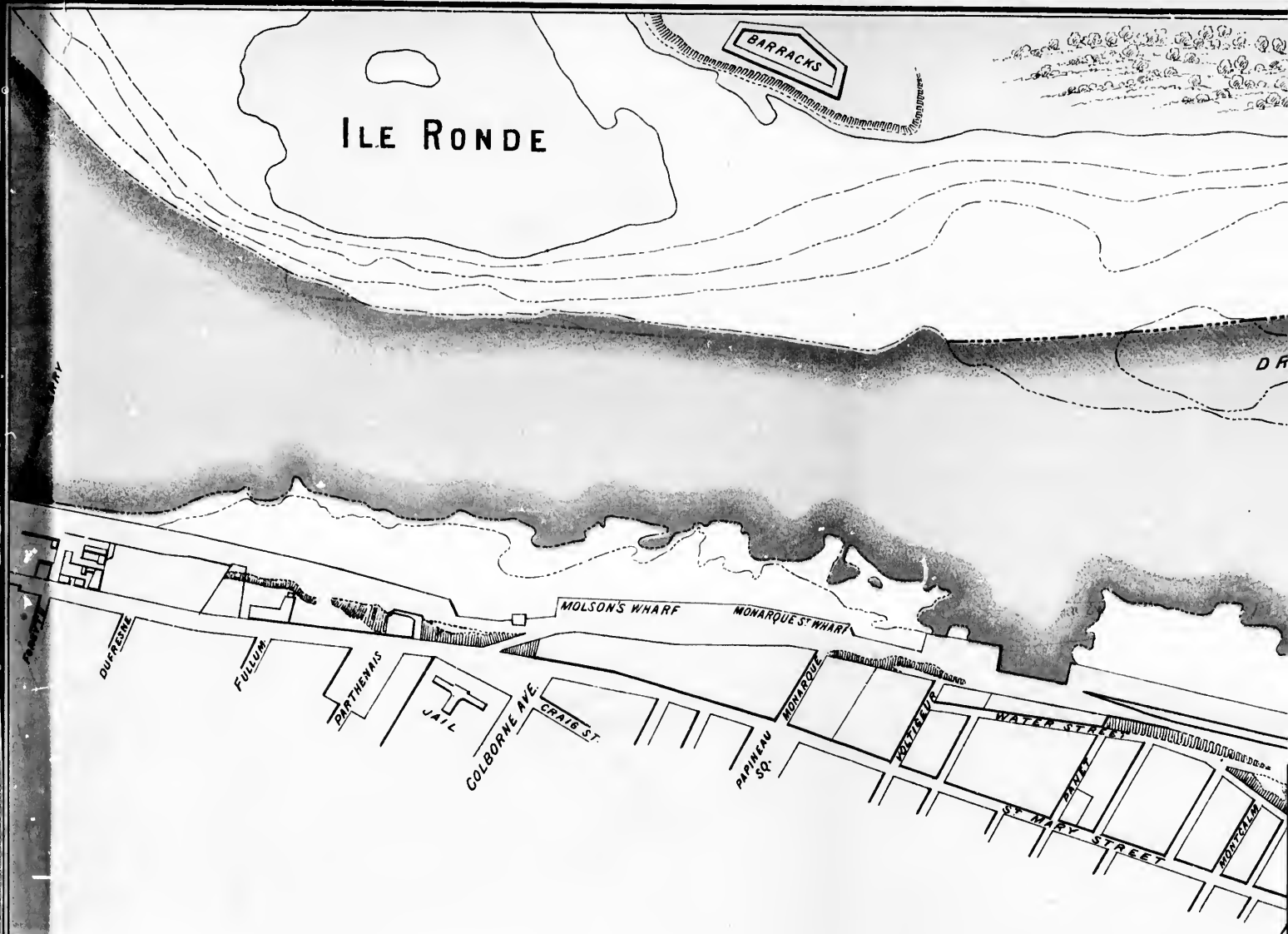


**IMAGE EVALUATION
TEST TARGET (MT-3)**

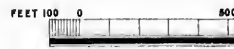


28
22
25
22
20

10



IMPROVEMENT OF MONTREAL HARBOUR,
 PROGRESSIVE PLAN OF WORK,
 FIRST STAGE.





DREDGING

DREDGING FOR NEW CHANNEL

VICTORIA PIER

BONSECOURS PIER

RICHELIEU PIER

DREDGING

BONSECOURS MARKET

SCALE



CUSTOM HOUSE

STREET

LINE OF WORK ON SHOAL GROUND
BREAKWATER

CHANNEL

BREDDING

MILL STREET

LACHINE

COMMON STREET

CANAL

FLOUR BASIN

FLOUR BASIN

MONTREAL
WAREHOUSING
COMPANY.

