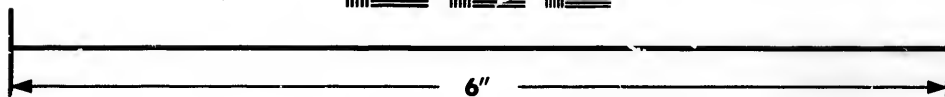
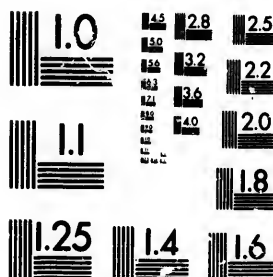


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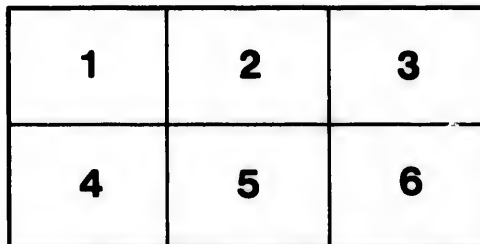
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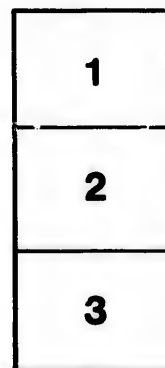
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REPORTS

ON THE

MEANS OF IMPROVING THE PRESENT HARBOUR

AND THE

CONSTRUCTION OF DOCKS AT MONTREAL,

BY JOHN C. TRAUTWINE, Esq., C. E.
OF PHILADELPHIA.

ALSO,

A REPLY TO THE SAME, IN A LETTER ADDRESSED TO
THE HARBOUR COMMISSIONERS,

BY THE HON. JOHN YOUNG.

Montreal:

PRINTED BY JOHN LOVELL, ST. NICHOLAS STREET.
1859.

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LETTER

Of Instructions, signed respectively by the Chairman of the Harbour Commissioners and the Chairman of a Committee of Citizens on Harbour improvement, handed to Mr. TRAUTWINE, on his undertaking the duty of examining into and reporting upon Dock and Harbour accommodation.

MONTREAL, 15th July, 1858.

JOHN C. TRAUTWINE, Esq.,
Civil Engineer.

SIR,—

We have the honor to convey to you the views which the Harbour Commissioners, acting in concert with a Committee of Citizens, have adopted as a guide for you in the investigations which you have undertaken to make on the subject of Harbour improvement and of Dock accommodation in this city.

It may be well to inform you that the citizens have been much divided in opinion upon these questions—especially upon that of Docks; and that two projects have been very prominently before the public—the one favoring Hochelaga Bay and the other Point St. Charles, as a site for Docks.

On the subject of improving and extending the present Harbour, a general desire seems prevalent to accomplish that object, and any difference of opinion which now exists on that point is simply as to the plan to be adopted, and the cost which it may

be prudent to incur. On the subject of Docks, in the course of the discussions which have taken place, a third project was started, indicating a site on the city side of the Lachine Canal, which was considered more easy of access for the business of the city than either Hochelaga Bay or Point St. Charles.

As this site seemed likely to unite conflicting opinions, and found favor to a great extent among the citizens, the Harbour Commissioners invited the proposers of it to a conference, at which several of the citizens were present, and at which the following resolution was agreed to :—" That the following Committee, viz., Wm. Workman, John Redpath, Henry Bulmer, Wm. Parkyns, John Ostell, A. M. Delisle, and Thomas Ryan, be empowered to select an engineer to survey and take the levels of the ground lying between the present Harbour and the north bank of the Lachine Canal and St. Joseph Street, or such part thereof as the Committee may determine on, in order that such levels may be laid by them as soon as possible before a chief engineer or engineers, to be named by said Committee and approved of by the Harbour Commissioners, which engineer or engineers shall ascertain what facilities are afforded on the north or city side of the Lachine Canal for the construction of Docks and Warehouses, and the expense thereof, and shall also confer with the Harbour Commissioners, and the said Committee, as to the extent to which the present Harbour can be improved, and the expense thereof, and shall report upon the whole subject."

In pursuance of this resolution, your name was suggested by the Committee, and was approved of by the Harbour Commissioners, and you will accordingly undertake the duties prescribed in the resolution.

These, you will perceive, are twofold,—

1st, To examine and report upon the site which for convenience we will call the "Central" site for Docks ;

2d, To confer with the Harbour Commissioners and the Committee, and report on the subject of Harbour improvement.

Commencing with the question of Harbour improvement, we beg to hand you sundry reports, plans, estimates, soundings, &c.,

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&c., enumerated in the Appendix attached to this letter. Amongst these you will find a plan marked No. 1, E, and an estimate marked No. 1, F, prepared by Mr. M'Questin on the information derived from the engineer of the Harbour Trust, and the data furnished him by the kindness of the Harbour Commissioners.

After perusal of these papers, maps, &c., and a personal examination of the Harbour, we have to request your opinion as to the manner in which you consider it can best be extended and improved, keeping in view the cost, and the actual as well as prospective requirements of the trade of this port.

Coming to the question of Dock accommodation, the Committee, in order to facilitate your operations, have employed Mr. M'Questin to survey and plot the ground indicated in the foregoing resolution, and to take the levels, which have been checked by Mr. Forsyth, engineer of the Harbour Trust; and we hand you Mr. M'Questin's plan, marked No. 1, G, which comprises the area to which your special investigations will be directed, and the services of Mr. M'Questin and Mr. Forsyth are at your disposal for any explanations or further details you may require from them.

On this plan, and in connexion with the Lachine Canal, you will notice a large extent of land about 28 acres, the property of Government.

If, as it is hoped by the Committee, the Government may be induced to make the proposed Docks a portion of the public works in that vicinity, the cost of construction in that case would not become chargeable on the Harbour, but would be more generally distributed over the general commerce of the country, than if undertaken as a local work.

Two modes of approach for sea-going vessels to the site in question are exhibited on the plan—one through the property of the Grey Nunnery and of the Seminary of Montreal; the other by means of a new lock of increased dimensions connecting the Harbour with the present Canal Basins. But you are requested not to confine your examinations to these approaches alone should any other more eligible occur to you.

The cost of the land by the Grey Nunnery approach will present an item for your serious consideration, independent of any

question of engineering; and on this point of cost full information will be obtained for you.

The important object aimed at by constructing Docks and affording increased Harbour accommodation for large vessels, is to attract to the St. Lawrence route a greater share of the trade of the West than has hitherto passed through that channel; and the facilities to be obtained must be such as will enable lake and sea-going vessels to meet and exchange cargoes with expedition and economy, and such as will also afford sufficient berth room in the Harbour for ocean steamers of the largest capacity and draught, now running to this port.

It will be your duty to examine and report upon the facilities to be afforded within the limits of the accompanying plan and its vicinity, for the construction of Docks upon such a scale as you may deem requisite to ensure the objects already alluded to; bearing in mind that your estimates of the cost must exercise a material influence on the policy to be pursued in the selection of a site for Docks.

In the Appendix you will find included, the reports, plans, &c., &c., of the other sites which have been proposed for Docks, upon which you will make such observations as you may deem necessary or applicable in regard to their comparative merits, and finally, after consideration of the whole subject, give your opinion in writing as to the best course to be pursued for providing Docks and Harbour accommodation.

We are, Sir,

Your obedient Servants,

JOHN YOUNG,

Chairman Harbour Commissioners.

THOMAS RYAN,

Chairman of Committee.

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APPENDIX.

List of Reports, Plans, Estimates, Soundings, Letters, and other documents, handed to Mr. TRAUTWINE, and referred to in the foregoing joint letter of instructions handed to him by the Harbour Commissioners and the Committee on Harbour improvement.

1. Report of Board of Engineers and Provincial Geologist on survey of Lake St. Peter, in October, 1850.
2. Pamphlet relating to the deepening of the ship channel through Lake St. Peter, published February, 1853, with the sanction of the Government.
3. Pamphlet containing a report of the affairs of the Harbour Commissioners in 1854, and the deepening of the ship channel.
4. Letter of THOMAS C. KEEFER, dated 14th January, 1854, to the Commissioners in reference to Harbour improvement.
5. Report of Mr. YOUNG, Chairman of the Harbour Commissioners, on the subject of improving and enlarging the Harbour, dated 29th November, 1853.
6. Letters in pamphlet form to the Chief Commissioner of Public Works, and the Citizens of Montreal, on Canadian trade and the commerce of this city, by Mr. YOUNG, Chairman of the Harbour Trust, dated December, 1855.
7. Letter of Mr. YOUNG, dated 23rd April, 1857, on the improvement of the lake and river navigation, and the construction of a new Harbour.
8. Report of a Board of Engineers appointed to examine and report upon the improvement of the Harbour of Montreal, and the Trade and navigation of the St. Lawrence, 'consisting of Messrs. JOHN CHILDE, W. J. M'ALPINE, and JAMES P. KIRKWOOD, dated 24th March, 1858, with appendix. This report is accompanied by maps and plans, showing sites for Docks at Hochelaga Bay and Point St. Charles.

9. Letter of the Harbour Commissioners to the Provincial Secretary, dated 26th June, 1858, on proposed improvements in the Harbour of Montreal.
10. Resolution of the Board of Trade and their petition to the Legislature, dated 29th June, 1858, in regard to an act to provide for the improvement of the Harbour of Montreal.
11. Letter of Mr. Youns to the Inspector General, dated 5th March 1856, on the enlargement of the Harbour of Montreal.
12. Report of Messrs. Gzowski and KEEFER, Civil Engineers, on the proposed enlargement of the Harbour of Montreal, dated 28th January, 1853.
13. Wilson's review, in pamphlet form, of the Trade and Commerce of Montreal for 1857.
14. The Government returns of Trade and Commerce for 1857.

MEMORANDUM

Submitted to Mr. TRAUTWINE by the Harbour Commissioners of Montreal, showing the Policy by which they have been guided, and which they believe ought to be pursued in providing increased accommodation in the Harbour.

The Port of Montreal is 120 miles nearer the great Interior Lakes than any other port accessible for sea-going vessels of large burthen, and is 300 miles nearer Liverpool than New York is.

The Harbour Commissioners have long been of opinion that the Harbour of Montreal possesses natural advantages for making it the best point for a great "entrepot" for the vast trade of the interior, and where an exchange of cargo between the ocean and the inland vessel can be made more conveniently and at the least cost.

Under this impression, the Commissioners obtained authority from Parliament, to deepen the shoals in Lake St. Peter, which, previous to 1850, were not navigable at low water for vessels drawing more than 11 feet. They succeeded in cutting a channel through these shoals, and have otherwise improved the navigation, so that there is now a channel nowhere of a less width than 300 feet, nor of a less depth at lowest water than 18 feet.

It is proposed to go on improving the navigation between Quebec and Montreal, to adapt it for steamers or sailing-vessels, at the lowest water, drawing 20 feet.

With the channel thus improved, and from the fact that the lowest water seldom extends over a period of five weeks, it is evident that Montreal will then be accessible to vessels of the largest class,

Previous to 1850, when the obstructions to the navigation between Quebec and Montreal existed, the size of vessels coming to

this port seldom exceeded 500 tons; but since the deepening of Lake St. Peter and the improvements in other parts of the river have been made, steamers of 2400 tons, and sailing-vessels of 1200 tons, have come into the harbour.

The improvements therefore of the navigation below Montreal, rendering the port accessible to vessels of a much larger size than formerly, makes it imperatively necessary that increased accommodation should be provided to meet the increased size of the vessels; and the further increase of the trade of this port will partly depend upon the facilities and accommodation which can be afforded. Unless provision can be made for vessels drawing 20 feet at lowest water, it would evidently be useless further to deepen the channel of navigation below Montreal beyond the available channel in the harbour.

With the exception of wharves at Hochelaga Bay, Monarque Street, Victoria Pier, and Bonsecour Basin, the structures in the present harbour were completed in 1843. At that time, the trade of the interior was carried on by small barges, none of which exceeded 100 tons burthen. For such craft, and the small size of the sea-going vessels, the present harbour was sufficient.

In 1848, the St. Lawrence Canals were opened and adapted for vessels of 850 tons. Such vessels, however, cannot proceed beyond Lake Ontario, as the locks on the Welland Canal are only 26 feet wide; but the enlargement of them will open up the navigation from Montreal to the head of Lake Superior for vessels of that size.

The Commissioners therefore have found it necessary since 1843 to extend their wharfrage accommodation, and to make extensive excavations in the harbour, by removing shoals, widening and extending the entrance of the harbour, &c. &c. Since that time, wharves in Bonsecour Basin, Monarque Street, and Hochelaga Bay, also Victoria Pier, have been constructed; and such is the rapid increase in steamers trading with various places adjacent to Montreal, and in the local trade generally, that the Commissioners are now constructing a new wharf 300 feet long (which can hereafter be extended), and 100 feet in breadth, in the Bonsecours Basin, and are also constructing a wharf 1600

feet long below the Victoria Pier, as far down as the Military Hospital.

This will enable them to remove the wood trade from the Bonsecours and Basins above, to the wharves below the Victoria Pier, and to improve and adapt that space between the Grand Trunk wharf for vessels drawing not over 16 feet at low water. The space lying between the Island Wharf and the Victoria Pier will then in no place have a less depth at low water than 12 feet, while about half of the whole space can be fitted up for vessels of 16 feet, without any excessive expenditure; thus affording accommodation for the local trade, for which, from its proximity to the principal market of the city, this part of the harbour has hitherto been, and can most advantageously and conveniently continue to be used; and for vessels of moderate burthen, trading with the Lower Ports and the West Indies, to provide 20 feet of water would in the opinion of the Commissioners entail a useless expenditure of a large sum.

The space above Island Wharf and below the entrance of the Lachine Canal, is the deepest part of our harbour. The wharves have all been constructed by piling. The Commissioners have deepened the most of this space about 4 feet, so that now most of it is adapted for vessels drawing 18 feet at low water, but they cannot further deepen it without running the risk of undermining the present structures. Indeed, it will be extremely difficult and costly further to dredge it, as the bottom is so hard. Late dredging above the Nelson Pier has cost about \$1.50 per cubic yard, while dredging below, seldom exceeds 50 cents. If further deepened, the present piling would have to be fronted by crib-work, and as that would take up at least fifteen feet all round the present basins and wharves, and as the water-space of deep water is already too limited for the large steamers which now occupy these berths, the Commissioners deem it impolitic further to deepen this part of the harbour.

They are of opinion that when 20-foot berths are required in the present harbour, the same can be obtained on the unimproved space below the Victoria Pier, as shown on pier marked A; and when this becomes necessary by the Lake and River below Mont-

real being deepened to 20 feet, the wharf now constructing below the Victoria Pier, in a depth of 10 feet water, can be extended, and the space dredged into deep water. But, although the improvements in the harbour must be extended in the direction of Hochelaga Bay for the local trade of the port, yet there are no conveniences for the transit and foreign trade, nor is it possible to erect warehouses close to the margin of the river without their being endangered by the shoving of the ice in winter. Hence the necessity, if Montreal is to be a place where the ocean vessel is to meet that from the interior, that facilities for receiving and delivering grain and other Western produce should be provided. Vessels from the West are now frequently delayed eight or ten days discharging cargo, and elevators and warehouses corresponding to those at Oswego and Buffalo must be constructed if we are to compete successfully with our rivals for the great Western trade.

The Commissioners have therefore long been of the opinion that Inland Docks are essential to the full development of the advantages of our position, and, with the view of determining the best site for their construction, a question on which there exists great diversity of opinion, and which had excited much sectional feeling, they last year sought the advice of three eminent American engineers, who, acting under the broadest and most liberal instructions, after having investigated the merits of all the sites that had up to that time been suggested, unanimously recommended the enclosing of a part of the river between the abutment of the Victoria Bridge and the entrance to the Lachine Canal. The Commissioners adopted this recommendation, in which they were sustained by a large majority of a very numerous meeting of the Board of Trade of this city. In the course of the discussion that ensued, a new site, one not previously surveyed, was proposed, and was intended to have been brought before a public meeting of citizens in the following resolution, to be moved by Mr. Ryan and seconded by Mr. Workman :—

“That in the present divided state of public opinion on the subject of Docks, and in view of the heavy expense and long

"delay which must attend the construction of those projected at
 "either extremity of the city, it is advisable, before adopting
 "one project or the other, to carry out the improvement of the
 "present harbour to the fullest practicable extent, and also to
 "ascertain without delay whether Docks may not be constructed
 "close to the present Harbour, beginning at or near the site of
 "Grey Nunnery, passing across McGill Street to the College
 "gardens and their vicinity, and thence extending to the La-
 "chine Canal and towards the railway station near Chaboillez
 "Square. As this project will afford ample space for ware-
 "houses, and the accommodation for the exchange of Lake and
 "Ocean cargoes, as well as for laying up vessels in winter,—as
 "its location in the heart of the city will not tend to disturb un-
 "duly the value of property,—as it will secure the formation of
 "branches through town, and the establishment of a central and
 "convenient terminus of the Grand Trunk Railway, and as it is
 "likely to be completed at a less cost and more expeditiously
 "than any other plan before the public, this meeting recommend
 "it to the immediate consideration of the Harbour Commission-
 "ers, and that a Committee consisting of the Mayor and the
 "City Members [names not filled in] be deputed to present the
 "foregoing resolution to the Harbour Commissioners, and to
 "take such further steps as they may deem necessary in further-
 "ance of the objects of the foregoing resolution."

Conceiving that the site here referred to, appeared to offer
 advantages which rendered it worthy of a careful examination
 and comparison with others, and desirous if possible of harmo-
 nizing conflicting interests in the city, the Commissioners invited
 a conference with leading citizens, which resulted in the appoint-
 ment of the Committee of which Mr. Ryan is Chairman, and the
 appointment of Mr. McQuestin to survey the ground and to pre-
 pare data to be submitted to a consulting engineer whom it was
 proposed to call in. The Commissioners regret to find, that this
 site does not, upon examination, afford the facilities of construc-
 tion or the extent of accommodation which its original promoters
 supposed, and they believe they are justified in saying that the
 Committee themselves have practically abandoned it, since the

plan prepared under their direction by Mr. McQuestin does not exhibit any projection of Docks on the Grey Nun and College properties. The limited extent and great value of the land there available, together with the difficulty of connecting the Docks with the present Harbour, and the inconvenience that would flow from the bridging of so many of the leading thoroughfares between the city and the river and canal, are the considerations which may, it is presumed, have weighed with the Committee, as they have with the Commissioners.

The plan now proposed by the Committee, as exhibited in Mr. McQuestin's drawing, viz. that which proposes entering by new locks the Lachine Canal, and connecting by means of that Canal the present Harbours with Docks to be constructed on 20 acres of Government land lying on the north side of the Canal, a little below the St. Gabriel Lock, would, in the opinion of the Commissioners, be exceedingly difficult of execution, besides involving the probable interruption of the navigation of the Canal for one, if not for two years. Nor are these the only objections. The canal is at present crowded by vessels from the interior, and is not large enough for their accommodation. This will be more so when the Western vessels coming through our canals are increased to 850 tons. The want of land around the Canal for increased accommodation for canal vessels, was pointed out to the Government of Canada by Mr. Young, the Chairman of the Harbour Commissioners, in the year 1852, and in 1853 he purchased for the Province about 20 acres of land on the north bank of the Canal, and about 70 acres on the south side. This land is necessary for canal purposes, and will soon be required; but it ought not to be occupied, and it never was intended to be occupied, by ocean vessels.

If Docks could be made on these lands for ocean vessels drawing 20 feet of water, the whole Canal from the entrance would have to be reconstructed, its breadth much increased, and the walls of course newly built. However, the Commissioners have no other object in view than to obtain the best possible site for Inland Docks; but considering the ease with which the Canal could be connected with the river in the space between the Vic-

toria Bridge and the foot of the Lachine Canal ; and considering the great facilities that would arise from having the railway in connection, not only with canal vessels, but with ocean ships, where property such as grain, flour, &c. &c., carried by rail during winter, could be placed in warehouse ready for the ocean ship, and where goods arriving by the latter could be conveniently placed on the rail, there is no point, in the opinion of the Commissioners, so well adapted as this for the construction of Docks.

But these are not the only advantages possessed by this site : a still greater object for the interests of the city and the Province generally, is to render available at this point the advantages of the vast water-power which can so easily be commanded at this point. The advantages of flouring wheat here for export, not only to Europe, but to the United States, must be self-evident, while the revenues from the water-privileges would go towards defraying the interest on cost of Harbour.

Nor should it be forgotten that while all the land at this point already belongs to the Harbour Trust, and that a much larger area is here available than at any other proposed site, the land, be it more or less, that might be required elsewhere, must necessarily be acquired at a very heavy cost.

JOHN YOUNG,
Chairman.

HARBOUR COMMISSIONERS' OFFICE,
Montreal, 20th July 1858.

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REPORT

ON IMPROVING THE PRESENT HARBOR OF MONTREAL

BY JOHN C. TRAUTWINE, CIVIL ENGINEER;

Philadelphia, October 16, 1858.

*To the Hon. John Young, Chairman of the Board of Harbor
Commissioners of Montreal,*

*And to Thomas Ryan, Esq., Chairman of Committee of Citizens
of Montreal on Harbor Improvements :*

GENTLEMEN,—Having at your instigation visited the City of Montreal during the months of July and August of this year, with the view of examining the present Harbor, and of proposing a system for its improvement, I beg leave to lay before you the result of my investigations

My duties also required of me a similar course with regard to the proposed Docks ; and I had hoped to submit to you my reports on both at the same time. Indisposition has prevented me from preparing them at so early a period as I had anticipated ; and that on the Docks being still incomplete, I have judged it advisable to present this on the Harbor by itself ; inasmuch as this branch of the scheme demands an earlier attention than the other.

The necessity for further accommodation for vessels of deep draft than the present harbor affords is actually pressing at this moment ; and inasmuch as many of the inconveniencies to commerce resulting therefrom can be more speedily and more econo-

mically obviated in a great measure by even a partial realization of the harbor improvements than by the docks, I regard the former as of more *immediate* importance than the latter, however inferior it may appear when viewed as a work destined to affect the *future* destiny of Montreal.

Until the year 1851, only vessels of not more than eleven feet draft could at low stages ascend the River St. Lawrence to Montreal, owing to the existence of certain shoals in Lake St. Peter and at a few other points below the city.

But a system of dredging on a grand scale, and performed by very powerful machines, has gradually been so far perfected through those obstacles as to afford at this time an uninterrupted channel of not less than 300 feet in width and 18 feet of low-water depth from the Ocean at the Straits of Bellisle to Montreal a distance of not less than 950 miles.

It is intended to increase its depth to 20 feet; and no effort should be spared to accomplish this as speedily as possible, inasmuch as it is even now required for the steamships which trade between Montreal and Great Britain, and which cannot convey full cargoes for the want of it.

The estimated cost, based upon the experience acquired on the portion which has already been accomplished, is but \$100,000; a very trifling sum when compared with the immense advantages which will accrue from its expenditure; and which leaves no room to doubt that the same enlightened policy which dictated its commencement, will also ensure its final completion to the depth necessary for the full realization of its object.

Among other points at which dredging was necessary in order to secure a low-water depth of 18 feet, was a great portion of the channel along the front of the city itself.

Here the inner edge of the 300 feet of dredged channel width is but about from 400 to 600 feet distant from that bank of the river on which the more commercial portion of the city has its front. Consequently the space comprised between said inner edge of the channel, and the city front has generally a less depth than 18 feet at very low stages of water. And it is this space that constitutes the present harbor, and within which are constructed the

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few piers which at this time exist for the accommodation of ship ping.

These piers were built with reference only to the depth of water which existed at the time.—With the exception of the Victoria and Russell piers, which are formed of cribwork, they consist of a facing of wooden piles, strengthened by land-ties, and backed with earth.

They are but imperfectly adapted by either construction or extent, to meet the requirements which [since the dredging of the channel] have arisen from an increased commerce carried on in sea-going vessels of heavy draft. But as their entire removal, or even an extensive modification of them would be, for a time, attended by serious inconvenience to commerce, besides involving a heavy expense, it becomes expedient so to arrange our plans as not to interfere materially with them at this moment.—But after other piers shall be erected at which the vessels may lie, I conceive that the present piers should be essentially improved, in part at least so as to adapt them to vessels of heavy draft.

In the space between the outlet of the Lachine Canal and the Island Wharf, owing to the hardness of the material which comprises the river bottom, and which is therefore difficult and expensive to dredge, it is the opinion of many citizens that it would not be advisable to attempt any deepening on this section beyond what will give it a uniform depth of 18 feet at low-water, of 17 feet on the mitre-sill of the outlet gates of the Lachine Canal. This can be effected without much expense, inasmuch as the required depth, according to the Harbor Commissioners, already prevails over the greater part of the area referred to.

I concur in this opinion only so far as regards the question of the *proper time* for performing additional work on this part of the harbor; for I do not imagine that the expense of procuring 20 feet depth of water and of wharfage, will be much, if at all, greater on some portions *above* Island Wharf than *below* it.

It is true I have been credibly informed that the cost of dredging above Island Wharf is about three times as great *per cubic yard* as below it. But the *quantity* to be dredged below, in order to secure 20 feet water over a given area, is about three times as

great as that above; so that the dredging will actually cost so nearly the same in both localities that the difference cannot supercede in importance the consideration of convenience to the commerce of the city.

So soon therefore as the River Channel shall be deepened to 20 feet, I recommend that that same depth be at once given to at least whatever berths may be appropriated to the "Montreal Ocean Steamships," and to the small area T P M [see my accompanying plan] near Island Wharf, tinted light blue.

And should the time arrive when further 20 feet water shall be required along the upper side of Albert Pier, and around Elgin Basin, there will exist no consideration of undue expense, [so far as we now know] to prevent its accomplishment.

It will be borne in mind that the soundings shown in my plan are those obtained by Mr. Forsyth's ice-survey in 1855-6, reduced to low water.

Since then a considerable amount of dredging has been done in the harbor above the Island Wharf; but as no more recent survey has been made, I am unable to state the present depths, except on the authority of the Harbor Commissioners, that it has already been pretty generally deepened to 18 feet.

I also recommend, instead of excavating the proposed extension at W, near the outlet of the Lachine Canal, for giving greater accommodation to the "Montreal Ocean Steamships," that a new pier A, 300 feet long, and 70 feet wide, be constructed for their use.

My estimate of the cost of this pier, placed in 20 feet water, is as follows:—

Oribwork, complete, with pier flooring, &c. &c. [stone filling.] 680 feet long; by 20 wide; by 29 high,=14608 cubic yards at \$1.60.....	\$23,373
Filling in between the Cribs with material dredged from the Channel, [being only the expense of removing it from the scows.] 280 feet; by 29; by 30,=9023 cubic yards at 25cts.....	2,256
Dredging under the pier; 300, by 70, by 2,=1556 cubic yards at \$1.50.....	2,334

Removing Nelson Pier,.....	3,000
	<hr/>
Contingencies 10 per cent	\$30,963
	3,096
	<hr/>
Total cost of pier in 20 feet water.....	\$34,059

The estimate of Messrs. Forsyth and Macquisten for excavating the extension at W. to 20 feet water, is (without contingencies) \$27,748; but if we add 10 per cent. for contingencies, it becomes \$30,522, or \$3,537 less than my estimate for the pier.

But to obtain 20 feet water (which must eventually be done) will cost much less at the pier, than if the steamships be berthed alongside of the present face-wharf, and in the recess W.

For dredging 2 feet at the pier I estimate as follows :—60 feet wide on each side of the pier; and 100 feet wide at the end of the pier; and thence leading out to the channel; 4,800 cubic yards at \$1.50, or \$7,200 total cost.

And for the other position, thus :—

60 feet wide alongside the wharf, 3,111 cubic yards, at \$1.50	\$4,666
And for deepening a space for the vessels to turn as they approach the wharf,—say as much more.....	4,666
Wharfing 500 feet lineal (for as the Commissioners justly remark, further deepening will undermine and endanger the old structures) at \$48 per foot.....	\$24,000
	<hr/>

Total.....\$33,332

From which it results that the eventual berthing of the steamships in 20 feet water, after the river channel shall be deepened to that depth, will cost—

At my proposed pier, \$34,059 & \$7,200, or Total.....	\$41,259
Alongside of wharf, \$30,522 & \$33,332, or Total.....	\$63,854

Making a difference of \$22,595 in favor of the pier.

It has also been suggested to provide berths for these steamships by removing Nelson pier, so as to place them partly in Queen's and partly in Sydenham basin.

This will be much more economical than to excavate the extension W, and so long as only 18 feet water may be required, will

be the cheapest method I can think of for accommodating them. But when 20 feet of water shall become necessary, the *additional* expenses will be :

650 feet lineal of wharfage, at \$48.....	\$31,200
Dredging 7000 cubic yards, at \$1.50	10,500
	<hr/>
	\$41 700
Contingencies, 10 per cent.....	4,170

Total.....\$45,870

Or \$4,611 more than the *entire* cost of the pier, with 20 feet wharfage.

Therefore, although this plan will be vastly cheaper than the pier, as a *temporary* arrangement, it becomes the more costly work in the end. Moreover, the pier will be more convenient for the Steamship Company, inasmuch as it will not be liable to the interruptions which are now experienced in discharging cargo on a common thoroughfare. Its land end might be furnished with a gate, which would afford greater security to their property, and protect their passengers from any annoyances.

I consider this a matter of no slight importance in view of the growing passenger business between Montreal and Europe. Every effort should be made to attract to this line passengers from the United States ; and nothing will be more conducive to this end, than to provide them with every facility and convenience.

It is possible that I lay too much stress upon these arguments, and upon the subject to which they refer. If so, the plan of the pier may be rejected in favor of the face-wharf in the two basins, at least as a *temporary* measure.

Should, however, one of the proposed plans of docks, which involves an outlet lock at W, be adopted, both the extension W, and the berths at the face-wharf will become inadmissible, as the steamships would, in either case, obstruct the entrance to the lock.

At the Island Wharf no change has, I believe, been proposed ; but inasmuch as the outer faces of that structure are now in a ruined and precarious condition, threatening its destruction unless speedily repaired, I propose that it be *immediately* protected by an outer cribwork, 20 feet wide, and in 20 feet water, as shown in my plan from S to M, by S m T g.

This crib-work will not only effect that object, and thus render secure and more commodious a very important wharf, but will also furnish the most ready means that suggests itself to me for providing an excellent berth for the new line of "Canadian Ocean Steamships" expected to go into operation next year.

The securing of satisfactory accommodations for this class of vessels at the earliest possible period, appears to me to be the most urgent of all the considerations involved in the question of your harbour improvements, *so far as regards the necessity for prompt action*. I am, therefore, pleased to be able to suggest a means of effecting this, in the present instance, by a process imperatively required for another purpose. The twofold importance of the work, and its consequent economy, induce me to press it upon your notice as deserving of your earliest attention.

The extension of this crib-work around the other faces of the wharf, and of the Albert pier, and into deeper water than it has at present, may become expedient in time; but it is not called for at this moment.

The two principal faces of the improved wharf, namely m T, and T g, will afford at once 540 feet of wharfage in 20 feet water without the necessity for losing time in dredging more than the very small area T P M, and for levelling off a narrow strip of a bout 20 feet in width around the old wharf, for the bases of the cribs to rest on.

I estimate the cost of the improvement as follows:—

Crib work around the head of the old wharf, from S to g, complete, filled and floored, 695 by 20 ft.; by 26 ft. average height; 13,400 cub. yds. at \$1.60.....	\$21,440
Filling-in with earth behind the cribs; 5,665 cubic yards, at 40 cents.....	2,266
Dredging to 20 feet, the small space T M P; 1500 cubic yards, at \$1.50.....	2,250
Levelling narrow strip around old wharf for cribs to rest on; say 2000 cubic yards, at \$1.50.....	3,000
	<hr/>
	\$28,956
Contingencies, 10 per cent	2,896
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Total.....	\$31,852

As already remarked, the dredging of T P M may be deferred until the completion of the channel to 20 feet depth.

Much diversity of opinion exists as to the proper disposition of the space between King's basin and the Victoria Pier.

The question is one of much importance, since this space is in immediate proximity to an expensive system of warehouses, the value of which is dependent in a great measure upon a judicious arrangement of this portion of the harbor.

Whatever temporary expedients therefore may be resorted to in any part of it, none should be permitted that will interfere with an *eventual* deepening of at least the area between piers B and E (see plan) to 20 feet at low water. Several years may elapse before the necessity for doing this may be fully realized; but inasmuch as the portion of the natural harbor lying above Victoria Pier is undoubtedly the legitimate centre of the city's foreign commerce, rendered so not only by locality, but by the large sums which have been expended in its vicinity with a view to the accommodation of that commerce, I consider it good policy to strengthen that position by arranging our plans in conformity with it.

As the commerce of Montreal increases in after years, the gradual improvement of the natural harbor and of the city front must *necessarily* extend down the river below Victoria Pier; but I consider it inexpedient (without any commensurate object) to *force* them down at this time below the fine warehouses, so admirably adapted to that amount of local trade which must prevail for several years to come: and for the perfect convenience of which nothing is wanting but additional piers above Victoria Pier. In other words, the new piers should be built with reference to the present warehouses; and by no means should we necessitate the building of new warehouses with reference to the new piers.

I therefore recommend that the *gradual* deepening to 20 feet be resolved on for the space between piers B and E of my plan; and that all the new piers be designed so as to accommodate the greatest possible amount of shipping. Fortunately the material over this entire area is easy of removal; while at the same time it possesses sufficient consistency to prevent its being acted upon by the river currents.

The arrangement of the four piers B, C, D and E, shown on my plan, is the one which I recommend for adoption. It appears to me (after a trial of many modifications,) to unite as nearly as may be, the maximum of wharfage and convenience, with the minimum of expense.

It is essentially the same as that suggested by Mr. Tate, C.E., of Montreal; and after bestowing much consideration upon it, I find myself unable to devise a better.

Should any of these piers be constructed where 20 feet of water may not be required *at the time*, they should, nevertheless, be sunk to that depth, in view of the future necessity for it.

I recommend to construct first the pier C in Prince's Basin, and to dredge to 20 feet for 100 feet in width on each side of it, as shown by the blue shaded lines P ss and L aa. By this means we gain 900 feet lineal of 20 feet wharfage, at the following expense:—

950 feet lineal of crib-work, filled and floored complete, 20 feet wide by 29 feet high—20,408 cubic yards, at \$1.60.....	\$32,653
Dredging 460 ft. by 275 ft. by 7 ft.—32,800 cubic yards, at 50 cts.	13,400
Filling in between the cribs <i>with dredged material</i> —16,917 cubic yards, at 20 cents.....	3,384
Filling up the space Y <i>with dredged material</i> —2,200 cubic yards, at 20 cents.....	440
	<hr/> \$52,877
Contingencies, 10 per cent.....	5,288
Total.....	<hr/> \$58,165

Adding to this the improvement as the end of Island Wharf, we have 1,440 lineal feet of 20 feet wharfage, at a cost of \$90,017 or \$61, 51-100 per lineal foot.

When more 20 feet wharfage than this shall be required, it will be economically obtained by wharfing R N T, and by completing the dredging of the space N P Q R (tinted light blue).

After that, piers D and E may be built in succession. It will be observed that here the dredging, even at the rate of 50 cents per cubic yard, is an item of much less expense than the piers. Above Island Wharf, with a width of 100 feet on each side of a pier, it is the same case.

Instead of filling up Jacques Cartier Basin, I would leave it with a depth of at least 6 feet, for the accommodation of small boats. This is shaded dark blue on the plan.