FORFAR STREET

MENAI STREET

ST. ETIENNE STREET

ST. PETER

YOVILLE

MC GILL

GREY HUN

QUEEN

DUKE

DASHBOURIE

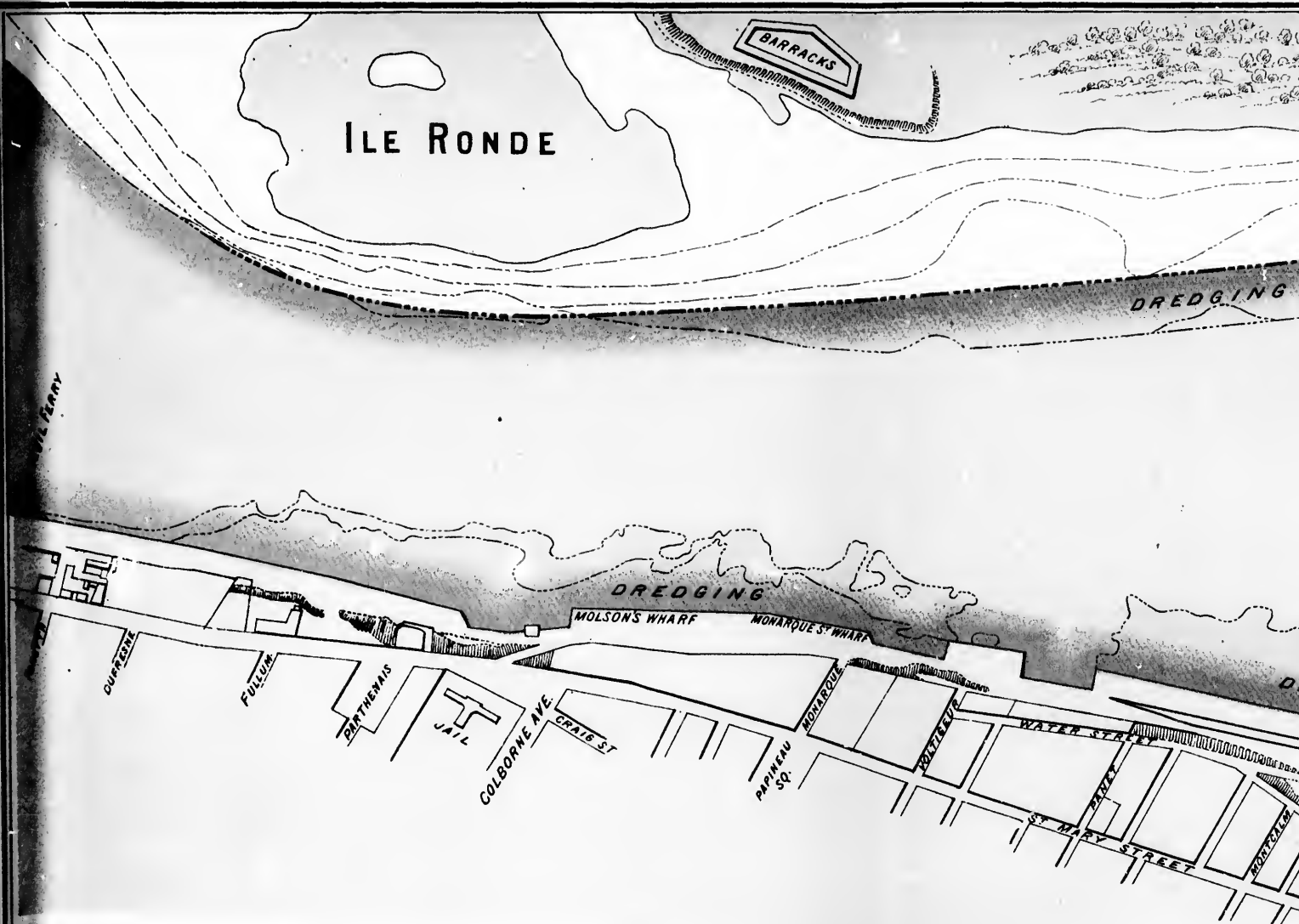
COLBORNE

WELLINGTON STREET

STREET

TOM

SE



IMPROVEMENT OF MONTREAL HARBOUR,
 PROGRESSIVE PLAN OF WORK.
 SECOND STAGE.

FEET 100 0

DREDGING

DREDGING FOR NEW

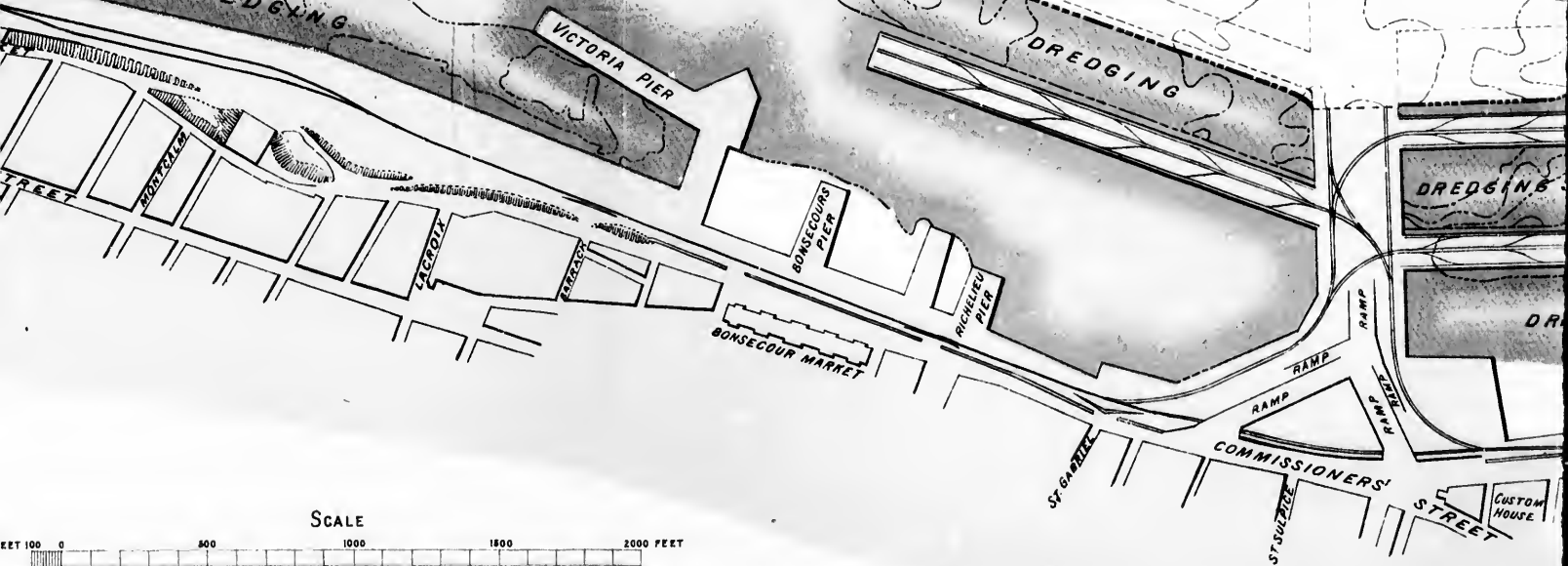
DREDGING

VICTORIA PIER

DREDGING

DREDGING

DR



SCALE

FEET 100 0 500 1000 1500 2000 FEET

LINE OF WORK ON SHOAL GROUND
BREAKWATER

NEW CHANNEL

DREDGING

DREDGING

MILL STREET

LACHINE

COMMON STREET

CANAL

FLOUR BASIN

FLOUR BASIN

MONTREAL
WAREHOUSING
COMPANY.