I object to the Pier LL, which it has been proposed to extend down stream from the outer end of Victoria Pier, (and intended for the accommodation of steamships and other large sea-going vessels) for the following reasons :—

1st, Its proximity to the new wharves for wood and hay below Victoria Pier would expose valuable vessels to great danger from fire.

2nd. It is not so convenient to business as Pier C, or any other above Victoria Pier.

3rd. It has not, as is generally supposed, even the consideration of economy to recommend it.

4th. It injures the uniformity of appearance of the general system of improvement which I propose for the present harbor.

The first three of these reasons I consider very cogent ones ; the fourth is of but little weight, referring as it does merely to a matter of taste.

I estimate the cost of Pier LL, as follows, regarding it only as a simple pier 600 feet long, and 100 feet wide, and without including the proposed alteration of the end of Victoria Pier, which would increase its cost materially :—

Cribwork, filled and floored complete, 1260 feet long by 26 feet wide, and 29 feet high = 27,070 cubic yards at \$1.60....	\$43,312
Filling in between the cribs with dredged material, 580 feet long by 60 wide, by 28 deep = 36,100 cub. yds, at 20 cts.	7,220
Dredging to 20 feet deep between the outer side of the pier and the dredged channel, 9,800 cubic yards, at 40 cts.....	3,920
Dredging along the inner side of the pier to a width of 100 feet, and a depth of 20 feet—say 800 feet, by 100 feet, by 2 feet = 24,000 cubic yards, at 40 cts.....	9,600
Dredging under the pier, 11,560 cubic yards, at 40 cents.....	4,624
Cribwork K, 100 feet long, by 20 wide, by 29 high, 2,148 cub. yards, at \$1.60.....	3,437
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	\$72,113
Contingencies, 10 per cent.....	7,211
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Total.....	79,324
—or \$66 10-100 per lineal foot of wharfage.	

Hence it appears that the cost per foot lineal of 20 feet wharfage at the pier LL, below Victoria Pier, is actually \$3 59-100 more than at my proposed locations at pier C, and at Island Wharf:

But when we take into consideration that a great portion of the expenditure at Island Wharf will necessarily have to be made without any regard to obtaining increased wharfage, it is evident that the disparity of cost becomes still more in favor of my proposition. Add to these facts, the freedom from danger by fire, and the greater convenience to business, and I can see no ground for a moment's hesitation between the two propositions.

So long as the Bonsecours Market continues to be devoted to its present purpose, it will be useless to incur expenditure for increasing the depth of the basin in front of it (namely Bonsecours and Market Basins) to more than 12 feet, which is the depth proposed for them by the Harbor Commissioners: inasmuch as that is sufficient for the market boats, and for those river steamboats, to the use of which those basins are necessarily appropriated.

Should the new Bonsecours Pier become over-crowded in time, additional accommodation for these small craft may be economically furnished by building pier F, 400 feet long.

Indeed, independently of all contingencies affecting the permanence of the market, it appears to me as well, under any circumstances, to reserve those basins for the numerous vessels of light draft which trade to the city:—and to go below Victoria Pier when the necessity shall arise for more deep water wharfage than what I have proposed.

By this means we shall effect a more equable distribution of the several depths of harbor room along the whole city front; thus enabling each portion of the population to avail itself of the facilities resulting from all.

As to the proper system for adoption below Victoria Pier, I conceive that the best course would be to await the result of time for determining its details; meanwhile merely forbidding the execution of any structure that can ultimately interfere with the carrying out of a uniform series of face-wharves and piers, for the distance of, at least the $1\frac{1}{2}$ miles down to the lower boundary of the city.

No one can foretell with any certainty at what time, or to what extent further improvements in the present harbor will be required. All is mere conjecture. Everything will depend upon the adoption or rejection of a system of docks. But in either event, the necessity for at least as much improvement as I have proposed for *immediate execution*, will probably be conceded by most persons.

Even in the probable event of the construction of docks, vessels of heavy draft will arrive with cargoes that will not require to avail themselves of that improvement while unloading; but which can, which much greater advantage, be discharged directly into the present warehouses immediately adjacent to the 20 feet warfage which I propose; and proceed afterwards to the docks to receive their return cargo. It therefore, in my opinion, becomes expedient under any possible circumstances, to provide sufficient 20 feet harbor room close to these stores, not to *compel* all vessels of deep draft to discharge at the docks, and thus incur the expense of cartage back to the warehouses.

The cost of the improvements which I suggest for immediate execution, will not exceed about 6 per cent, of that of the cheapest system of docks that I can devise; or about 3 per cent. of that of others which have been proposed:—and it can be carried into effect, and rendered most essentially useful to the city, in much less time than any of them.

The action of the Harbor Commissioners in providing an extensive face-wharf with 10 feet water below, and adjacent to Victoria Pier, for the wood and hay vessels which have hitherto occupied the valuable space above that pier, is in the highest degree judicious. Should their further removal down stream be demanded in time to come, that wharf will not interfere with the building of another in deeper water if necessary,

With regard to the *method of constructing* the harbor piers as now employed by the Commissioners, (and of which their engineer Mr. Forsyth, presented me a drawing in detail,) I consider it susceptible of no material improvement, in consideration of the tremendous force of the shoving ice at Montreal, so peculiar to that locality. This destructive agent renders the employment of stone face-walls on top of the cribs above low-water, entirely in-

admissible, except at enormous cost. Mr. Forsyth's recent modifications of the old plan of building the cribs are very important, as well as very creditable to him. I would, however, suggest that I consider 20 feet a sufficient thickness for the cribs, even in 20 feet water; and their reduction to that size will materially diminish their cost.

I have thus endeavored to state concisely my views respecting the improvement of the present harbor. I have bestowed much attention upon the subject, having sketched and estimated many modifications which suggested themselves, but have found none which fulfils so perfectly all the requirements of the case as that which is here submitted to you.

The necessity for a strict economy has been kept prominently in view. I suspect that my estimates will be admitted to be liberal, being based upon prices which have been found to be ample for similar work at Montreal.

I have suggested nothing for *immediate* execution, except what I regard as imperatively required. The remaining portions are susceptible of being carried out by small increments, as the exigencies of the period may demand, and at the minimum of expense. All that I have proposed to be done at present (aside from the wood and hay wharves), as sufficient for at least a short time to come, is as follows:—

The pier for the Montreal Ocean Steamships.....	\$34,059
Protecting Island Wharf and rendering 540 feet of it available as 20 feet wharfage.....	31,852
Building pier C, giving 900 feet of 20 feet wharfage.....	58,165
Total	\$124,076

The first of these may very properly be delayed untill the completion of the other two.

I have not spoken of a branch railway for connecting the piers with the Grand Trunk, because, although such a branch would greatly add to the facilities of business, still it is not *essential* to the scheme of harbor improvement at this time.

In conclusion, I beg leave to express my sense of the courtesy of many citizens of Montreal who freely communicated to me their

several views respecting the requirements of commerce as connected with the harbor improvements. Their opinions have aided me very essentially in preparing my plan.

To the Harbor Commissioners, through their Engineer, Mr. Robert Forsyth, I am under especial obligations for most important information, which I could not have derived from any other source. The prices which I have used in my estimates were obtained from Mr. Forsyth as the result of his experience in Montreal.

Hoping sincerely that my plan may tend to reconcile the conflicting opinions hitherto entertained on this important subject, and that any accidental inadvertencies which may be detected in my Report may be freely communicated to me for rectification,

I am, Gentlemen,

With high respect,

Your most obd't serv't,

JOHN C. TRAUTWINE.

Philadelphia, October 16th, 1858.

APPENDIX

TO REPORT ON PRESENT HARBOUR.

To Hon. John Young, Chairman of the Board of Harbour Commissioners of Montreal, Thomas Ryan, Esq., Chairman of Committee of Citizens of Montreal on Harbour Improvements.

GENTLEMEN,—My Report of October last, on the Improvements of the present Harbour in Montreal, contained estimates for only so much construction as I supposed would be entered upon immediately. I now submit estimates for the remainder, as an Appendix to the Report :—

ESTIMATE FOR PIER B, AND WHARFING FROM B TO C.

Cribs of Pier, complete, filled, and floored. 760 ft. long, 20 wide, 29 high ; 16,370 cub. yds., at \$1.60.....	\$26,192
Filling in between the cribs with dredged material. 360 ft. long, by 35 wide, by 28 high ; 13,070 cub. yds., at 20 cts.	2,614
Wharfing from B to C. 230 lineal ft., at \$48.....	11,040
Dredging from a line <i>above</i> Pier B ; downstream, so as to include the remainder (that is to say, the portion not estimated in the Report) of the Basin between B and C. 260 ft., by 350, by 9 ; 30,333 cub. yds., at 50 cts.....	15,167
Filling two small Basins now existing. 3,300 cub. yds., at 20 cts.....	660
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	\$55,673
Contingencies, 10 per cent.....	5,567
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Total	\$61,240
Or 940 ft. lineal of Wharfage, at \$65 ¹⁰ / ₁₀₀ per foot (in 20 feet water).	

ESTIMATE FOR PIER D, AND WHARFING FROM C TO D.

Cribs of Pier, complete, filled, and floored. 650 ft., by 20, by 29 ; 13,963 cub. yds., at \$1.60	\$22,341
Filling in the Pier between the Cribs with dredged material. 300 ft., by 35, by 28 ; 10,888 cub. yds., at 20 cts.....	2,178

Wharfing R, N, T. 640 ft. lineal, at \$48.....	30,720
Dredging remainder of Basin between C and D; and downstream to a line half-way between D and E. 32,000 cub. yds., at 50 cts.....	16,000
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	\$71,239
Contingencies, 10 per cent.....	7,124
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Total.....	\$78,363
Or 1250 feet of Wharfing, at \$62 $\frac{10}{100}$ per foot (in 20 ft. water).	

ESTIMATE FOR PIER E, AND FOR WHARFING THE OUTER END
AND PART OF THE LOWER SIDE OF JACQUES CARTIER PIER.

Cribs of Pier, complete, filled, and floored. 910 ft. long, by 20, by 29; 19,548 cub. yds., at \$1.60.....	\$31,277
Filling between Cribs with dredged material. 500 ft., by 35, by 28; 18,148 cub. yds., at 20 cts.....	3,630
Dredging from half-way between D and E, down to 70 ft. below Pier E. 27,800 cub. yds., at 50 cts.....	13,900
Wharfing 170 lineal ft., at \$48.....	8,160
	<hr/>
	\$56,967
Contingencies, 10 per cent.....	5,697
	<hr/>

Total..... \$62,664
Or 1040 ft. of 20 ft. Wharfage, at \$60 $\frac{10}{100}$.

The estimate for the Pier for the Montreal Ocean Steamships; for improving the outer faces of Island Wharf, and for Pier C, was set down in my Report at \$124,076.

The three estimates contained in this Appendix, amount to \$202,267; making a total of \$326,343.

For this sum of \$326,343, we obtain ample Wharfage in 20 feet water, for 36 One Thousand Ton Sailing Ships; leaving Elgin and Metcalf Basins with their present about 18 feet water; and Kings, Market, and Bonsecours Basins, with their still more moderate depths, for market boats and river steamboats.

I am, Gentlemen,

With high respect,

Your obdt. servant,

JOHN C. TRAUTWINE.

PHILADELPHIA, NOV. 3, 1858.

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REPORT

ON

DOCKS FOR THE CITY OF MONTREAL.

BY JOHN C. TRAUTWINE, CIVIL ENGINEER.

PHILADELPHIA, October, 1858.

To Hon. John Young, Chairman of the Board of Harbour Commissioners of Montreal :

AND

To Thomas Ryan, Esq., Chairman of Committee of Citizens of Montreal on Harbour Improvements :

GENTLEMEN,—In entering upon an investigation of this important subject, I found myself much embarrassed by the singular discrepancy of opinions entertained with relation to it by the citizens of Montreal, and others conversant with the commercial requirements of Canada : as well as by the entire absence of everything like definite calculation of the pecuniary results which might be expected to follow the construction of a system of Docks.

Many, well qualified, by long commercial experience and by habits of close observation, to form reliable opinions in the matter contend that the future prosperity of Montreal is inseparably connected with the construction of Docks on a capacious scale : while others, equally prepared by the same qualifications to advance sound arguments, maintain that they will prove positively detrimental to it.

A third class regard the Docks as an experiment, the success or failure of which depends upon future developments, the nature and extent of which they consider, at best, uncertain. These are willing that the experiment should be tried on a small scale, and on a system susceptible of gradual extension, should it become necessary; but they object to the primary expenditure of a large amount of money in at once projecting a grand project, which after all, may fail to realize the anticipations of its advocates.

The following are the principle arguments employed by the advocates of Docks :—

Among the most important branches of the commerce of north America is that arising from the exportation of the rich agricultural products of the immense region belonging to the United States and to Great Britain tributary to those inland seas known as our "five great lakes."

These lakes have their outlet to the Ocean through the magnificent River St. Lawrence; and Montreal is, and must remain the head of deep water navigation on that river, from the fact that at that point commence the formidable rapids of the St. Lawrence, the subjugation of which to the purposes of ship navigation defies human effort.

Hence, they say, Montreal is by nature destined to be the point at which the smaller craft adapted to the navigation of the lakes and of the Canada canals, and in which this produce is originally shipped, must transfer their cargoes to the large sea-going vessels by which it is transported to foreign countries,

Therefore, they add, give to Montreal an extensive system of Docks, furnished with all the modern appliances of machinery essential to the most rapid and economical transfer of cargo from vessel to vessel, and she will at once attract to herself the great bulk of the export business of Western produce; and put an end to that monopoly of it now enjoyed by Buffalo and Oswego.

The Western grain and flour which reach the Northern Atlantic seaboard by way of those two cities, incur the expensive charges of long lines of artificial communications. By way of Buffalo, they encounter 353 miles of the Erie Canal;—and by

way of Oswego, 202 miles of the same, besides 28 miles of the Welland Canal : whereas by way of Montreal, their entire passage from the extreme western termination of the great lakes to the foreign seaport to which they may be consigned, is through that cheapest of all means of transportation *a natural watercourse*, interrupted by only 69 miles of artificial navigation through the Welland, and the capacious St. Lawrence Canals.

When the Welland Canal locks, now only 26 feet wide, shall be enlarged to the same dimensions as those on the St. Lawrence canals [45 feet wide], vessels of 600 to 700 tons can ply between Chicago and Montreal.

Those excellent authorities, Messrs. 'Childe, McAlpine, and Kirkwood estimate that when this is done, the cost of carrying flour from Chicago to Montreal will be \$1, 68 per ton [or about 17 cents per barrel], less than from Chicago to New York by way of Oswego, the Erie Canal, and the Hudson River. And that even in the event of the construction of the Caughnawaga Canal, connecting Lake Champlain with the river St. Lawrence a few miles above Montreal, and of the corresponding enlargement of the Champlain Canal, there will still remain a difference of cost in favor of Montreal of 98 cents a ton, or about 10 cents a barrel.

Assuming the cost of transportation to Montreal by way of the enlarged Welland Canal, to be 17 cents a barrel less than to New York, it is believed that a still further reduction of say 3 or 4 cents per barrel may be effected in the present charges at Montreal, by the saving of cartage and by the greater economy of transferring cargo by means of stationary elevators, worked by the surplus water of the docks.

Incidental to this attraction of the Western produce to Montreal, the dock advocates urge that there will also arise a remunerative revenue to the *Province*, from tolls on the St. Lawrence Canals.

These consist of a series of detached works for surmounting the formidable rapids of that river. Their united lengths amount to 41 miles. Having 10 feet depth of canal, and 9 feet over the mitre-sill, they, together with the Welland, all admit vessels of

8 to 8½ feet draught and all except the Welland, have locks of 45 by 200 clear in the chamber.

The construction of the 69 miles of both these canals cost the Provincial Government \$18,800,000;—and they entail upon it an annual loss of about \$1,000,000. Any project therefore which may tend to diminish this yearly drain on the government treasury, deserves commendation and support.

In connection with docks [it is contemplated to erect mills for grinding the Western grain before final shipment abroad;—and convenient for removing the flour directly from the mills to the vessels without carting. These will be driven by the surplus water from the docks, the rental of which for the purpose will, it is said, become a source of revenue, and thereby conduce to a reduction of port charges: besides furnishing employment to many of the laboring population of Montreal. Moreover, flour manufactured at Montreal for foreign shipment does not require inspection, and re-cooperage, like that arriving from the west, and subject to injury in the passage:—thus effecting a further reduction of 2½ cents per barrel.

Large store-houses are also proposed to be erected along the docks, for the storage of such produce as may happen to be detained by the absence of sea-going vessels at the time of its arrival at Montreal, or from other causes.

Another, and a strong argument in favor of docks is derived from the fact that in winter, Montreal is subject to the action of a peculiar local phenomenon called the "shoving of the ice"; by which immense fields of floating ice are swept with irresistible force upon the front of the city, and occasionally piled up to a height of 46 feet above low water mark; covering the elevated river street with its masses to a depth of 25 feet.

Consequently no vessels can remain in the port during winter, but all [except a few which obtain shelter in the basins of the Lachine Canal] are forced to leave;—and those belonging to Montreal take refuge until spring in safe bays below; frequently to the great inconvenience of their owners. The docks will permit these and other vessels to remain; and if necessary to repair during winter in safety. They will also afford facilities for ship building.

The Hon. John Young has shown that the total exports of loose grain and flour from the Lake region towards the East, is approximately equivalent to a bulk of 12,000,000 [twelve millions] of barrels annually;—of which Montreal receives about 8 per cent or 1,000,000. Of these she retains about one third part; and sends two thirds down the St. Lawrence; a portion of it to Europe, and the remainder for consumption at points along the river, and in adjacent districts.

The same authentic source inform us that Montreal is 120 miles nearer to the five great Lakes than New York is;—and that Chicago is 480 miles nearer to Liverpool, by way of Montreal, than by way of Oswego and New York;—also, that from Montreal to Liverpool by way of the Straits of Belle Isle is but 2,682 miles; while from New York to Liverpool is 2,980 miles; giving a difference of 300 miles in favor of Montreal.

The "Montreal Ocean Steamships" average quicker trips than do those which ply between New York and Liverpool: and on this fact is predicated the very rational belief that if sufficient motives are afforded by Montreal to induce the forwarding of larger amounts of grain to her port, a corresponding increase of steamship intercourse between Europe and Montreal will be the necessary result, inasmuch as these vessels may bring over many of the European emigrants which now take the route by New York: thus obviating to a limited extent the objections which now exist against vessels coming to Montreal in ballast. Emigrants can be forwarded to their Western destinations more cheaply and more expeditiously from Montreal, than from New York.

Finally, the construction of docks will afford an easy means of transferring westward bound freight to the Grand Trunk Railway; or of receiving from it such as is destined to descend the St. Lawrence.

The foregoing are the principal arguments adduced in support of Docks.

Now this idea of making Montreal the great transfer point of Western produce from Lake craft to sea-going vessels;—and the basing of the suggestion upon the firm broad ground of the almost uninterrupted natural water-course from the very head of

our great Lakes to Europe, are grand and comprehensive conceptions;—and the plausible minor arguments by which they are sustained, are calculated to excite our admiration, and to enlist our sympathies strongly in the cause. At first sight the position appears to be impregnable; our judgment is taken by surprise, and we are disposed to acquiesce in the assumption without cavil.

But unfortunately there exist very cogent counter-arguments which if they do not entirely refute and invalidate the foregoing reasonings, at least tend materially to diminish their force, and to suggest doubts respecting the practical results of their realization.

We will briefly allude to some of the more important of these antagonistic views.

The most formidable perhaps is the opinion entertained by many gentlemen of high commercial experience and observation, that even in the event that Western produce should arrive in large quantities at Montreal, it would be impossible to induce sea-going vessels to ascend the St Lawrence to receive it. The exports of purely agricultural countries always greatly exceed their imports in bulk or tonnage; usually in the proportion of 3 or 4 to 1. Foreign vessels therefore going to Montreal for this supposed accumulation of Western produce, must go *in ballast*; thus losing as it were, one half their voyage;—whereas if they go to New York for that same produce, they can carry into that port a cargo which will be pretty sure of meeting a ready sale.

This consideration therefore must weigh more heavily with the Western producer, than that of a reduction of a few cents per barrel in the charges which he may have to pay to reach the more accessible sea-port; and must prompt him to prefer the other.

If this argument be correct, [and it certainly appears to me to be entirely irrefutable] then the export tonnage of Montreal must in a great measure be limited by that of her imports; and cannot be expected to augment in any greater ratio than they do. But as the population of Canada is rapidly increasing, and the demand for imported articles becoming proportionally greater, all precedent sustains us in the assumption that the exports will at least keep pace with them, although a considerable time may elapse before they will warrant any heavy expenditure for docks.

With this more moderate view of the subject, many commercial gentlemen of Montreal object entirely to the construction of docks, as being merely calculated to impede her commerce, by an increase of port charges; while others would, perhaps, assent to a trial on a small scale, inasmuch as it would certainly be attended by many conveniences, which, although entirely secondary to that of making Montreal the great point of transfer, would in their opinion justify the belief that small docks might become remunerative. Thus, the facilities for repairing vessels;—the securing of an easy connection with the Grand Trunk Railway by a very short branch;—the furnishing of winter shelter for vessels, &c., &c., are urged in their favor by this class; but they admit that in the absence of all positive and reliable calculations, their ideas are altogether conjectural.

Again it is urged against docks, that there is no special reason why the Lake propellers should not pass through the outlet lock of the Lachine Canal at Montreal, and continue their voyage down the St. Lawrence to Quebec, there to meet the sea-going vessels; instead of requiring the latter to ascend the river to Montreal to meet the former. It is true that neat calculations have been made, which seem to show a slight preponderance, on the score of economy, in favor of one large steam-vessel going up and down; over two of half her tonnage going down and up. But the difference would actually be too trivial to constitute in itself much more than a theoretical argument in favor of docks at Montreal.

Moreover, many contend that instead of constructing docks, at an expense of some millions of dollars, into which large sea-going vessels shall ascend to meet the lake craft, it would be better to improve the present harbor, at a cost of some hundreds of thousands, for the accommodation of the latter; and to let the lake craft descend to them through the present commodious locks of the Lachine Canal, and transfer their cargoes by means of floating elevators, and the usual appliances.

To this course it is objected with truth, that the transfer of cargo could not be effected so rapidly as in the docks. But this argument is met by the rebutting one, that the interest on the cost of the docks, together with the expense of working and repairs,

would far outweigh, not only this difference, but all other considerations involved in their supposed superiority over the present harbor.

Again the completion of the Victoria Bridge, for carrying the Grand Trunk Railway across the River St. Lawrence at Montreal, will open to that railway an uninterrupted line from Canada West to the seaport of Portland in Maine, and to Quebec. The effect which this road has already produced upon the Lake craft driving many of them out of the business of transporting Western produce to Montreal for foreign shipment, gives every reason to suspect that when the Victoria Bridge shall relieve the Company from the necessity under which it now labors, of placing their freight in barges, and towing it across the river, a much greater proportion of Western produce will be carried by it past Montreal to Portland and Quebec; perhaps so much more as to retain Montreal nearly in her present condition, or at least to prevent her rapid increase in her commerce which many predict. Such of it as is put upon the Railway at points westward from Montreal, and destined for shipment to Europe by way of the St. Lawrence, will certainly not stop in Montreal, when in a few hours it can be carried to Quebec, 180 miles farther.

There will, of course, be partial exceptions to this rule, in favor of such regular traders to Montreal as depend essentially upon return cargoes of this character; but it is the determination of the Railway Company to maintain such low rates from Montreal to Quebec, as will in connection with the advantages of more rapid transport, the saving of lake and river insurance, and cost of towage, materially check the assumed monopoly of Montreal in the produce business.

Another argument against the possibility of securing this monopoly, is the fact that, the harbors of New York and Portland are open and accessible during the entire year, while that of Montreal is annually closed by ice for five months. Constancy and regularity are rapidly becoming more essential features in the transaction of heavy commercial operations between distant countries, and neutralize to a great extent the advantages which attach to long water communications subject to so serious a drawback as an en-

tire suspension of business for five months annually. The business connections which must necessarily concentrate upon New York and Portland the great bulk of Western commerce during nearly one-half of the year, cannot be suspended and renewed periodically in favor of Montreal during the other half.

Again, admitting that the enlargement of the Welland Canal should enable Western produce to reach Montreal, and there be shipped at a cost of some 20 cent per barrel less than at New York, the question arises whether it cannot be carried from New York to Europe at so much less expense than from Montreal, as to countervail this advantage. The high rates of insurance incident to the navigation of the River and Gulf of St. Lawrence; and the expenses of pilotage and towage on the river, combine, with other causes, to raise the charge on the freight of a barrel of flour, to Liverpool, to 25 or 35 cents more from Montreal than from New York:—and so long as the bulk of exports shall exceed that of imports into Canada by 300 or 500 per cent, there is no assignable reason, that I can suggest, why this disparity should cease.

Should the foregoing arguments prove insufficient to demonstrate the inexpediency of embarking in an extensive scheme of docks, it may be added that the State of New York, sooner than submit to the diversion of this branch of her exports, and permit it to seek Canadian channels, would, doubtless choose the least of two evils, and reduce her canal tolls to such an extent as to paralyze all efforts to that effect.

Having thus referred to the most prominent arguments both for, and against docks, we come to the important question "*will docks pay?*" To arrive at some tangible idea on this point, we will, in the absence of positive data, make certain assumptions.

Let us assume, therefore, that the enlargement of the Welland Canal locks will be effected; —and that by this means Western flour and loose grain may (as shown by Messrs. Childe, Kirkwood, and McAlpine,) be brought to Montreal at 17 cents per barrel of bulk, less than it can to New York by way of Oswego. Also, that of the entire quantity of these articles, now exported to foreign countries from our northeastern ports, namely, about one third of all that is sent eastward to them or to Montreal, (or say a bulk

equal to four millions of barrels annually) Montreal shall secure to herself the shipping of two thirds, or a bulk equal to 2,666,666 barrels. This is, at least, 2,000,000 more than she now sends down the St. Lawrence. She cannot expect to receive much of the *non-exported* eight millions of barrels, because they are required chiefly for local consumption along their line of transportation; and in districts more accessible from New York than from Montreal. And even in case the *entire* 4,000,000 of barrels exported should pass through the latter city, I think we may assign the excess over 2,666,666 barrels to the Grand Trunk;—so that the docks could not, under any circumstances, be expected to receive a greater proportion than what I have assigned to them;—especially if the Caughnawaga Canal project ever be carried in effect.

Next let us assume that the docks will be built by either the City of Montreal, or by a Company; the revenue in either case to be derived from the export shipment of grain and flour; and from the shipment of westward bound return cargoes up the canal;—leaving the mills, stores, graving-docks, &c., to pay the interests on their several respective costs. We have, I believe, no general precedent to authorise the supposition that they will do more.

Now, of the various plans of docks, which have been submitted, one class will cost no less than \$3,000,000 (three millions of dollars);—and the other about \$1,650,000—omitting in both cases, graving-docks, stores, mills, &c.

We will begin with a \$3,000,000 project.

The interest on this sum at 6 per cent. is \$180,000; and if to this we add for the annual expenses of repairs, laborers, watchmen, lock tenders, &c., say \$50,000, we have in round numbers \$240,000, as the approximate revenue that must be derived from shipping the bulk of 2,666,666 barrels, [omitting, for a moment, the consideration of westward bound freight] in order that the investment shall pay 6 per cent.

To do this, every barrel must pay nine cents; or, allowing the westward bound freight to equal 20 per cent of the exports, 7½ cents.

But the *present* average charges on flour and grain received at Montreal, and there shipped, do not exceed 6 cents per barrel of

bulk;—and if to *every* barrel of bulk we add 1 cent to cover the loss, which flour *sometimes* sustains, by the present system of carting from the lake craft or stores, to the sea-going vessel;—and for the diminished price at which it *sometimes* sells in foreign ports, in consequence of the barrels having become soiled by exposure and rolling on the wharves, [both of which items will be saved by the docks] we still have but 7 cents charge and loss by the present system, against $7\frac{1}{2}$ charge by the docks. But the advocates of docks assert that they will *reduce* the present charges to one not exceeding three cents. I do not see how, even admitting that they ship 2,666,666 barrels eastwardly;—and the cost will evidently be greater if the amount shipped fall short of this, as it infallibly would.

I am informed that the flour of which the barrels are injured and soiled, and small portions of their contents lost by carting, sells at 25 cents a barrel less in Liverpool, than that which arrives in perfect condition. But from all that I can learn, not one barrel in twenty-five is so injured. If it were, an allowance of one cent per barrel of flour only, would have been sufficient;—whereas I have allowed it on every barrel of bulk of flour and grain.

But some years would necessarily elapse before Montreal could expect to secure so perfect a monopoly under any probable circumstances;—and during the earlier part of that interval the harbor charges would have to be as high as 30 cents per barrel; gradually diminishing with the progress of the monopoly until they should finally be reduced to a *minimum a trifle greater than the other charges*.

If I am correct in these views, it will require no further reasoning to show that neither the City nor a Company should embark in an expensive system of docks.

Let us now try what would be the effect if the *Province* were to build docks at a cost of \$3,000,000, for the export of 2,666,666, barrels of grain and flour.

Here the \$240,000 required to pay 7 per cent on the investment might be met by say 5 cents per barrel for dock charges (to make them lower than the present ones) amounting to \$133,333; and by a toll of 4 mills per ton per mile through the 60 miles of

the Canada Canals, or of 27.6 cents per ton for the entire distance. Now 2,666,666 barrels amount to about 266,666 tons; so that the tolls would amount to \$73,600 :—and the combined tolls and charges to \$206,933. Again, if the revenue from westward bound freight be assumed at 20 per cent of that as exports, the last sum would be increased to \$248,380; from which deduct the \$50,000 for annual expenses, and there remains \$188,320 out of clear profit; or 6.28 per cent on the \$3,000,000 cost of the docks.

Therefore if the Province has \$3,000,000, of spare funds to invest in docks, and can assure herself that it is possible thereby to secure not only the bringing of 2,666,666 barrels of bulk of grain and flour to Montreal annually by way of the Canada Canals,—but also the sending of it away under such circumstances as shall reduce the *through* freights to the New York standard, then she might possibly feel herself warranted in embarking in the project.

Let us now proceed to the opposite extreme, and try what would be the result arising from cheaper system of docks, costing say \$1,650,000; and shipping eastward annually, a bulk of one million of barrels of flour and grain. This amount I think, there is every reason to believe will actually be shipped from Montreal within a few years. I am informed that at present she sends about two-thirds of that quantity down the St. Lawrence.

In this instance, the interest at 6 per cent on \$1,650,000 is \$99,000;—the annual expenses say \$50,000;—making the annual revenue required in order to pay 6 per cent, \$149,000. To meet this we have the shipping eastward of 10,000 barrels at five cents (to reduce it below present charges and losses) or \$50,000;—add 20 per cent for revenue from Westward-bound freight, and we have a total revenue of \$60,000. So that even in this case, the City or the Company building the docks would sustain an annual loss of \$89,000.

Lastly,—suppose *the Province* should build these cheaper docks, would they in *that* case prove remunerative? The Province in addition to the foregoing \$60,000 of dock charges would receive tolls on her 69 miles of the Welland and St. Lawrence Canals for the additional 332,333 barrels over what now go to Montreal, at

the rate of say four mills per ton per mile,—or 27.6 cents per ton, for 33,333 tons throughout. This gives us \$9,200 ;—which added to the \$60,000 from dock charges makes a total revenue of \$69,200 ; leaving an annual deficiency or loss of \$79,800.

It has been suggested that inasmuch as the Province, will soon be compelled, [without any reference to docks] to extend its canal basin space at Montreal, government might be induced to build the cheap system of docks, which would afford the required canal room, as well as satisfy the wants of the shipping interests. But the cost of the intended Provincial improvements will probably not exceed \$100,000 the interest on which being but \$6000 would still involve an annual loss of \$73,800, supposing the additional export of 333,333 barrels to take place.

From the preceding remarks it appears to me that an attempt to reduce the present charges on produce by the construction of docks on any scale whatever, must be entirely futile ; and if persisted in, *at this time*, will but add one more to the many grand but unremunerative works which have already absorbed such immense sums of money in Canada.

Under this conviction, I feel it incumbent on me to caution the citizens of Montreal against embarking in any system of docks, *at least at present*. Should future developments of commerce bring about a posture of affairs different from that which now exists,—and one which shall change the unpropitious aspect which the project now wears, it will then be time enough to take the matter up in earnest.

During the interval, the present harbor may be made to fulfil every necessary purpose, its improvements may be gradually carried on so as to keep pace, step by step with the increase of commerce ;—and at a very moderate expense when compared even with the cheapest system of docks. My estimate for the entire improvements which I have proposed between Victoria pier and the Lachine Canal, is but \$326,343 ;—and for this sum, berths may be obtained for *at least* 36 sailing ships of 1000 to 1200 tons burden, lying with their broadsides against piers and wharves, having 20 feet water at the very lowest stages ;—besides nearly half a mile of wharfages with 18 feet water in Elgin, Metcalf and Sydenham

basin. In all cases there is room for two ships to lie abreast, so that double the number may be accommodated, and the harbor will not become crowded until it is required to berth more than 86 ships at once.

It is barely possible that I have taken an erroneous view of the whole subject;—but as no positive calculations in dollars and cents have been submitted to me respecting it, I have been compelled to institute one for myself.

But on the other side it must be remembered that we sometimes deceive ourselves by generalizing on too grand a scale, without due consideration to the counteracting influence which may be exerted by many elements which singly we neglect as unimportant but which in the aggregate become truly formidable.

So long as our imaginations merely indulge in vague dreams of an unlimited increase of commerce, we may safely insist that the securing of it will justify an almost unlimited expense;—but when we are called upon to invest our money for that purpose, it is safer to reduce our ideas to a more definite shape;—to compare carefully the several items on both sides of the account;—and prepare ourselves to answer with more certainty that important question “WILL IT PAY”?

Canada herself is not wanting in illustrations of this position. Which of all the grand schemes that have been realized within her borders, was undertaken without a full conviction that it would pay? None. Which of them *has* paid? None. Let us then take warning by these examples;—our case is far more encumbered by doubt-suggesting considerations than were any of those just alluded to.

We will now pass on to the question *how large should docks be* for shipping, a given amount of produce,—say, for example one million of barrels of bulk.

The shipping season at Montreal continues for about 7 months, or say 200 days. This would require at the rate of 5000 barrels to be shipped daily during the season of navigation; or that the equivalent of a 1000 ton ship [10,000 barrels] should leave every two days. If we suppose, that by means of elevators and cranes such a vessel could be loaded in 6 days; or [to allow for discharge

of partial cargo also] say 8 days, then the docks would need to be of only sufficient capacity to contain four such vessels at a time, *supposing one vessel to enter as another leaves, every 2 days*] beside the lake craft which must be alongside of them to discharge.

But such extreme regularity of entering and leaving the docks cannot be depended upon,—nor even an approximation to it, especially in the case of sailing vessels, no matter how perfectly the business may be systematized in theory. Moreover the arrival of the grain and flour is not equally distributed over the entire shipping season; but a large amount is generally crowded into market at the opening of navigation; requiring an increased number of vessels to be ready for its reception at that time, to avoid the necessity for storing it. Should the docks be large enough to contain 20 vessels of 1,000 tons, they would in all probability be amply sufficient for the export of one million of barrels; but those which I shall suggest will be capable of accommodating 38 one thousand ton sailing vessels, together with the lake craft, and a sufficient space for two large ships to pass each other. Beside this, they will admit of extension at a comparatively moderate expense to 3 miles of wharfage, with a capacity of 100 ships of 1000 tons with their complement of lake craft, &c. Indeed should it ever become necessary, they may be extended to 6 miles of wharfage, at less cost than any other plan.