GINN

CUSTOM
HOUSE

ST. PETER

YOVILLE

MR. GILL

BREYER

QUEEN

DUKE

DE HOUSE

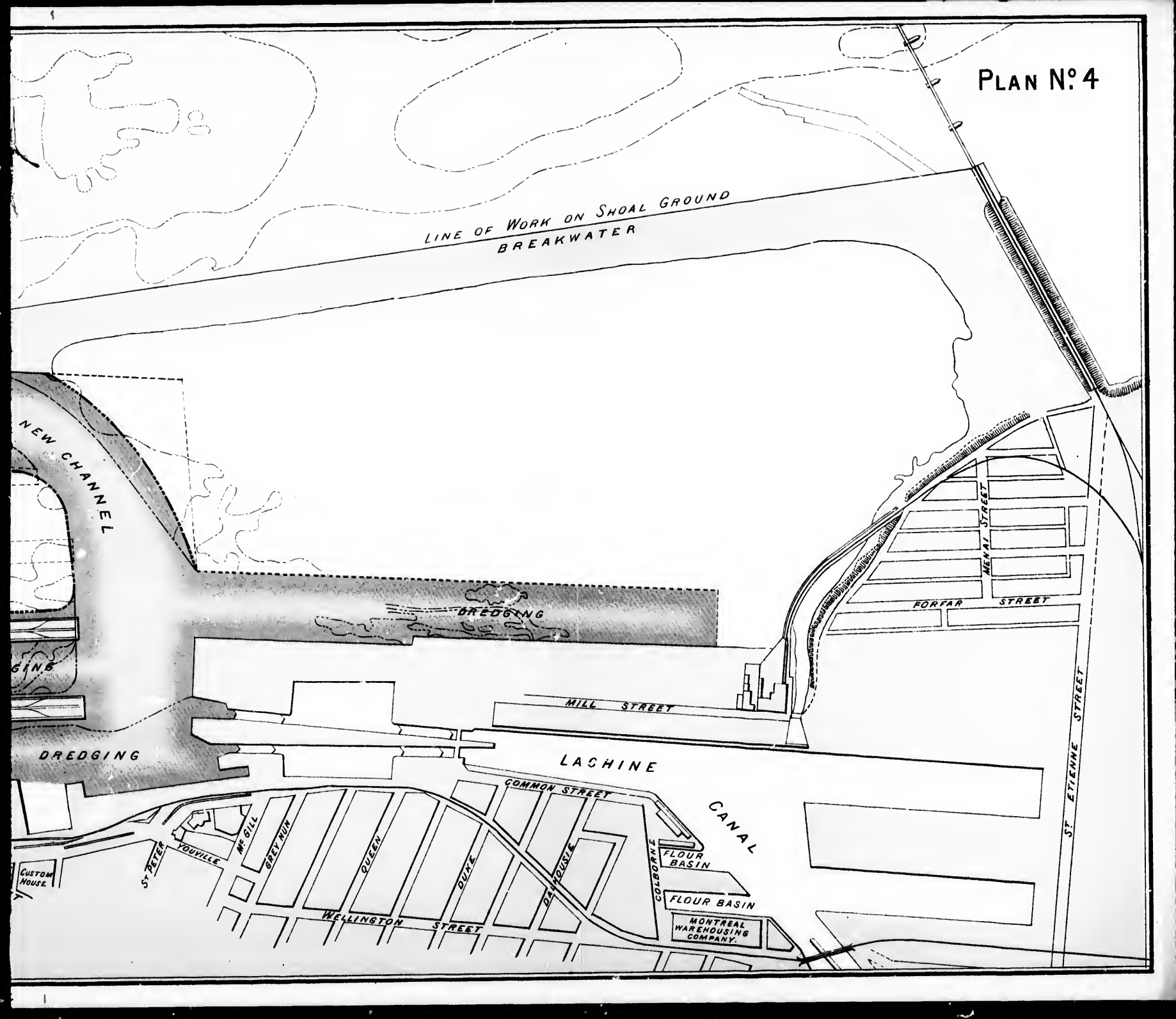
COLBORNE

WELLINGTON STREET

FORFAR STREET

MENAL STREET

ST. ETIENNE STREET

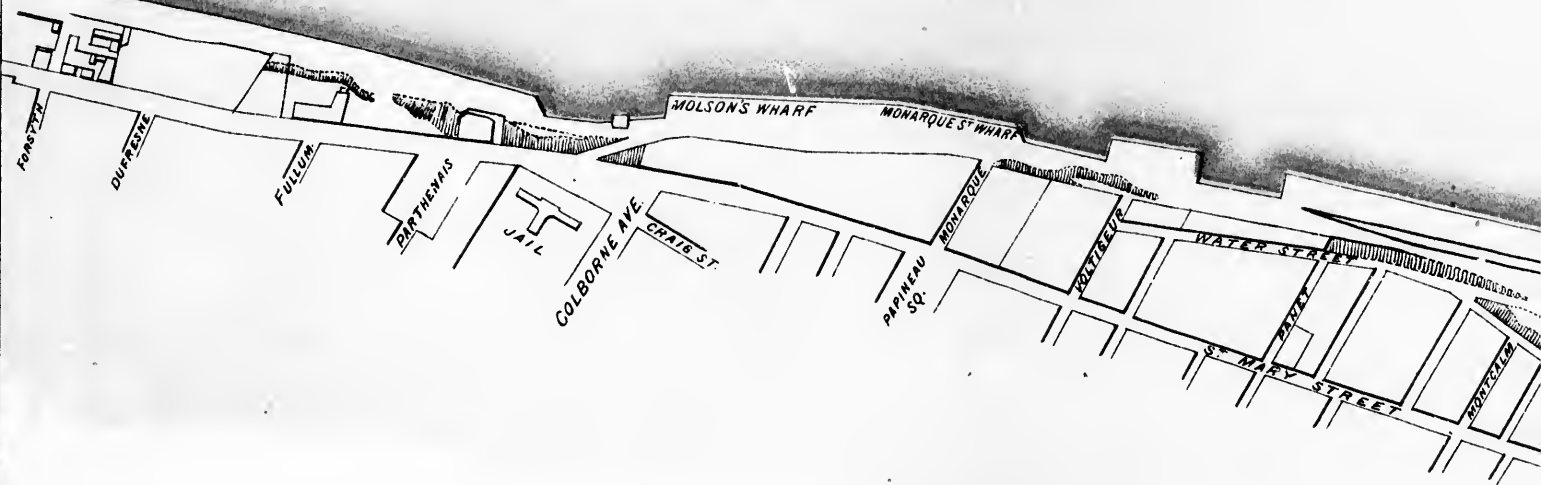


ILE RONDE

BARRACKS

DRE

LONGUEUIL FERRY



IMPROVEMENT OF MONTREAL HARBOUR,
PROGRESSIVE PLAN OF WORK,
THIRD STAGE.