The Point St. Charles project will (when fully carried out) berth 114 sailing ships of 1000 tons burden;—and the Viger Square project, the same;—in all cases supposing the ships to be in single row, broadside on the piers.

It now remains only to examine the various plans which have been submitted for the docks. They are four in number, namely 1st. The Point St. Charles project;—2nd. The Viger Square, or Hochelaga project;—3rd. The Central;—and 4th, that presented by myself.

The first, third and fourth are shown on the plan prepared to accompany this Report; and which is herewith submitted. For the second, I refer you to the plan prepared by Charles Maitland Tate, Esq., Civil Engineer of Montreal, and which also is herewith submitted.

THE POINT ST. CHARLES PROJECT.

This truly magnificent project contemplates the enclosing of a portion of the River St. Lawrence in front of the upper portion of the City, and extending down stream from the embanked approach of the Victoria bridge for a distance of about 3800 feet (or nearly $\frac{3}{4}$ ths of a mile) to opposite Windmill Point:—and with a width of 1250 feet; measuring in both cases to the outer edges of the enclosing embankment. The area thus covered is 109 acres.

The enclosing embankment will have a width of 150 feet on top; by an average of 200 feet at the base. Its top (on which it is proposed to erect warehouses, mills, &c.,) will be 25 feet above low water of the river. On the river side the embankment will have a slope of $1\frac{1}{2}$ to 1;—and will be protected by a facing, 10 feet thick, of rough stones carefully deposited. On the inside it will be upheld and protected by cribwork averaging 19 feet high, by about 22 wide, and filled with broken stone. This cribwork will support a wall of masonry, 8 feet high, by 5 feet average thickness,—and strengthened by buttresses. [See Section No. 2, on the plan.] Behind these cribs and wall, will be a thickness of 20 feet of puddle;—which in my opinion should be carried down to a depth of at least 6 feet below the river bottom, to prevent leaks.

From the lower end of these enclosed 109 acres, the lock projects into the stream about 500 feet more; having a chamber of 400 feet by 50 feet in the clear;—with a single lift of 20 feet above low water of 17 feet on the mitre-still of the outlet gate of the Lachine Canal.

The river bottom will form also the bottom of the dock basin. It varies but little from level—and will require some blasting of rock only in the southwest corner, to secure the minimum depth of 20 feet in the basin.

The space between the inner mound of the enclosing embankment and the shore will partly be occupied by the graving docks, S' S", and by the secondary basin T', which gives access to them from the main basin; as well as to the lock K" of 5 feet lift, by which the docks communicate with the Lachine Canal. The remainder of the space, or O' O", will be filled up with earth, for

the formation of streets to unite the docks with the city. It is contemplated to confine the tail-race of the present mills between two rough stone walls rising to the level of said streets.

A reference to the plan of the docks, and to the section of the enclosing embankment, will supercede the necessity for further description.

As represented on the drawing, the Point St. Charles dock would accommodate eighty-six 1000 ton sailing vessels lying broadside against the wharves and piers; but by increasing the number of piers it could be made to contain 114, besides lake craft. An ocean steamship of 19 feet to 20 feet draft will occupy about twice the wharfrage of a 1000 ton sailing vessel.

This project is better adapted than any of the others to an economical application of its surplus water to milling purposes, inasmuch as the tail-water would discharge *directly* into the river, thus avoiding the expense of a long tail-race.

The following is my estimate of its cost, provided only with the eleven piers shown in my drawing :—

Lock, complete, as per estimate given in detail for my own project, which see. (This lift being only 20 feet, while mine is 25, the walls will not be so high, but should be made thicker, in consequence of its great exposure to floating ice)	\$583,441
Outer guard-wall of lock, 200 feet long, by 27 high by 15 thick, = 3000 cubic yards, at \$13	33,000
Cofferdam for lock, pumping, removing boulders, &c., say...	75,000
4 draw-bridges at \$25,000 (the same as in the other estimate)	100,000
Enclosing embankment on three sides and at the lock, say 9000 feet long, by 140 wide by 27 high, = 1,260,000 cubic yards, at 40 cents	504,000
Additional embankment against mound of Victoria Bridge, and at the rounded south-east angle of the basin,—say 1200 feet by 140 by 27, = 168,000 cubic yards, at 40 cents	67,200
Protection of broken stone for outer slope of embankment and lock, 4,500 feet by 44 by 10, = 73,333 cubic yards, at \$2.50, including blasting it from the dock bottom (mostly under water), and afterwards depositing it carefully on the outer slope	183,333
Main crib entirely around basin filled with broken stone, 8,200 feet by 19 (average height) by 21½ average width, = 109,637 cubic yards, at \$1.40 (the same as in my project)	153,492

Pier cribs (11 in number), 7,935 feet by 15 feet by 19 feet, 83,758 cubic yards, at \$1.40.....	117,261
Puddling, all round the basin, behind the cribs, 8,300 feet by 20 by 27, = 166,000 cubic yards, at 20 cents a yard, inde- pendently of the stuff, which was included in the embank- ment.....	33,200
Stone wall around basin on top of main cribs, 8,200 feet by 8 by 6, including buttresses, 14,578 cubic yards, at \$10.....	145,780
Stone walls around sides and ends of piers, on top of pier cribs, 8,100 feet by 8 by 3½, = 8,400 cubic yards, at \$10.....	84,000
Filling up with broken stone behind wall on top of main cribs, 8,200 feet by 13 by 8, = 31,585 cubic yards, at 50 cents...	15,792
Filling up with broken stone on top of 11 pier cribs, 3,467 feet by 8 by 94, = 96,563 cubic yards, at 50 cents.....	48,281
Lock K", uniting docks with Lachine Canal—masonry 1000 feet by 15 by 7, = 3,889 cubic yards, at \$13.....	50,557
Gates for lock, breast-wall, floors, machinery, &c., say.....	30,000
Two graving docks, as in other estimates.....	260,000
Culvert behind mills for tail-water, say two walls, together 4,000 feet by 25 by 8, = 29,630 cubic yards rough walling, at \$5	148,150
4-inch flooring over cribs, and for a width of 50 feet around the basin 255,000 cubic feet, at 20 cts laid.....	51,000
Sills for do, 60,000 cubic feet, at 15 cents laid.....	9,000
Filling with earth at O', 1,300 feet by 325 by 24 average height, 375,555 cubic yards, at 40 cents.....	150,222
Filling with earth at O", 1200 feet by 160 by 21 average height, 14,333 cubic yards, at 40 cents.....	59 733
Cribwork at W W' W" W"', 1500 feet by 19 by 15, filled with stone, 15,833 cubic yards, at \$1.40.....	22,166
Stone walls on top of ditto, 1,500 feet by 8 by 3½, = 1,555 cubic yards, at \$10.....	15,550
Work at both ends of lock K", to allow vessels to enter, say..	15,000
Puddle-trench excavation under outer side and two ends of enclosing embankment, 5,380 feet by 27 by 6 deep (chiefly rock), 31,680 cubic yards, at \$3.....	95,040
Puddling ditto, 31,680 cubic yards, at \$1.....	31,680
	<hr/>
	\$3,087,878
Add for contingencies of very hazardous construction, 25 per cent.....	771,969
	<hr/>
Total	\$3,859,847

By omitting for the present all the piers and the graving-docks, as well as most of the earth filling O' O", and of the covered tail-race, the *primary* expenditure might be reduced to \$3,000,000.

But if the introduction of the tailrace of the water works, or of a new feeder into the docks, be insisted on, then an addition must be made for that item. Neither of these is necessary, for by widening the few narrow spots on the Lachine Canal, a sufficiency of water may be admitted into it to supply docks also.

From what I have before said, it follows that I must consider the cost of this noble project (even with the suggested reductions) as an insuperable objection to it. It is unnecessary to recapitulate reasons already given. The objection would not apply with so full force as it does, were the plan susceptible of being carried into execution *by degrees*. But it is evident that at least the entire enclosure,—the locks— and some other essential accessories must be completed before it can be applied to its intended purpose, even on the most limited scale; and these constitute the great bulk of its cost of \$3,000,000.

Another objection of no light weight, is its difficulty of access from the city. The main approach to it must necessarily be near its northwest corner, across the present drawbridge over the Lachine Canal,—aided perhaps by one or more new ones close to it. The crowded condition of the Canal renders this resort to bridges over it a serious drawback to the project.

Again, in the opinion of many citizens of Montreal, the structure would be in danger from the shoving and piling up of the ice, which it is well known acts in front of that city with a peculiarly destructive energy. Commissioners Street (running along the front of city) is 21 feet above low water, and although sometimes overflowed a few inches in winter, is generally regarded as high water mark. Yet the ice has been piled to a height of 25 feet upon it; reaching to 46 feet above low water, and nearly to the cornices of the warehouses with which the street is lined,—and actually crushing in parts of the heavy revetment wall of solid masonry, which acts as a retaining wall to the eastern side of the street.

Now the top of the embankment which is to enclose the Point St. Charles Docks is but 25 feet above low water,—or but 4 feet

17,261

33,200

145,780

84,000

15,792

48,281

50,557

30,000

260,000

148,150

51,000

9,000

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59 733

22,166

15,550

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above Commissioners Street,—or 21 feet *below* the height to which the ice piles up on said street.

The construction of the Victoria Bridge will diminish the virtual width of the St. Lawrence at that point, about $\frac{1}{2}$ part; and I am apprehensive that the increased velocity of the river, produced not only by this contraction, but by that caused by the docks themselves, will at times serve to augment the height of the inundations caused by the packing of the ice at St. Helen's Island;—and that this fact, aided by the facility which the outer sloped face of the dock enclosure affords to the ascent of the ice, may expose the structure to imminent danger, not only during its construction, but even after its completion. I do not hesitate to assert that I consider the construction of the work to be attended with great hazard, unless proceeded with in a much more secure and expensive method than is at present intended;—and even if it should be completed, it is not difficult to conceive that the falling in of the overtopping ice should at times cause great damage to vessels wintering in the docks.

Whether these apprehensions be well founded or not, they are at least entertained by residents of Montreal, as well as by myself; and a projected harbor should be “above suspicion.”

It may be remarked of *any one* of all the proposed plans of docks for Montreal, that if it should cause the improvement of the present harbor not to be proceeded with,—and should all vessels of heavy draft be compelled thereby to go into the docks, there to discharge at a no less cost than they could do in the harbor, and thus incur the expense of increased cartage, I conceive that a direct injury would be inflicted upon the local commerce. A very few persons owning unimproved property near the docks would be benefitted; but the very many who have already invested their money in the erection of costly warehouses along the present harbor would sustain severe losses.

If the Point St. Charles project were constructed in such a manner as to preclude all possible danger from ice—and completed with all its piers,—having the space between the docks and the shore filled up, and properly improved with streets, it would form one of the finest works of the kind in existence; but I am confident

that this could not be effected for a less sum than about \$5,000,000.

THE VIGER SQUARE, OR HOCHELAGA PROJECT.

See accompanying plan prepared by Mr. Tate.

This project proposes to carry a continuous line of $3\frac{1}{4}$ miles of narrow docks and canal directly through the length of the city,—and nearly parallel to the river front; the distance between said line and the river ranging generally from 1-5th to $\frac{1}{4}$ mile.

Commencing with two locks, each of about 13 feet lift, which unite them with the River St. Lawrence at Hochelaga Bay, $2\frac{1}{4}$ miles below the outlet lock of the Lachine Canal, the reposed docks are carried with a width of 200 feet, and a depth of 20 feet, for a distance of $1\frac{1}{2}$ miles to Viger Square. Here they expand into a basin 400 feet long, and 550 feet wide. At the upper end of this basin, the docks proper terminate; and the extension upward from that point consists of a Canal $1\frac{1}{2}$ miles long (with 100 feet of surface width; and 10 feet depth of water) which finally opens into the Lachine Canal, and on a level with it, at Seminary Basin.

This Canal prolongation of the docks proper is intended to serve the double purpose of a feeder for the docks, from the Lachine Canal; and of an avenue through which the lake craft can pass from said Canal to the sea-going vessels lying in the docks proper, at and below Viger Square. In order to furnish sufficient room for large lake craft to pass each other with facility, the sides of the Canal are proposed to be nearly vertical,—and to be protected by planking sustained by double rows of piles connected by land-ties.

A similar course is also proposed for the docks proper. At Haymarket Square the Canal expands into a small basin about 300 feet square: and an enlargement of the Seminary Basin is proposed where the Dock Canal enters the Lachine Canal.

I consider 200 feet rather too narrow a width for a long line of dock, as it would not permit two steamships to pass each other between two similar vessels lying on opposite sides of the dock, and having large lake craft alongside transferring cargo: and such a contingency would frequently occur in docks doing a heavy business.

The number of drawbridges, with their annual expense of attendance is an unfavorable feature in this scheme ; as is also the fact that the lower portion of it is too distant from the centre of business.

The communication with the Grand Trunk Railway would require a much longer branch than any of the other projects.

This project, however, is characterized by one highly important feature which is possessed by none of the others : and that is, that it avoids the rapid current St. Mary,—and with it the cost of towing, and the vexatious delays to small sailing craft, by which it is attended. A most unfortunate error was committed in the original selection of the site of Montreal, by placing it just *above*, instead of *below* this rapid ; and this error has been confirmed by the subsequent one of not placing the outlet of the Lachine Canal (as could readily have been done at the time) below the same rapid.

The only feasible remedy that now remains for the partial rectification of these oversights, is the construction of the Viger Square scheme of docks and canal. But I fear that the expense attending its execution,—and the absence (in my opinion) of all pecuniary inducement for undertaking it will constitute insurmountable impediments to its realisation. The great value which (since the completion of the Lachine Canal) has been attained by the property through which the project would pass ; together with the large amount of space required, appears to me to preclude all hope of a successful issue.

The estimate of Messrs Tate and Trudeau, Civil Engineers for the cost of the docks and canal alone,—without any allowance for graving-docks, *ground*, and destruction of buildings, is \$1,750,000.

But the *water-area* alone of the docks and canals is about 65 acres,—without making any allowance for tow-paths, streets, and railway tracks along the docks ; space for warehouses, and all the other collaterals of the scheme.

I am informed, however, that of these 65 acres, it is probable that 17 would be contributed gratuitously ; thus leaving but 48 to be purchased. These last could probably not be obtained at a less average rate than \$15,000 an acre ; or a total of \$720,000 ; thus

swelling the cost of docks, canal, and the space actually occupied by *their water surface* to \$2,470,000. To this must be added the cost of buildings destroyed, as well as of those injured,—the purchase of whole lots which would be rendered valueless to their present owners, when a large part should be taken away from them; interference with the present gas, water-pipe, and drainage system of the city, &c., &c. Although I do not suppose that \$250,000 would cover these items, still, as perfect accuracy is neither essential, nor attainable at this moment, we will assume, that sum to be sufficient. This gives us \$2,720,000, as the very smallest expenditure that would serve to construct the docks and canal, without tow-path, wharf-room, or any of the collateral requirements of the scheme; and supposing the first item of the estimate to be correct.

It will be seen that Messrs. Tate and Trudeau have marked on their plan, a space of 200 feet wide along each side of the *docks* as requisite for warehouses, streets, wharf-room, &c.: and I concur with them that a less width should not be secured for those purposes. This would require 86 acres more. But we should add *at least* 50 feet on each side of the *canal* for tow-paths,—narrow wharf space,—and for the branch railway from the Grand Trunk. These require still 20 acres in addition, making in all 106 acres more; and if we assume an average of but \$16,000 per acre as sufficient to cover both ground and buildings, we have \$1,696,000 as their total cost. This swells the estimate to \$4,416,000.

Finally we should take into consideration that the wharfing proposed for these docks, and for their canal-feeder, is very temporary in its character when compared with that proposed by M^r. Forsyth for the Point St. Charles, or by myself for the central, and for my own project. To bring the estimates of the three projects, therefore, to terms of equality, for enabling us to judge fairly of their comparative merits, I find that we must add *at least* \$700,000 for this item alone,—making the estimate \$5,116,000.

I have not seen the details of the estimate for this project; but I observe that the total for the two locks at Hochelaga Bay is set down at \$272,000; whereas mine for two of the same dimensions for the central project, is \$678,000; or two and a-half times as great.

I have omitted the cost of the excavation, grading, &c., necessary for preparing the ground for the purposes of streets, railway tracks, warehouses, &c.; and indeed I might refer to other incidental sources of expense, such as graving docks, &c., were it not that the sum already reached,—or one half of it,—is sufficient basis for my objecting to this otherwise admirable scheme.

So thoroughly convinced am I of the entire inadvisability of investing money in *any* of the proposed dock projects,—and so incontrovertible do the calculations of revenue into which I have already entered appear to me, that I should consider it a mere waste of time to prolong the discussion of this point.

The intrinsic merits of the Viger Square scheme had strongly prepossessed me in its favor; but a close investigation of all the points involved, compel me unwillingly to class it along with the others, as being nothing more than a capacious abyss, into which much money may be recklessly thrown away.

Previous to making any calculations on the subject, I had supposed with many others, that in case the Provincial Government should not see proper to undertake its execution, it might at any rate be ensured by the organization of a Company, who should purchase all the required property, depending on its rapid increase in value, after the completion of the docks, for reimbursing themselves; it being at that time taken for granted that the docks and canal would at least return an interest on their own immediate cost. But as our calculations show that the latter supposition is untenable, the former, which was based upon it, must necessarily be abandoned also. The paramount object of docks is to diminish the present port charges;—but inasmuch as we have seen that even the cheapest system of docks must increase them, the entire subject assumes a different phase.

The Viger Square scheme would involve the necessity of a series of draw-bridges through the entire length of the city. A very limited amount of water-power might be rendered available near its outlet into the St. Lawrence.

I attach no great force to the suggestion that the general drainage of the city would be benefited by the project, inasmuch as the Canal surface would in certain parts be higher than the

city levels; and there are various other considerations connected with the peculiar topography of Montreal, which involve the question of its drainage in some difficulty. My attention, however, was not directed to that subject, nor did I devote any time to its investigation.

Deeming it unnecessary to discuss the many minor arguments in favor of, or in opposition to, the Viger Square project, I will now pass on to

THE CENTRAL PROJECT.

This scheme, like the Point St. Charles, does not involve the necessity for purchasing the ground which it occupies, inasmuch as its location will be on a piece of property belonging to the Provincial Government, and purchased for the express purpose of being appropriated to canal basins. The intention of the Government will of course be fulfilled to a greater extent than was anticipated at the time of the purchase; for lake craft could not only lie in the docks, as was intended, but could unload directly into the sea-going vessel.

The locality, as well as the disposition which I should suggest to make of it, is shown on my plan. It comprises between 28 and 29 acres, with a front of about 1500 feet on the North side of the Lachine Canal.

It will not require the destruction of any buildings, or interfere with any important thoroughfare.

The average depth of excavation required for 20 feet of water is 15 feet (as the general surface of the property is 5 feet below that of the canal), with an embankment around the sides of 10 feet in height. The material is earth, very favorable for the purpose.

It will be seen that I propose to wharf the sides of the basins and of the deepened canal, as well as the piers, in a permanent and substantial manner, as shown at Section No. 1 on the plan. This section is the same that I propose for my own scheme of docks.

The four piers have an average length of 655 feet each, and a uniform width of 100 feet. They and the face-wharves afford 1½ miles of wharfing, and will accommodate 46 ships of 1000 tons burden lying singly, broadside on,—beside the lake craft.

The space of 300 feet is left between the outer ends of the piers, and the South side of the Lachine Canal, to facilitate the turning of steamships and other large vessels.

All the wharves and piers are perfectly accessible from the city, without the intervention of draw-bridges. A draw-bridge, however, would be required over lock B".

The docks thus described will communicate with the River St. Lawrence through that portion of the Lachine Canal which is lettered A" B" G" H" J" and colored green:—and which would be deepened to 20 feet for the purpose. The two locks A" and B", each of $12\frac{1}{2}$ feet lift,—and of 400 feet by 50 feet clear in the chamber, would also be necessary.

The most serious objection to this scheme, is the inconvenience which would result from the interruption of the Lachine Canal for perhaps 2 years, by the proposed deepening, and by the construction of the locks, and of new face-wharves in basins No. 1 and No. 2.

Perhaps of no less weight is the objection that the Canal basins are already crowded; and the necessity for passing large sea-going vessels through them after the completion of the docks, would greatly increase the inconvenience now experienced.

Being upon firm ground, the construction would be unattended by any hazard. Should graving-docks be required, they may be placed at R' R', which is the site I propose for my own. These central docks are disadvantageously situated for the application of their surplus water to milling purposes, in consequence of the great length of expensive tailrace which they would involve.

This, however, might be obviated by introducing water for mills from above the St. Gabriel Lock, and letting it discharge into the docks after having performed its work.

It appears to me that the best mode of effecting a communication with the Grand Trunk Railway, would be by berthing the communicating vessels along the South side of the Canal, opposite to the docks.

The following is my

Estimate of the cost of the Central Project :

Excavation of 2 lock-pits, 78,000 cubic yards, at 40 cents.....	\$ 31,200
2 locks, 43,000 cubic yards, masonry, at \$13.....	559,000

Floors of chambers, and aprons between wings.....	28,000
6 pairs of gates, and fixtures complete, at \$8,000.....	48,000
Crabs, chains, collars, anchors, rollers, segments, &c., 6 sets at \$2,000.....	12,000

Total for 2 locks.....	\$ 678,200
Deepening 100 feet in width of Basin No. 1 to 20 feet (now 16 feet) 6666 cubic yards, at 50 cents.....	3,333
Deepening 125 feet in width of Basin No. 2 (from F" to G") to 20 feet (now 9 feet), 46,000 cubic yards, at 50 cents.....	23,000
Deepening Lachine Canal for 125 feet in width from G" to \$ (3540 feet) to 20 feet, (now 9 feet,) 180,000 cubic yards, at 50 cents.....	90,000
Excavating Basin, and forming part of the stuff into embank- ment around the basin, 1500 feet by 820 by 5, = 683,333 cubic yards, at 25 cents.....	170,833
Rough cribwork, 4 feet high, 5 feet wide, and 400 feet long, in Basin No. 1 (to uphold side of excavated channel), filled with stone, say 300 cubic yards at \$1.40.....	420
Rough cribwork in Basin No. 2, along the line F" G" H" for the same purpose, 2000 feet long by 11 high by 8 wide, 6518 cubic yards at \$1.40.....	9,125
Wharfing the North side of Basins No. 1 and 2, and of the Canal as far as the docks, as per Section No. 1 on my plan, say 3000 lineal feet at \$31 70.,.....	95,100
Similar wharfing around 3 sides of the dock-basin, and around each of the 4 piers in the basin, 8620 lineal feet at \$31 70..	273,254
Similar wharfing on the South side of the Canal from H" to S, 2400 lineal feet at \$31 70-100th.....	76,080
Drawbridge across lock B".....	25,000
Filling in of the 4 piers in the docks, with earth excavated from the basin, 166,000 cubic yards at 12½ cents.....	20,750
	\$1,465,095
Add contingencies 15 per cent.....	219,763

Total.....\$1,684,858

Exclusive of graving-docks.

By omitting all the piers, as suggested for the Point St. Charles project, the *primary* outlay would be reduced about \$180,000. making the cost only \$1,504,858.

The docks would then accommodate 20 one thousand ton sailing ships lying singly alongside the wharves,—with abundant space for lake craft.

Having regard to all the actualities of the case, I consider the Central project as an infinitely more advisable one than either of the preceding.

Finally, we will examine the scheme for docks proposed by myself.

The site for this is a strip of ground M' M' M'' M''' about 445 feet wide,—lying between, and nearly parrallel to Wellington Street, on the west,—and Canal Basins Nos. 1 and 2, on the east; and extending southwardly 3,000 feet from Grey Nun Street, which form its northern limit.

In addition to this, it embraces the elbow W, and the space occupied by the lock C". All of these are colored *darker blue* than the remainder of the plan.

This site is perfectly accessible from the city,—and far more convenient to business than any other that presents itself.

In order to prevent any interruption to transit along Common Street, two drawbridges are proposed across the lock C" which even in the busiest times, would not be used more than 4 or 5 times in 24 hours.

An avenue from 70 to 90 feet wide, and floored with 4-inch plank, will surround the docks,—as shown by the yellow line.

The depth of excavation for giving the docks a depth of 20 feet will average 15 feet; and in order to give the surrounding avenues a height of 5 feet above the surface of the water, a portion of the excavated material will be made into embankments 10 feet high around the docks.

The dock basin itself will be 275 feet wide. Its short extension to the south of the Lachine Canal is for the accommodation of the Grand Trunk Railway.

Mills with short tail-races may be advantageously placed around the north end of the dock basin.

Graving docks, if required, may be constructed, as shown at R' R'.

This, like the central project, is free from all danger from interruptions from the river during its construction, and may be carried on in perfect security. Neither will warehouses or mills along its sides be liable even to suspicion of injury from the same source.

It avoids all that serious interruption to the Lachine Canal which characterizes the central project, and it is in the very midst of the flour and grain business.

The portion colored *dark blue*, and enclosed by the letters M' M' M' M', will furnish 5,800 lineal feet (or 1 1-10th mile) of *available* wharfage, and will with ease accommodate 38 one thousand ton sailing ships lying singly alongside of the wharves, together with their complement of lake craft—a number amply sufficient for the export of 2,500,000 barrels of bulk annually, without the necessity for storage. I have before remarked that such steamships as ply between Montreal and Europe require about as much wharfage front as two 100 ton sailers.

Estimate of Cost of Docks proposed by JOHN. C. TRAUTWINE:

Excavation of lock-pit, 66 000 cubic yards, at 40 cents.....	\$ 26,400
Masonry of side walls of lock chamber, 800 feet long by 54 high (allowing 7 feet depth of foundations) by 20 feet average thickness, = 31,000 cubic yards, at \$13, including a short cofferdam at outlet.....	416,000
Two upper wings, 200 feet by 28 feet high (allowing 6 feet depth of foundations) by 9 feet average thickness, 1,867 cubic yards, at \$13.....	24,271
Two lower wings, each 100 feet long, or 200 feet feet in all, with a mean area of 575 square feet, 4,260 cubic yards, at \$13.....	55,380
Breast-wall, 50 feet by 32 by 14, = 830 cubic yards, at \$13	10,790
Floor of lock, and apron below the lock, 78,000 cubic feet of timber, at 20 cents a foot in place.....	15,600
Two pair of gates, at \$10,000 a pair.....	20,000
One pair of upper gates.....	9,000
Crabs, chains, collars, anchors, roller segments &c. 3 sets, at \$2000	6,000
Total for lock.....	\$ 583,441
7000 lineal feet of wharfing around the dock basin, as per section No. 1 of accompanying plan, at \$31 70.....	221,900
Excavation of basin M' M' M' M', 3100 feet by 315 feet (including thickness of wharfing), by 15 average depth, 542,500 cubic yards at 25 cents.....	135,625
Excavation of basin W, 500 by 300 by 11,61,000 cubic yards at 50 cents.....	30,500

Cribbs filled with stone across the Lachine Canal at the two places at which it intersects the dock basins, (for upholding the steps made in the bottom by deepening from 9 to 20 feet), 550 feet long by 11 high by 8 thick, 1793 cubic yards at \$1.40.....		2,510
4 draw-bridges, at \$25,000 each	100,000	
		<hr/> \$1,073,976
Contingencies 10 per cent.....	107,397	
		<hr/> \$1,181,373
Add for ground and buildings, as per estimate of Messrs. W. Spier & Son, of Montreal		485,000
Total.....		<hr/> \$1,666,373

No deduction is made for the value of materials in the buildings.

Hence it appears that my project will cost but \$18,485 less than the central, and will accommodate 8 ships less than it.

An excellent feature in my project, and one which distinguishes it from all the others, is the moderate outlay at which it admits of almost indefinite extension.

Should an enlargement be required at any future day, I should recommend the removal of Tate's dock, and the construction of three parallel basin, instead of the *one* shown on my plan on the property of the Provincial Government lying on the south of the Lachine Canal. By this means far more extended facilities for mills would be obtained, beside securing an *additional* wharfage of 10,008 lineal feet (or nearly 2 miles), capable of accommodating 66 *additional* one thousand ton ships; and all at the following very moderate cost:—

1000 lineal feet of wharfage like Section 1, at \$31.70.....	\$317,000
1,130,000 cubic yards of excavation, at 25 cents.....	282,500
	<hr/> \$599,500
Contingencies 10 per cent.....	59,950
	<hr/> \$659,450

This, added to be preceding estimate for my project, makes \$2,325,823, for which we get 3 miles of wharfage, or a third of a

mile *more* than is shown by the plan of the Point St. Charles, even with its eleven piers, and *at an expense of full \$1,000,000 LESS than it would cost.*

The extension shown on the property of the Grand Trunk Railway Company would give $1\frac{1}{2}$ miles more of wharfage; and finally the docks of the central project (omitting its locks, &c.,) might be brought in with an additional $1\frac{1}{2}$ miles, giving in all 6 miles of wharfage, against the 3 $\frac{6}{10}$ ths miles of the Point St. Charles project, *when filled with piers to its utmost capacity*; and at a total expense not exceeding that of the Point St. Charles, when it shall be completed, as shown on my plan; but omitting the graving docks.

It appears to me utterly impossible to hesitate between the two.

With this I conclude. I have investigated the general question of improving the Port of Montreal to the best of my ability; and in doing so, I have laid before you my reasons and my figures, in order that any errors may be detected and rectified.

I again recommend to the citizens of Montreal to confine their attention to the improvement of their present harbor, and to lay aside all dock projects for years to come.

But if, after reading my arguments, they still insist upon a system of docks, I should advise them to adopt the one proposed by myself, as combining the elements of economy, capacity, convenience and safety to a greater extent than any of the others.

In conclusion, gentlemen, permit me, through you, to convey to the many citizens of Montreal with whom I came in contact during my visit to your city, my deep sense of the kindness and courtesy so universally manifested towards me by them; and allow me to subscribe myself, with high respect,

Your very obedient servant,

JOHN C. TRAUTWINE.

Philadelphia, Nov. 3, 1858.

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RIVAL ROUTES TO THE OCEAN

FROM THE WEST ;

AND

DOCKS AT MONTREAL.

CONSIDERED IN A LETTER TO THE HARBOUR COMMISSIONERS.

BY THE HON. JOHN YOUNG.

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TO THE HARBOUR COMMISSIONERS OF MONTREAL.

GENTLEMEN,

The Report lately laid before the Harbour Commissioners of Montreal and a Committee of Citizens on Harbour Improvements, by Mr. Trautwine, embodies opinions in reference to the Public Works of Canada and the route of the St. Lawrence from the interior, as to their power of competition with the Canals of the State of New York for the vast and rapidly increasing trade between the Atlantic and the Western States of the Union, as well as of Western Canada, so utterly at variance with all previously expressed views on the same subjects, that I deem it my duty to point out what seem to me Mr. Trautwine's erroneous conclusions. I shall at the same time examine his Report in reference to the construction of Docks at Montreal. On this subject, it is well known that I have always connected the subject of Docks at Montreal with the improvement of the St. Lawrence navigation from the Upper Lakes, and with the construction of a Canal to connect the waters of the St. Lawrence and Lake Champlain; and it is on this broad ground that I still urge the necessity of Docks, believing as I do that the whole subject must soon receive that attention from the Executive of Canada which its importance demands.

I shall confine my attention to Mr. Trautwine's Second Report on Docks, as there is nothing in his first Report on the improvement of the present Harbour which calls for particular notice. The improvement of the Island Wharf has been under consideration by the Harbour Commissioners for some time and had been

resolved on, and the mode of construction pointed out by Mr. Forsyth previous to Mr. T.'s arrival in Montreal. The plan suggested by Mr. Trautwine for the accommodation of the Ocean Steamers will not, in my opinion, upon examination, be found so desirable as that suggested by Mr. Forsyth; nor do I think it will be prudent to build any of the wharves on the slanting principle suggested by Mr. Tate, and approved by Mr. Trautwine.

To the people of Canada, there can be no object of so much importance as that of securing the great and growing carrying-trade of the interior, which was the chief reason for the construction of those expensive works which connect Lakes Erie and Ontario, and which line the St. Lawrence from Kingston to Montreal. It was not for the carrying-trade of Canada alone that these works were constructed. If they fail to secure their object—which, up to this time, is the fact—the result will be disastrous to the Province in a double point of view; for it will not only lose a great and flourishing trade, which in my opinion it is in the power of Canada to secure, but it will be burdened with costly and unproductive works, which, instead of being a source of revenue, are even now, as will be shewn, an annual drain upon the coffers of the Province.

Mr. Trautwine says :—

“The high rates of insurance incident to the navigation of the River and Gulf of St. Lawrence, and the expenses of pilotage and towage on the river, combine, with other causes, to raise the charge on the freight of a barrel of flour, to Liverpool, to 25 or 35 cents more from Montreal than from New York;—and so long as the bulk of exports shall exceed that of imports into Canada by 300 or 400 per cent., there is no assignable reason, that I can suggest, why this disparity should cease.

“Should the foregoing arguments prove insufficient to demonstrate the inexpediency of embarking in an extensive scheme of docks, it may be added that the State of New York, sooner than submit to the diversion of this branch of her exports, and permit it to seek Canadian channels, would, doubtless, choose the least of two evils, and reduce her canal-tolls to such an extent as to paralyse all efforts to that effect.

According to this view, the efforts of Canada to make the St. Lawrence the great highway from the West have been blunders; even if she were successful in securing a diversion of Western

trade into Canadian channels, the State of New York would paralyse all our efforts to maintain this trade by reducing her canal-tolls. For these and other reasons, which I shall refer to hereafter, Mr. Trautwine advises the citizens of Montreal "to confine their attention to the improvement of their present harbour, and to lay aside all dock projects for years to come;" and that any attempt to reduce the present charges on produce by the construction of docks on any scale whatever, must be entirely futile; and if persisted in, *at this time*, will but add one more to the many grand but unremunerative works which have already absorbed such immense sums of money in Canada. Under this conviction, I feel it incumbent on me to caution the citizens of Montreal against embarking in any system of docks, *at least at present*. Should future developments of commerce bring about a posture of affairs different from that which now exists, and one which shall change the unpropitious aspect which the project now wears, it will then be time enough to take the matter up in earnest."

The opinions thus expressed by Mr. Trautwine go to shew that the route from the West through the State of New York to the ocean, must continue to have a decided superiority over the route through Lower Canada;—that the merchants and the great majority of the citizens of Montreal are not fit judges of what is requisite to obtain a share of that trade;—that it is useless to make further efforts at present for such an object, but should "future developments of commerce" "providentially" bring about a different posture of affairs, it will then be time enough to move in the matter. In such a policy I, as a Canadian, and especially as a Lower Canadian merchant, cannot coincide; and although it is a labour I would at present rather avoid, still, the matter is of so much public importance, I deem it my duty to give my reasons for differing with the views thus expressed by Mr. Trautwine.