BREAKWATER

DREDGING

WIND MILL BASIN

FORFAR STREET

MENAL STREET

MILL STREET

LACHINE

COMMON STREET

CANAL

FLOUR BASIN

FLOUR BASIN

MONTREAL
WAREHOUSING
COMPANY.

ST. ETIENNE STREET

N STREET

ST. PETER

YOUVILLE

MC GILL

BREY RAIN

QUEEN

DUKE

CLAYHOUSE

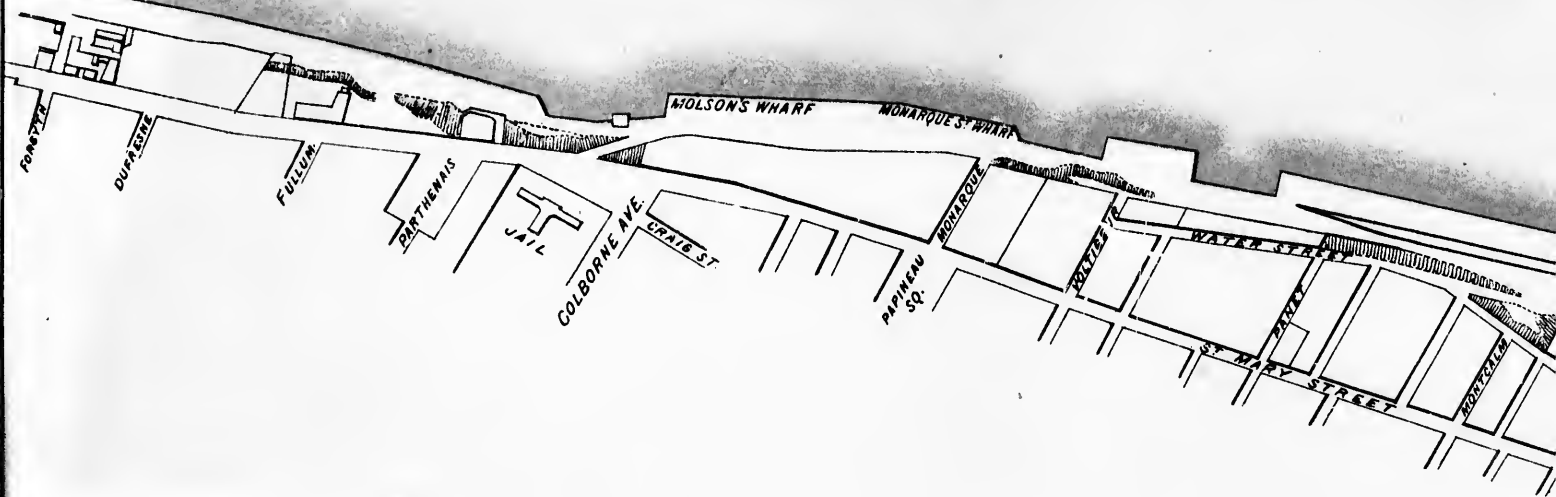
COLBORNE

WELLINGTON STREET

ILE RONDE

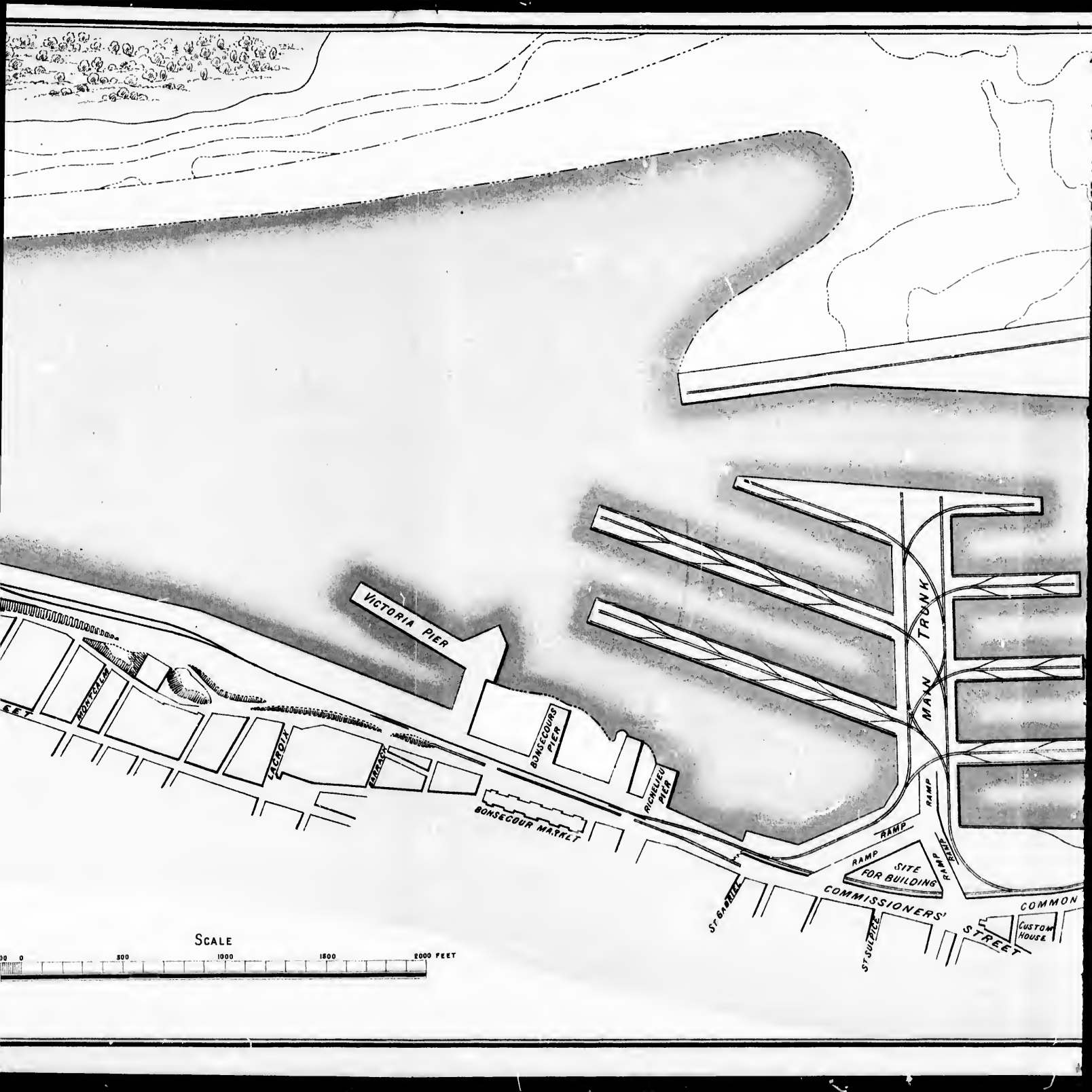
BARRACKS

LONGUEUIL FERRY



IMPROVEMENT OF MONTREAL HARBOUR,
PROGRESSIVE PLAN OF WORK.
FOURTH STAGE.