The question presented for discussion by the foregoing extracts, is not whether Docks should be constructed at Hochelaga, or at Point St. Charles, or on the lands of the Grand Trunk Company, but whether the prospects of trade by the St. Lawrence

route warrant the construction of any Docks at all. As I before said, this is a subject of the greatest possible importance to every resident of Canada, but particularly to the residents of Lower Canada, for if the great and growing trade between the Atlantic, Western Canada, and the Western States, is to continue, as it does now, to centre in New York, to diverge from the St. Lawrence in its transit, and not to come nearer Montreal than Oswego or Lake Ontario, 250 miles above this city, then it is true that Docks will neither be required at Montreal or Quebec, and the construction of our canals as well as our railways must be considered blunders, and prove an annual drain upon the Canadian people. Let me first point out, as briefly as possible, the cost of our public works on the St. Lawrence route, and the amount for which the people of this country are now annually taxed to pay the interest on these works. By the Public Accounts of 1857, it will be found that the cost of the Welland and St. Lawrence Canals, up to 31st Dec. of that year, was £3,514,322.

Deductions from revenue for repairs, collections,	
&c., &c.—Welland Canal.....	£29,027
St. Lawrence Canal.....	21,775
Expense of general repairs, as per Table No. 13	
in Public Accounts, as per special appro-	
priation	33,529
Interest on £3,514,322, at 6 per cent.,.....	210,859
	£295,190
Deduct total receipts from Welland Canal.....	59,828
" " " " St. Lawrence Canal...	17,867
	<u>77,695</u>
Loss for 1857 in operating Welland and St. Law-	
rence Canals.....	£217,495

In the next place, the advance to the Grand Trunk Railway Company by the Province, and the interest paid on the Debentures, amount to about £4,500,000, the interest on which is £270,000, so that the annual loss on our canals and the Grand Trunk Railway amounts to £487,495. If we add to this the loss arising from other unproductive canals and railways, we have an amount exceeding the sum of \$2,400,000 per annum, which the people of Canada are now compelled to pay by duties on imports.

These figures, which cannot, I believe, be contradicted, shew how great an interest the people of Canada have in the solution of the grand question whether the natural route for the great trade of the Western States and of Western Canada is to be through the St. Lawrence river to the Eastern States and the ocean, or whether that trade must continue to flow, as at present, through the more artificial canals of the State of New York, 250 miles above Lower Canada.

The question thus at issue between Canada and the State of New York is, therefore, as to which of these two great water lines can best supply the link wanted to connect the North-west with the ocean. This subject has been so ably argued by Messrs. Childe, Kirkwood and McAlpine, in their Report dated March, 1858, and addressed to the Harbour Commissioners of Montreal, that it is unnecessary for me to allude to the course of that trade, or to their statements in proof of its magnitude.

The works erected on these two routes to facilitate the transport of freight may be briefly described as follows :

At the outlet of Lake Superior, the first obstruction to navigation is overcome, on the United States side, by a Canal one mile in length, with two locks, which will pass vessels of 1200 tons. This work was constructed by the United States Company. The Welland Canal, on the Canadian side, connects Lakes Erie and Ontario, and is 28 miles long. The St. Lawrence Canals are made to overcome the various rapids of that river. And the Channel of the St. Lawrence between Quebec and Montreal has been deepened so that sea-going vessels drawing 18 feet at the lowest stage of water come up the river as far as Montreal, and operations are now being carried on to secure a channel of 20 feet.

The State of New York has built a Canal from Buffalo on Lake Erie, and from Oswego on Lake Ontario, to Albany on the Hudson River, a combined length of 569 miles, which now admit boats of about 100 tons, but will soon be completed for the passage of boats of 250 tons. The New York Canals were opened in 1825. The enlarged St. Lawrence Canals were opened in 1848. Both routes have been in use since the com-

pletion of the works : but it is matter which admits of no doubt, that the St. Lawrence route has hitherto completely failed to attract any considerable portion of the Western States trade; and that since the passing of the United States Bonding Act, in 1849, the great bulk of the exports from Western Canada, have been carried across Lake Ontario to Oswego and other Lake Ports, for shipment to Atlantic Ports, and for Sale in the Eastern States. This will be manifest from the following statement :—

The receipts of wheat and other grain, and of flour reduced to grain at the rate of $4\frac{1}{2}$ bushels to the barrel, at the Ports of Buffalo, Oswego, Dunkirk, Suspension Bridge, Rochester, Cape Vincent and Ogdensburgh,

in 1856 were	48,391,055 bushels.
1858 “ about	52,000,000 “
In Montreal the receipts in	
1856 were	4,509,243 bushels.
1857 “	4,392,453 “
1858 “	5,215,194 “

It thus appears that the receipts through our Canals at Montreal in 1856, were about ten per cent. of receipts at American Lake Ports, while in this year the receipts are also ten per cent.

Again, the Exports from Ports in Western Canada to the United States, per Trade and Navigation returns, were :—

Wheat.	Other Grain.	Flour reduced to Grain.	Total.
1856—4,362,379	735,341	1,707,990	6,005,710 bushels.
1857—2,340,372	462,580	1,690,016	4,492,968 “

These figures shew that the exports from Western Canada to the United States Lake Ports, exceed the whole of the receipts at Montreal, which include receipts both by railway and canal and all that comes from the United States and from Canada West. In a letter written to the Hon. Mr. Lemieux, Chief Commissioner of Public Works, in 1855. I pointed out the tendency of this course of trade in the following words :—

"Let it be remembered that previous to 1849, before the United States bonding bill came into operation, there was no exportation of cereals from Canada into the United States, or next to none. But what has been the amount of wheat and flour so exported since that date? Reducing wheat into flour, the amount will be found to be as follows:—

In 1849.....	24,936 barrels.
" 1852.....	466,912 "
" 1854.....	762,575 "

"These figures establish but too clearly the course which the trade has been taking; and the results of the trade of this season, when officially known, will prove that a larger proportion than ever of Western Canada cereals has found a passage into the United States. In other words, that the carrying trade of Upper Canada products, by the St. Lawrence and the Canadian canals, is rapidly decreasing, and that of the State of New York rapidly increasing. A single fact will conclusively establish this disagreeable truth. During the four weeks ending on the 31st of October, the quantity of *Canadian wheat* received at the Port of Oswego alone, was 627,000 bushels, whilst the total receipts of Canadian wheat by canal and river at Montreal, from the opening of navigation to the same date, was only 104,677 bushels."

"I then pointed out the remedy for this state of things, as I had frequently done before, but the Government was too busy about other matters to give any attention to such a paltry subject as that of the trade of the country, or to take any measures to stop the enormous annual loss which the inhabitants of this country have now to fear, from the unproductiveness of their Canals and Railways.

Now what is the reason that the trade from the Western States and from Western Canada, flows through the Erie Canal, and how is it that almost the whole imports into the Western States and a very large amount of the imports into Western Canada do not come through the St. Lawrence, but are obtained from New York through the Erie Canal and over the New York Railways? It is said with truth, that our Canals are finer, better, and larger than the Erie Canal, which is sometimes contemptuously designated as a "mere ditch." Our tolls on a barrel of Flour from Lake Erie to Montreal are only 6 cents; on the Erie Canal, the toll is 15 cents. Moreover we give back two thirds of the

toll to any vessel which comes through both the Welland and the St. Lawrence Canals,—we have built Tug-boats for the Lower St. Lawrence, to serve the double purpose of towing, and rendering aid to vessels in distress. Besides these advantages of the St. Lawrence, we can bring a vessel from any Port in the Upper Lakes, direct to Montreal, without breaking bulk, while by the Erie Canal to New York, there are two transshipments. Wheat has been carried this year from Chicago to Montreal, a distance of 1278 miles, at 11 cents per bushel, while the rate to New York has not been less than 17 cents; we have also the Grand Trunk Railway in full operation, with a full staff of employecs, ready and willing to do business, yet, at the end of 1858, the great Canals of Canada and the great Grand Trunk Railway together, have failed to do more than attract ten per cent of the trade of the Western States and of Western Canada." As stated by Mr. Blackwell in his Report to the London Directors of the Grand Trunk Company, "disappointment has followed disappointment as regards the revenue of the Company, comparing the hopes with the actual results."

Now out of the 50,000,000 bushels of Grain and Flour reduced to Grain, received in 1856 at Dunkirk, Buffalo, Suspension Bridge, Rochester, Oswego, Cape Vincent and Ogdensburgh, 40,000,000 bushels were received at Oswego and Buffalo. At both of these places there is very great capacity for flouring wheat, and there are elevators capable of storing four million of bushels. So that wheat is rapidly transferred from Lake crafts to Canal boats, at a cost of one-fourth of a cent per bushel, and is stored, for a period not exceeding one month, at a cost of half a cent per bushel.

In Montreal it costs 3 cents per bushel to cart, store for one month, and ship grain on board of ocean vessel. Again, the great bulk of the 50,000,000 bus. arriving at Lake Ports is not shipped from the United States, but is mostly consumed in the non-producing States of New England; in the same way, although the receipts of breadstuffs at Montreal in this year are equal to 5,215,394 bushels, yet the exports by sea from Montreal are only equal to 1,790,856 bushels (including wheat and other grain, as

well as flour reduced to grain). These consuming markets of New England are open, under the Reciprocity Act, alike to Western Canada as they are to the Western States.

Oswego has divided the Western Trade with Buffalo for the reason that, although an 800 ton vessel can go to the latter port from any of the Upper Lake Ports to a greater advantage up to that point, than the Oswego vessel of 350 tons (the utmost capacity of the Welland Canal), yet the advantage gained by Oswego, of continuing the voyage in the same bottom for 171 miles by the Welland Canal and Lake, against 150 miles of parallel canal navigation, nearly balances the advantage gained by Buffalo from being able to employ the large vessel up to that point. Hence the trade of the Western States and of Canada West, may be said to be divided between the Lake Ports of Oswego and Buffalo, and this not only for exports but for imports, and it seems to me impossible, under our present means of transport below Oswego, *that either the bulk of the products of Canada West, or of the Western States can pass below Oswego*, for the reason that if they did, there are no means of transport from Lower Canada to compete in cheapness with those from Oswego to Albany. The Welland Canal may be enlarged, as I hope it will be, but the advantage of that work will be almost solely for the benefit of Oswego, for with that work completed, it would be impossible to reach the New England Markets by the way of the St. Lawrence Canals so cheap as could be done by the way of Oswego, unless other works than now exist were first constructed. This position is, I think, easy of demonstration. The only means of any considerable quantities of freight reaching New York, Boston, Portland or the interior of any of the Eastern States below Prescott, or in Lower Canada, is first by the Canada and New York Railway from Caughnawaga, next by the Victoria Bridge, which connects with the Railroad to Portland, and also with Rouse's Point, where connections exist to New York and Boston. The only inter-communication for such freight with Lake Champlain is by passing down the St. Lawrence to Sorel, thence up the Richelieu River to Chambly, a distance of 90 miles, and thence to St. Johns on Lake Champlain by canal, a distance of twelve miles more.

The actual cost of moving a barrel of Flour from Oswego to Troy, 202 miles, at 10 mills per ton is, say,	20 cts.
Toll, 3 mills per 1000 lbs.,	12 "
The distance from the St. Lawrence at Caughnawaga, or from the Victoria Bridge to Albany by rail, may be said to be 260 miles, which, at 12½ cents per ton per mile, and with nine and a half barrels to the ton, the cost by rail would be per barrel,	40 "
By the Chambly Canal, even with 100 miles of extra navigation, it could be taken through Lake Champlain and through the Champlain Canal at	40 "

These are the only routes now existing for taking any considerable freight either on to Lake Champlain, or to Albany for New York from Montreal. And by the above figures it is clear, that property of all kinds, destined for a market in the Eastern States, can be shipped by the way of Albany *from Oswego cheaper* than if shipped from Montreal by any means of transport there, or at any point below Oswego. This fact is well known to all business men, and it is also well known that, to bring Western Canadian produce or Western States produce, destined for New York, Albany or Boston, down the St. Lawrence below Oswego, would be to add to the cost of transport from the St. Lawrence to New York, Albany or Boston, the cost of transport from Oswego to Montreal; in other words, if a barrel of Flour can be sent from Oswego to New York at 40 cents, it would cost at least 60 cents at present by the way of Montreal. I have not included the cost of freight from Toronto or other Canadian ports, as the cost of the ferry or bridge at Montreal will be fully equivalent thereto.

With this difference in favor of the Oswego route, it is utterly impossible that our commerce in Lower Canada can increase as rapidly as it might do. Our splendid canals on the St. Lawrence do not avail us; the Ottawa navigation might be completed, and when finished would be as deserted as are our St. Lawrence canals, without some cheaper connection with the Hudson and Eastern States than we now have. The Georgian Bay Canal might also be constructed, without Lower Canada or the St. Lawrence Canals being able to attract any more business than it now does. This view of the subject may also be supported by the following facts,

showing the amount of Wheat and other Grain and Flour reduced to Grain at the rate of $4\frac{1}{2}$ bushels per barrel exported by sea from the Port of Montreal in the last 14 years :—

	Wheat and other Grain.	Flour Meal, in bushels.	Total.
1845—	600,713	1,051,632	1,652,345
1846—	698,887	1,133,640	1,832,527
1847—	821,329	1,273,501	2,094,830
1848—	218,191	725,472	943,663
1849—	171,980	937,640	1,109,420
1850—	281,107	696,496	977,603
1851—	188,335	1,256,227	1,444,562
1852—	414,348	971,660	1,386,008
1853—	799,156	1,102,500	1,901,656
1854—	237,008	442,104	679,112
1855—	117,794	241,720	359,514
1856—	1,142,057	887,783	2,029,840
1857—	1,053,211	1,069,985	2,123,196
1858—	1,111,717	649,509	1,761,226

The above facts prove how small has been the progress of our exports by Sea from this Port of interior products, notwithstanding all our expensive Canals. The inferiority of our power with only our present facilities, to compete with Oswego and Buffalo, through the Erie Canal, will be still more marked when the enlarged Erie Canal is completed.

But it is stated by the Managers and Directors of the Grand Trunk Railway, and has been believed by many in Canada, especially by the gentlemen of the learned Professions, who compose so large a part of the Parliament and of the Government of the country, that so soon as the Grand Trunk road was connected with the Western lines, it would inevitably command the trade of the West and bring it to Montreal. I shall show that although the road has been open for several years and fully completed west, it has failed to do so, and I shall further shew that it is *impossible* for a railway to compete successfully in the carrying of heavy freight with a navigation such as on our Lakes and Rivers, and how utterly fallacious is Mr. Blackwell's project of making Portland and Quebec the great emporiums for export and import

to and from Western Canada, and the Western States, by means of a railway. Railways on this Continent are not, as in Britain, the principal and almost the only means by which freight is moved from one point to another, but are rather auxiliaries and assistants to the great water lines. They do not carry any large amount of heavy freight, but where the water lines are successful, they are then fully employed in the carrying of passengers, light and valuable goods, live stock, &c.

At Buffalo, for example, the receipts of wheat by Lake, in 1856, were 8,465,671 bushels, and by the Buffalo and Erie and Buffalo and Lake Hudson Railways, only 4040 bushels were received. In 1857, the receipts by Lake Erie were 8,334,179 bushels, and by the above roads 14,430 bushels. The receipts of flour in 1856 at Buffalo,—

	barrels.
By Lake	1,126,048
By Railroads	85,141
1857.	
By Lake	845,953
By Railroads	46,301

Receipts at Montreal in 1858,—

	Wheat and other Grain.	Flour and Oatmeal.
By Canals and Railway.....	2,194,906	670,918
By Railroad from 1st Jany. to 31st Oct...	143,544	249,519

The lines of railway between Buffalo and Albany have been aided in their competition with the Canals, by an exemption from any of the State Tolls charged on property passing through the Canals, and hence rolling and other freight easily handled, had been carried to a considerable extent still, in small proportion to the quantity moved by Canal, for instance of Vegetable food there was moved in

	1853	1854	1855	1856.
New York Erie and New York Central } Railway.	80,868	255,497	360,697	431,969
N. Y. State Canals...	1,071,300	903,735	993,175	1,153,894

Again, it is a fact well ascertained, and acknowledged by those acquainted with the management of railways in the United States and in Canada, that the actual cost of moving heavy freight by rail, is not less than one and a half ($1\frac{1}{2}$) cents per ton per mile, and that where freight is carried at a less rate than this a positive loss is the result. The distance from Chicago to Montreal by railway is 886 miles, and the cost of freight for the whole distance, at $1\frac{1}{2}$ cents per ton, is \$13.29, which for a ton of wheat ($33\frac{1}{2}$ bushels) would be $39\frac{1}{2}$ cents per bushel, or for a ton of flour of 10 barrels, would be \$1.32 per barrel. During the present season wheat has been carried by water from Chicago to Montreal at 11 cents per bushel, and flour at 50 cents per barrel, but even if we add 50 per cent. to the rates of this season, we have rates less than half of those which it would be necessary for the railway to have in order to pay. From Toronto, 333 miles to Montreal, the railway rate at $1\frac{1}{2}$ cents per ton per mile, would require to be 50 cents, and for wheat 16 cents per bushel; we all know that 6 cents per bushel is deemed a fair rate by vessel, and 25 cents per barrel on flour are deemed fair rates by vessels. From Kingston 180 miles, the railway rate should be 8 cents per bushel, and 27 cents per barrel for flour. Vessels bring wheat for $3\frac{1}{2}$ cents per bushel and flour for 10 cents. From these comparative statements, it is I think evident, that the railway cannot possibly compete with large sailing vessels in the transport of heavy and bulky freight, and that any attempt to do so, must result in a ruinous loss. I have shewn, that with our present means of transportation, we cannot move produce from Lake Ontario, down the St. Lawrence for the supply of Albany, New York, or Boston, *via* Lake Champlain, so cheap as it can now be moved via Oswego, to the same points, for the reason that as the freight from Montreal to any of the points named, is as high as from Oswego, there will be a difference equal to the cost of transport from Oswego to Montreal.

These observations seem to me to shew that the railway cannot possibly bring produce to Montreal from the interior so cheap as it can be done by water.