FEET 100 0 300



VICTORIA PIER

BOISEGOURS PIER

MICKLEU PIER

BOISEGOUR MARKET

LAETOTY

MAN TRUNK

RAMP

RAMP

RAMP

SITE FOR BUILDING

ST. BARTHELEMY

COMMISSIONERS' STREET

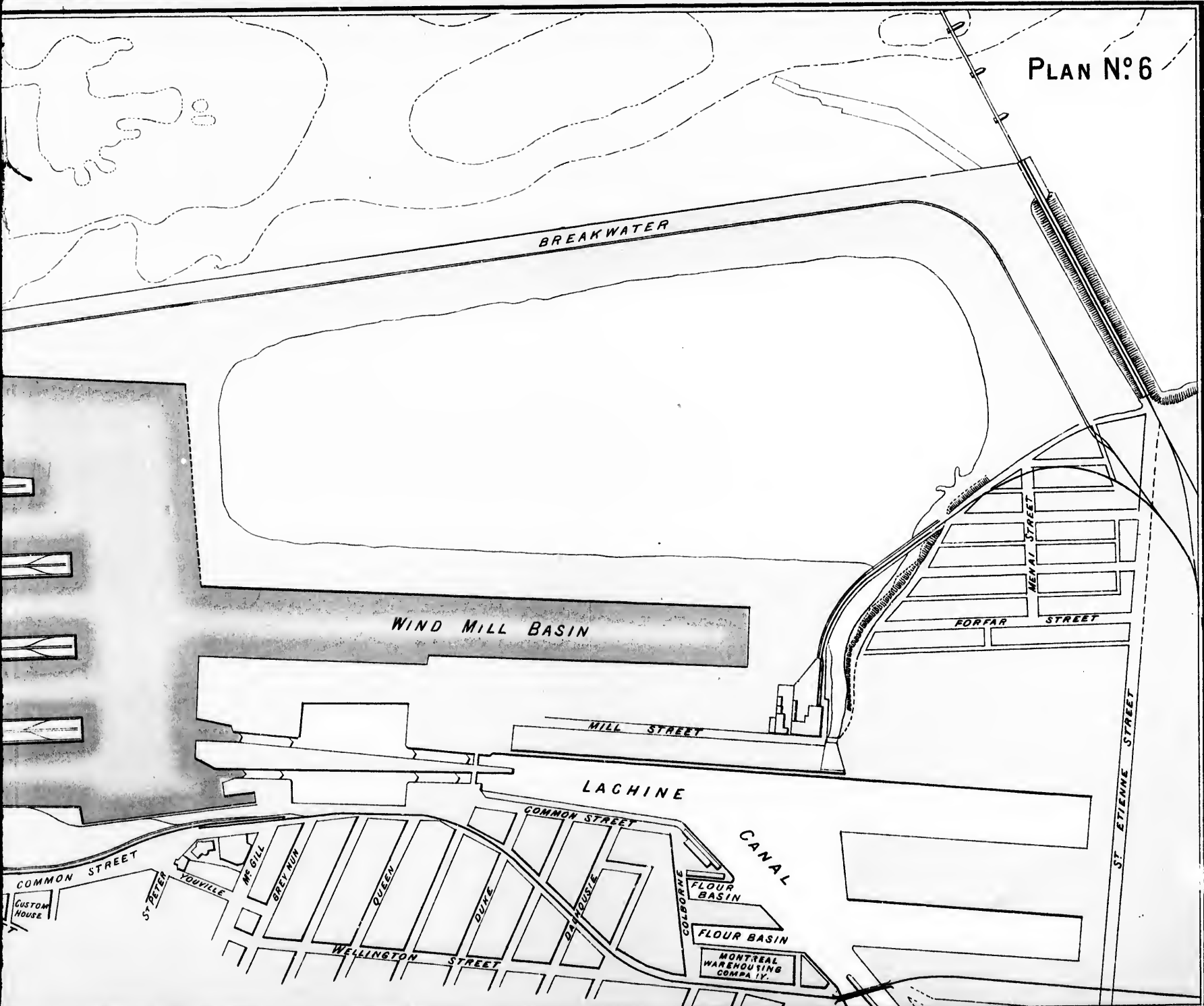
ST. SUZIEE

COMMON STREET

COMMON CUSTOM HOUSE

SCALE

0 500 1000 1500 2000 FEET



ILE RONDE

BARRACKS

LONGUEUIL FERRY

MOLSON'S WHARF

MONARQUE'S WHARF

FOUR ST

DUFFENE

FULUM

PARTHENAS

JAIL

COLBORNE AVE

CRAIG ST

PAPINEAU SQ

MONARQUE

WATSON

WATER STREET

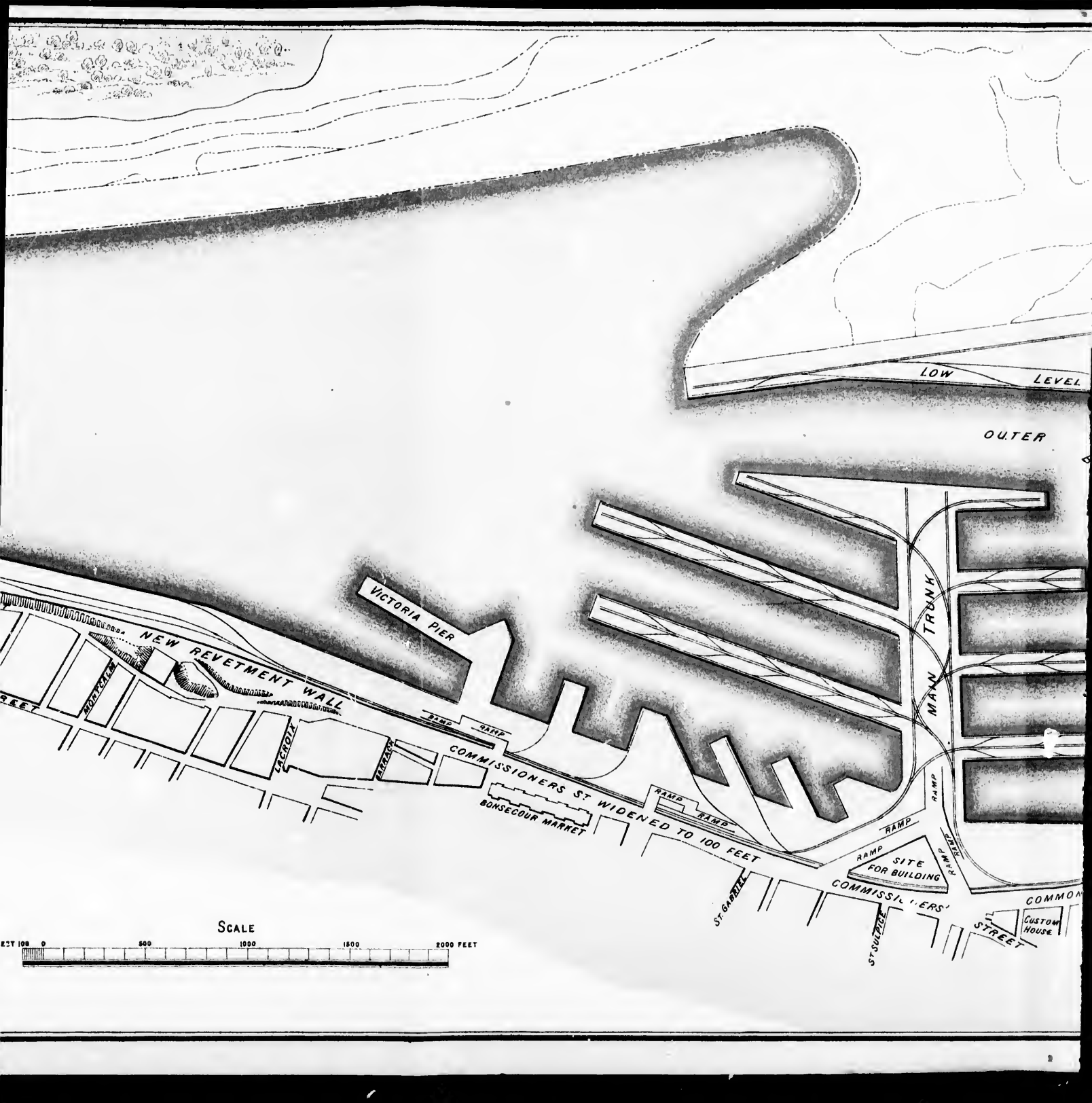
ST MARY STREET

ROBYN STREET

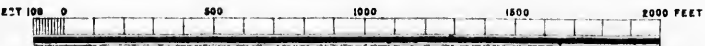
IMPROVEMENT OF MONTREAL HARBOUR,
PLAN SHEWING
ALTERNATIVE SCHEME FOR HIGH LEVEL WORKS
AND FOR
BREAST WORKS.

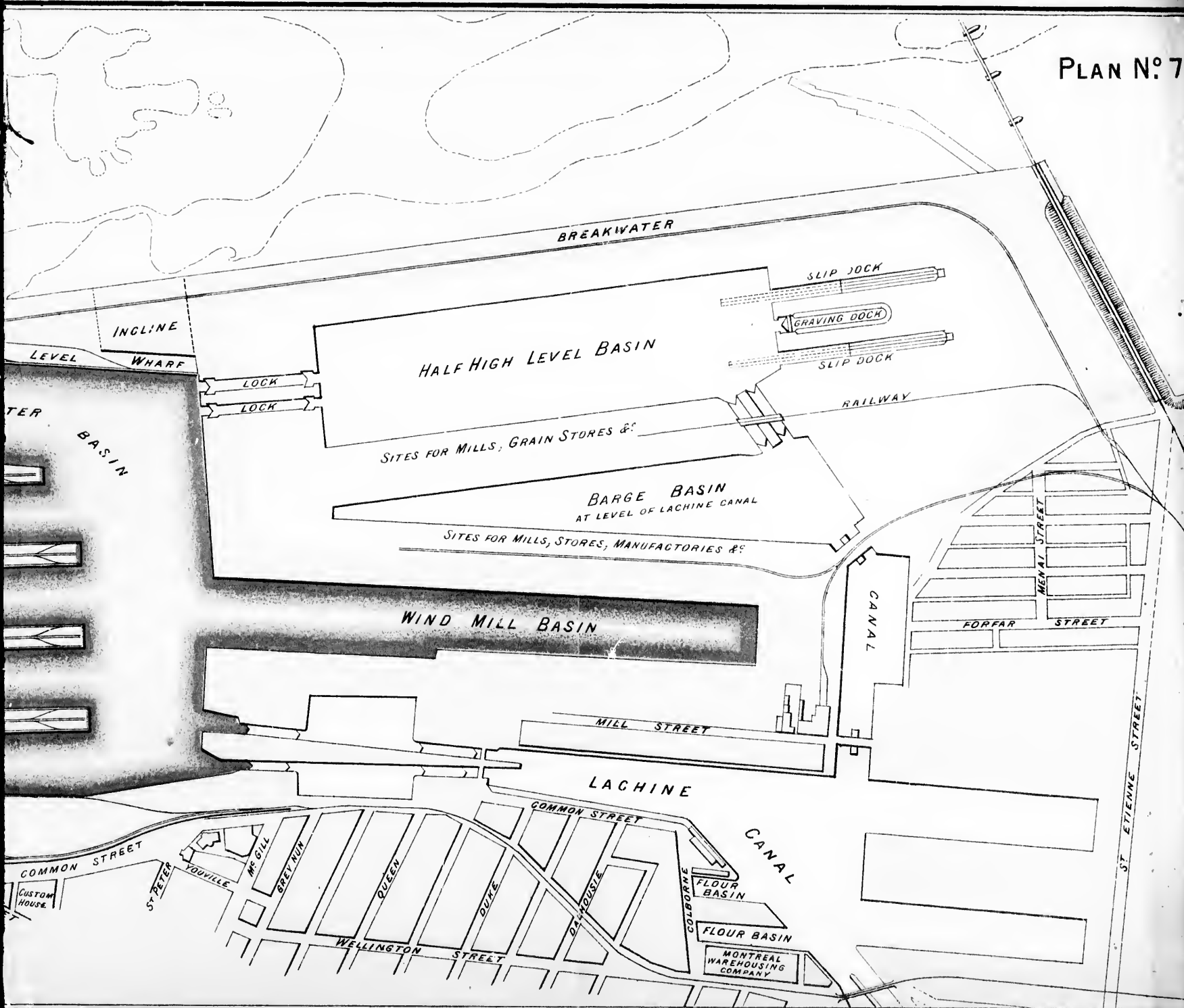
FEET 100 0

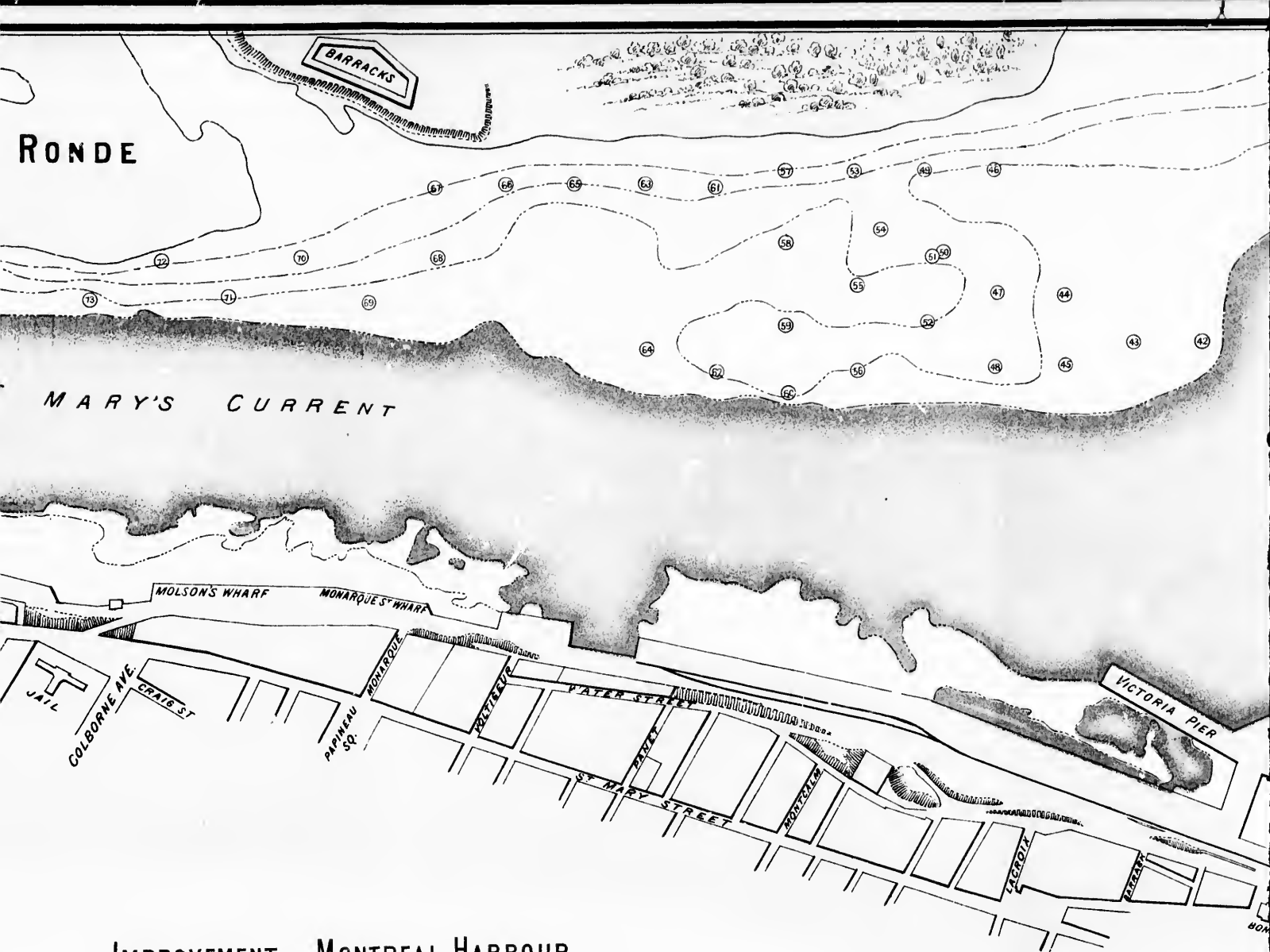




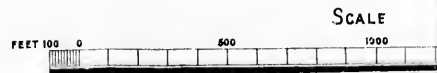
SCALE

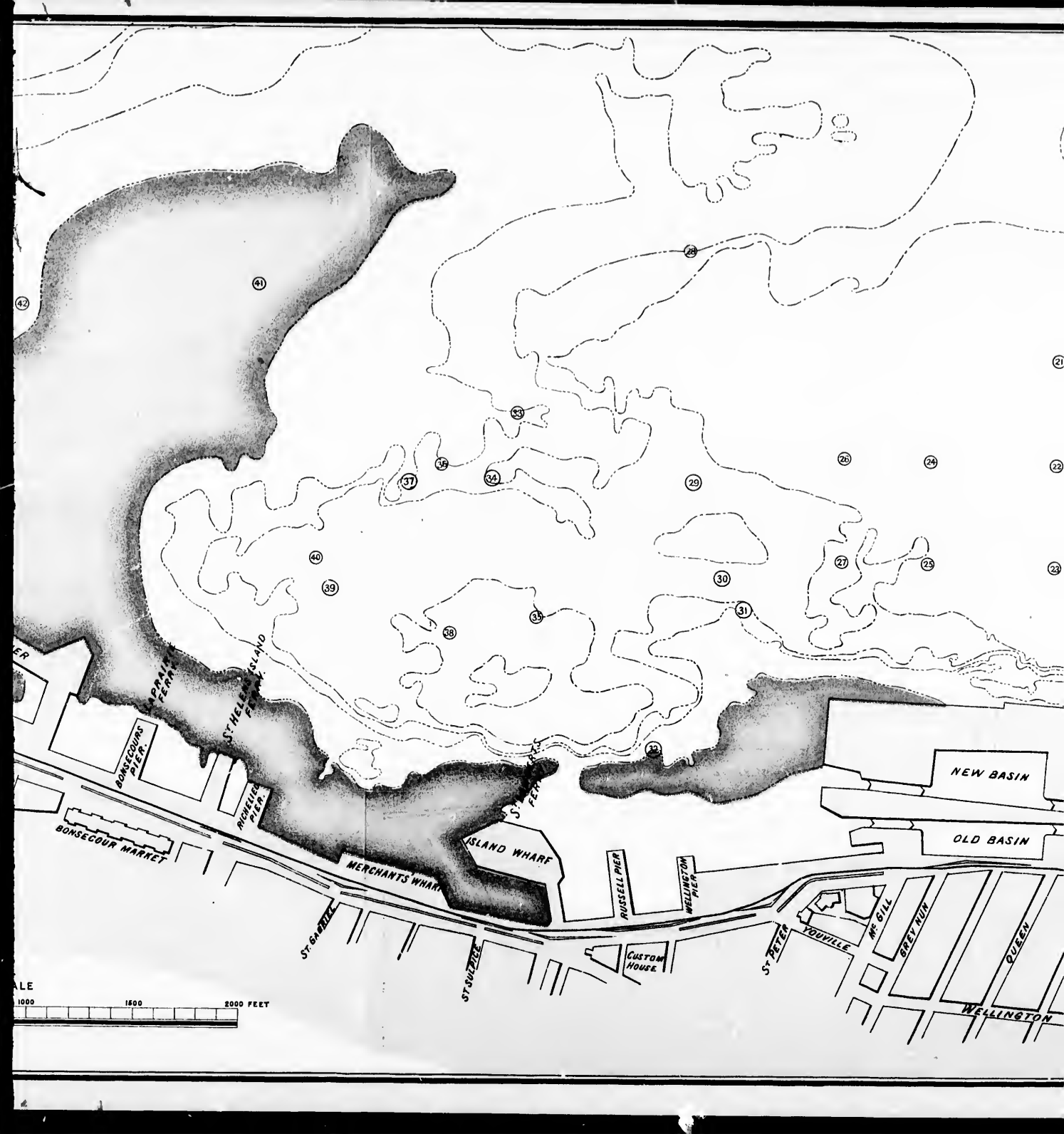




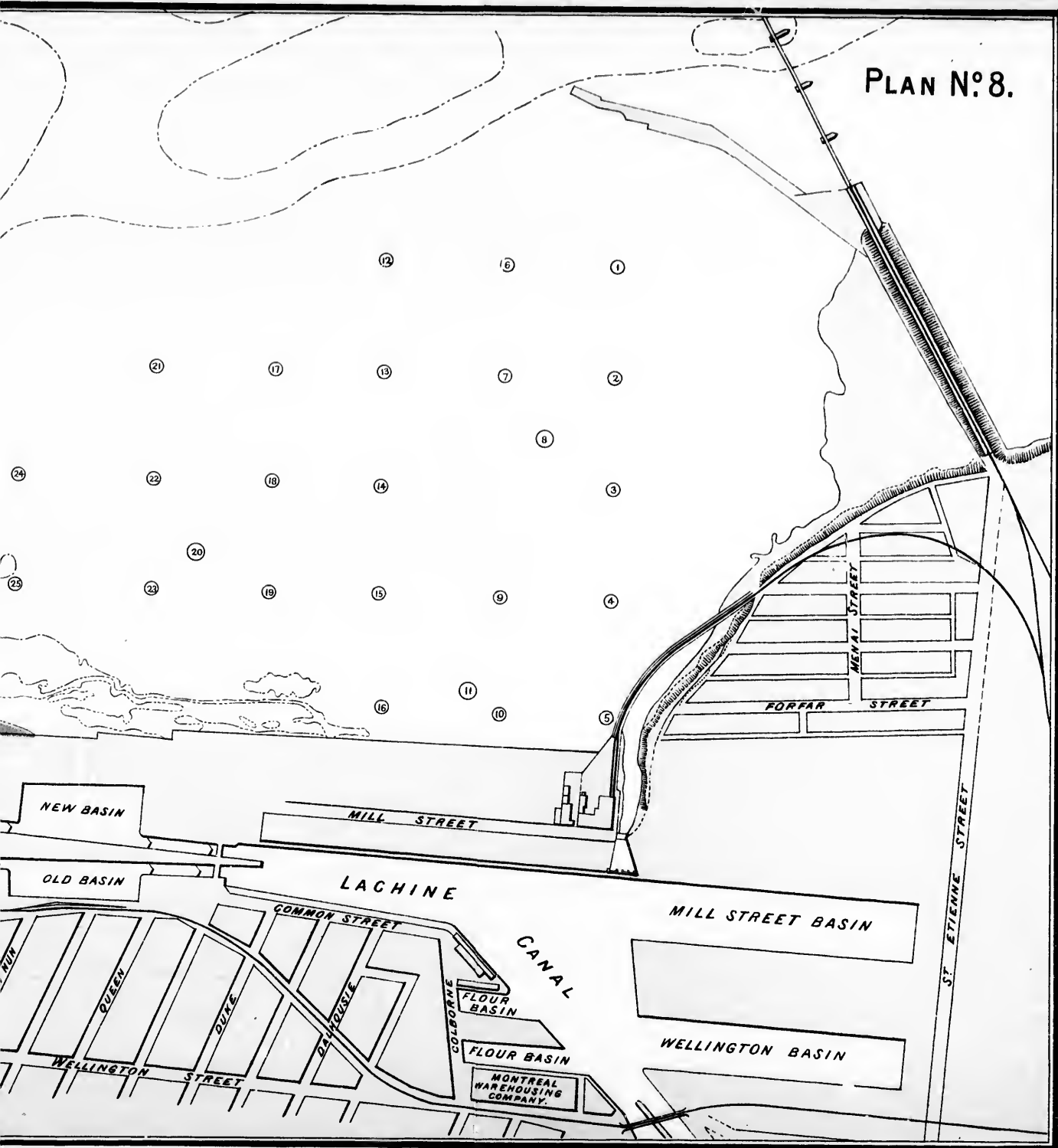


IMPROVEMENT OF MONTREAL HARBOUR,
 PLAN & JOURNAL OF BORES,
 TAKEN IN BED OF RIVER.





PLAN N° 8.



NEW BASIN

OLD BASIN

LACHINE

COMMON STREET

MILL STREET BASIN

CANAL

COLBORNE STREET

FLOUR BASIN

FLOUR BASIN

MONTREAL WAREHOUSING COMPANY

WELLINGTON BASIN

KUP

QUEEN

DUKE

DE LA PEPERIE

WELLINGTON STREET

STREET

MENAI STREET

FORFAR STREET

ST. ETIENNE STREET

21

17

13

7

2

24

22

18

14

8

3

20

23

19

15

9

4

25

16

11

10

5

12

6

1

16

10

5