Having said this much, on our ability to compete for carrying

Canadian or Western produce to the great consuming markets of New England, I shall now as briefly as possible advert to the causes which make the Atlantic Ports of the United States, particularly New York, so successful in attracting through the Erie Canal so large a proportion of this produce for exportation. I have shewn elsewhere that the exports by sea from Montreal of wheat and other grain, and flour reduced to grain for this Season, is 1,761,226 bushels. The export of wheat and other grain and flour as above, from New York alone, in 1857, was equal to 21,000,000 bushels.

Now, in my opinion, this superiority of New York over the St. Lawrence arises principally from the Erie Canal *via* Buffalo and Oswego, being the cheapest route for the transport of the great bulk of Western and Canadian products intended for consumption in the Eastern States. The Western Merchant in starting his property on this route, puts it, as it were, into a groove, by which he has a chance of selling it so as to meet either the home or the export demand. If he sends it to Montreal, the home demand is small and easily supplied, he has no means of shipping it to the Eastern States, and must either ship to England on his own account or sell for shipping. If freight is too high, or if it is not desirable to ship, there exists no means of sending it to New York, Albany, or Boston, except at the loss of all the freight from Oswego or Lake Ontario to Montreal. The property must therefore be sold for shipment, and of course its value has to depend on the value in England, less freight and charges. Freight at Montreal to Liverpool up to 1854 has generally averaged 100 per cent. over the rates at New York, so that although the cost of freight from the interior to Montreal is less than to New York, yet the gain on ocean freights from New York brings the choice of routes for export nearly to an equality, both varying from time to time according to circumstances.

The position, then, in which I think Montreal can be placed, is exactly that which Oswego and Buffalo now hold in being the best outlets from the St. Lawrence route, on Lakes Erie and Ontario to New York and New England. I believe if a ship canal were opened from the St. Lawrence to Lake Champlain, so that the ves-

sel from the interior, whether from the Western States or from Canada West, could deliver her cargo on Lake Champlain without breaking bulk, a new route would be made available, by which a superiority in time and cost over the Oswego or Buffalo routes will be secured, and the great stream of trade in its passage from the West to the East removed 250 miles lower down than where its exit from the St. Lawrence is at present. This I have long held, and every one who has examined the subject thoroughly and in all its bearings coincides in the belief that such a work would inevitably result in securing, through Lower Canada, the quickest and cheapest means of transport to the Eastern United States.

Engineers who have examined the subject, and whose opinions I might quote at length, *all agree*, without dissent, that the building of a Ship Canal, to connect the St. Lawrence with Lake Champlain, would secure for Canada, through the Welland and St. Lawrence Canals, without the possibility of change, the quickest and cheapest water route, to any part of the Eastern States, for freight from the interior. Among these Engineers who thus concur, I may mention the names of J. B. Mills, Hon. H. H. Killaly, Messrs. Samuel and Thos. Keefer, Walter Shanley, Edward H. Tracey, John B. Jarvis, Colonel Swift, John Page, T. C. Clarke, J. W. Gamble, Captain John Childe, Jas. Kirkwood, and W. J. McAlpine. Every Chief Commissioner of Public Works, since the work was projected in 1846, has reported in favor of its construction. The Hon. W. B. Robinson, Merritt, Chabot and Lemieux, have written strongly in reference to the change which it would produce in the means of transit and on revenues from our Public Works. The Legislature of Canada, in 1852, by a vote of 37 to 6, passed the following Resolutions in its favor :

1st. *Resolved*,—"That from the proximity of Lake Champlain to the River Hudson and St. Lawrence, the trifling elevation of the summits which divide them, and the natural advantages the great chain of lakes and rivers leading into the interior possess, the construction of a canal to connect the St. Lawrence with the River Richelieu or Lake Champlain, of sufficient dimensions to admit the largest class of steamers from Lake Ontario to Whitehall, would materially cheapen the rates of

transportation between Lake Erie and New York, regain the trade of the West through its natural channel, and increase the revenue from tolls on all our leading Public Works."

2nd. *Resolved*,—"That an humble address be presented to his Excellency the Governor General, to communicate the preceding Resolution, and to recommend the subject thereof to the attentive consideration of his Excellency."

But on a resolution being moved to place the work on the estimates, it was decided by a majority not to do so. This result was owing to the Ottawa members suddenly changing their previous vote by the promise of the Government to build the Chats Canal, and to the influence of the Grand Trunk Engineers, who were loud in their statements that Canals could not compete with Railways.

The greatest opposition to the work of connecting the St. Lawrence with Lake Champlain has proceeded from citizens of Montreal, to which locality, in my opinion, it would be of more benefit than any other. This opposition has arisen from the decision of the Department of Public Works and of the Engineers, that the proper place for its location on the St. Lawrence is above the Lachine Rapids, at Caughnawaga, it being argued that if so located it would injure Montreal, by carrying the trade past it. I entirely differ from this view of the matter, and, for the interests of Montreal would prefer the outlet at Caughnawaga to an outlet opposite the city for reasons which I will briefly refer to. It must be borne in mind that the Canal referred to, is a public work, to be built by public money, not for any sectional advantage, but for the general public interests. In her rivalry with the State of New York for the Western trade, Canada cannot afford to depart in the slightest degree from any locality which may secure the cheapest transport. When public works are constructed on this principle, then it is left to each locality to make the most of the natural *advantages* it may possess. The public interest is deeply involved in this work. We have seen that the St. Lawrence and Welland Canals, after deducting the receipts for Tolls, have cost the Province an outlay, in 1857, of upwards of £217,000. The loss for 1857 is by no means exceptional, as it will be found that, since

1850, the annual loss has ranged from £190,000 to £230,000. It is estimated that the commerce between the UNITED STATES and WESTERN CANADA alone affords a revenue to the State of New York for Tolls, of upwards of £500,000 per annum. If not only this trade, but a share of the vast Western States' trade could be made to pass through the Welland and St. Lawrence Canals into Lake Champlain, and to the Eastern States, as the quickest and cheapest route, instead of, by Oswego and Buffalo, it is a matter too plain for argument that the public interest of Canada would thereby be vastly promoted. Having made this, as I think, clear, I shall now continue to show what effect such a work would have in diminishing the price of ocean freight at Montreal, or equalising the rates with those of New York. It will be conceded that the tonnage requisite to move the raw products of the Interior to the East, *must* always be greater, and has always been greater than the tonnage necessary to move the representative value of these raw products in merchandise of all kinds from the East to the West. This being granted, it follows that, to whatever point these raw products come to meet the merchandise from the East, at that point, there must always, in the nature of the things, be an excess of tonnage. For instance, I have shewn that Oswego and Buffalo are the Lake Ports in which the great bulk of the Western trade centres, but although the propellers and sailing vessels arrive there fully loaded with corn, wheat, pork, flour, &c., yet there is not enough of iron, steel, crockery, silks, cottons, &c., to load them all back to furnish them with return cargoes. Hence, some have to take in ballast, and others are only partially loaded. With such a supply of tonnage, freights from Oswego and Buffalo to the West are reduced to the very lowest or ballast rates, and this element in the cost of freight from the ocean Westward, has a powerful influence in attracting to New York, freight destined for the Western States. If the route was changed, as I have suggested, so that the Western vessels could descend the St. Lawrence to Montreal, or go into Lake Champlain, then there would always be at Montreal, or within call of her Merchants, any amount of return vessels, by which freights could be obtained at the same comparative rates current at Oswego and Buffalo.

In the rivalry, therefore, to secure the cheapest point for exports and imports, the obtaining at Montreal that abundant and constant supply of cheap freights, now in possession of Oswego and Buffalo, would act powerfully in attracting to the St. Lawrence, freight and passengers which now centre so exclusively in New York, and just in proportion to the extent of our power of attracting vessels with freight and passengers, up the St. Lawrence to meet the cheap Western freight, can we succeed in reducing ocean freights. The Atlantic voyage consists of two trips—one out-bound, the other homeward; and if the vessel comes out in ballast, she cannot afford to carry freight home so cheaply as the vessel which brought cargo out.

This at present is the case on the St. Lawrence, the great bulk of the ships come in ballast, and the voyage home has to make it up. At New York the vessel arrives with cargo, and can afford to carry back at a low rate.

Mr. Trautwine does not take this view of the trade on the St. Lawrence, and attributes the difference of freight to other causes, for instance, he says:—

“Now this idea of making Montreal the great transfer point of Western produce from Lake craft to sea-going vessels; and the basing of the suggestion upon the firm broad ground of the almost uninterrupted natural water-course from the very head of our great lakes to Europe, are grand and comprehensive conceptions; and the plausible minor arguments by which they are sustained, are calculated to excite our admiration, and to enlist our sympathies strongly in the cause. At first sight the position appears to be impregnable; our judgment is taken by surprise, and we are disposed to acquiesce in the assumption without cavil.

But unfortunately there exist very cogent counter-arguments, which, if they do not entirely refute and invalidate the foregoing reasonings, at least tend materially to diminish their force, and to suggest doubts respecting the practical result of their realization.

“We will briefly allude to some of the more important of these antagonistic views.

“The most formidable perhaps is the opinion entertained by many gentlemen of high commercial experience and observation, that even in the event that Western produce should arrive in large quantities at Montreal, it would be impossible to induce sea-going vessels to ascend

the St. Lawrence to receive it. The exports of purely agricultural countries always greatly exceed their imports in bulk or tonnage; usually in the proportion of 3 or 4 to 1. Foreign vessels therefore going to Montreal for this supposed accumulation of Western produce, must go *in ballast*; thus losing, as it were, one half their voyage;—whereas if they go to New York for that same produce, they can carry into that port a cargo which will be pretty sure of meeting a ready sale.

"This consideration, therefore, must weigh more heavily with the Western producer, than that of a reduction of a few cents per barrel in the charges which he may have to pay to reach the more accessible seaport, and must prompt him to prefer the other.

"If this argument be correct (and it certainly appears to me to be entirely irrefutable), then the export tonnage of Montreal must in a great measure be limited by that of her imports, and cannot be expected to augment in any greater ratio than they do: But as the population of Canada is rapidly increasing, and the demand for imported articles becoming proportionally greater, all precedent sustains us in the assumption that the exports will at least keep pace with them, although a considerable time may elapse before they will warrant any heavy expenditure for docks."

Mr. Trautwine's objections are here fairly put, and seem to him "irrefutable." Let us examine them. He says that

"This idea of making Montreal the great transfer point of Western produce from lake craft to sea-going vessels, and the basing of the suggestion upon the firm broad ground of the almost uninterrupted natural water-course from the very head of our great lakes to Europe, are grand and comprehensive conceptions; and the plausible minor arguments by which they are sustained are calculated to excite our admiration, and to enlist our sympathies strongly in the cause. At first sight the position appears to be impregnable: our judgment is taken by surprise, and we are disposed to acquiesce in the assumption without cavil."

Now, what are "the plausible minor arguments" which are given in support of making Montreal the great transfer point of Western produce, and which Mr. T. acknowledges "stands upon the fair broad ground of the almost uninterrupted natural water-course from the very head of our great lakes to Europe." I have shewn, that with the Welland Canal, adapted for vessels of only 350 tons burthen, and with no outlets from Montreal or near it by which the Eastern consuming markets can be reached, so cheap-

ly as from Oswego or Buffalo, it is impossible for property in any quantity to go below Oswego; and, by actual trade returns, I have shewn that this is the fact as regards the trade not only of the Western States, but of Canada West. These statements go beyond plausibility, and are irrefutable. I again state, that if the Welland Canal was enlarged, so that the vessels of 750 and 800 tons which now trade to Buffalo could proceed down to Montreal and to Lake Champlain, a route not only to Montreal but to all ports on Lake Champlain would thereby be secured, quicker in point of time and cheaper in point of expense than any now existing, or *than it is possible to make*, through the State of New York. This is not mere assertion. The actual comparative cost of moving produce by canal, lake and rivers, has been thoroughly investigated and the results acknowledged by such men as Messrs. McAlpine, Keefer, Shanley, Kirkwood, Clark, Killalay, Childe, Swift and Gamble, names which Mr. Trautwine will acknowledge as giving weight to any statement on engineering. Messrs. Childe Kirkwood & McAlpine declare, that with these works constructed and the enlarged Erie Canal in full operation, a ton of Western produce can be carried to Montreal at \$2.78, and to New York through Lake Champlain \$3.76, while by Buffalo it would cost \$5.30, and by the way of Oswego \$4.46.

Mr. Trautwine does not, in his Report, attempt to refute any of these statements, which are endorsed by all the other names referred to, in which I entirely concur, and which cannot, I think, be placed among "the plausible minor arguments." They constitute the basis of all the hopes I have of concentrating a large part of the Western Trade at Montreal. If incorrect, the errors should have been pointed out by Mr. Trautwine. But he has failed to do so. He has left the facts untouched. Now, what are the "cogent counter-arguments" of his own which, "if they do not refute and invalidate," at least "tend materially to diminish their force"?

Mr. Trautwine's remark "that the exports of purely agricultural countries, always greatly exceeds their imports" is exemplified in my previous statements of the surplus receipts of agricultural products in Buffalo and Oswego from the United States and Ca-

nada, compared with the exports from these ports of merchandise. The Eastern United States are largely engaged in manufacturing; they import their food from the West, and it is the surplus of such receipts after supplying this home demand as previously stated, that is exported from New York and other Atlantic ports, in vessels which, on their out-voyage bring cargo. It is by having this out-cargo, as has been before stated, that the ship at New York is prepared to carry back at cheaper rates than from Montreal. This is all true, but it must be borne in mind that the vessels coming to New York are loaded with goods, destined not for New York State alone, but principally for the Western States, and that these goods are shipped through the Erie Canal, to Buffalo and Oswego, and by this route, are at present carried to the West cheaper than by the St. Lawrence route to the West. I say at present, because as we have seen, the downward or Western trade, does not extend below Oswego on Lake Ontario. (I mean to any considerable amount,) and the cheap freights and the facilities for handling cargo there and at Buffalo, and in the United States Atlantic Ports, that give the present superiority to the Erie Canal route over that of the St. Lawrence.

Let us for a moment place the Lower St. Lawrence, with its imaginary fogs and dangers out of the question, and suppose that the irrefuted opinions of the engineers I have named are correct, and that the cheapest and quickest route by water from the Upper Lakes to New York and the Eastern States, diverged from the St. Lawrence at Caughnawaga. Would not the vessels carrying Western produce into Lake Champlain and into the Hudson, returning with the manufactures of the Eastern States, and with the goods brought by the foreign ships to New York, for distribution in the West, as they now do from Oswego and Buffalo. Now, unless Mr. Trautwine is prepared to deny the statements made by all the engineers named, it follows, that with the Welland Canal enlarged and the Canal into Lake Champlain built, for vessels of 800 tons, a cheaper route to the Eastern States would be opened up, than any now existing by any other route, or will exist even when the Erie Canal is enlarged. It is therefore evident that a large share at least of the trade would pass by that channel. Now

the Montreal merchant is seven miles from this great marine water-line at Caughnawaga, but in connection with it by a canal of equal size. With such a vast stream of trade within seven miles of him, let us enquire what grounds he has to expect any part of it.

The produce having descended the St. Lawrence as far as Caughnawaga, must as we have seen, be either consumed in the Eastern States, or shipped from Atlantic ports. This produce is partly wanted for immediate consumption, but the greatest part is stored in New York and elsewhere, and held by the merchant either for sale, for consumption or for shipment. I hold that all such produce, not immediately wanted for consumption, and intended to be held for a market, could be stored at Montreal in docks, cheaper than in New York, and would be at a point equally available to supply the Eastern demand for consumption and for shipment to Europe. Caughnawaga is distant from Liverpool via the St. Lawrence 2689 miles, and from Liverpool via New York 3375 miles, and 395 of this island navigation. According to the statements of Messrs Childe, Kirkwood and McAlpine, property from this port could be shipped by vessel at Montreal and landed in Liverpool at 17 cents less per barrel, (after a handsome allowance against the St. Lawrence route for towage) than by the way of New York. There being this saving on the voyage to Liverpool, does it not seem reasonable to conclude that there would be an equal saving on the freight of goods destined for the Western States, coming through the St. Lawrence. In *distance* to Chicago the saving from Liverpool would be 689 miles. The ship coming to Montreal could transfer her cargo, with the Lake vessel, making only one transshipment against two by the way of New York, with 103 miles of canal navigation, against 211 miles by the New York route through Lake Champlain. In *time* also, the advantage on both the up and down voyage is very much in favour of the St. Lawrence route. On the Erie Canal the voyage from Buffalo to the Hudson, occupies about thirteen days, while Montreal can be reached from the Welland by propeller in four, and by sailing vessel in six days. If the Champlain route was in opera-

tion, Montreal would then have a command of the low freight Westward for the cargo of the ocean vessel coming up the St. Lawrence. What then is to prevent the import of the whole supplies for Western Canada and for the Western States, through the St. Lawrence. Imports from abroad are admitted to entry for customs duty at the ports on the Western Lakes on the same terms as at New York, namely, direct import with American Consul's certificate, and I see no obstacle to prevent branch houses from Montreal and Quebec being established in Chicago, Milwaukee or elsewhere, and imports made through the St. Lawrence for their supply. At present, with Oswego, the largest port on the Lakes, from which the Eastern States can be supplied, it is impossible that this trade can be done. The Government of Canada too, have aided the American merchant to compete with the Canadian merchant by a system of specific duties, while the American Government adopt the *ad valorem* system. The system, of specific duties although false in principle, is still in force. It obliges importers to pay a high duty on common goods, and on the highest priced goods the lowest duty. Nor is this all. Specific duties are almost exclusively charged on articles of bulk and weight, and it is bulk and weight we so much want, to give cargo to the outward ship, and thus furnish return cargo to the interior vessel. It will be found that the weight of the goods on which specific duties have been charged, will average for the last three years 50,000 tons, more than equal to the whole of the tonnage of sailing vessels from sea to Montreal in 1858, of these goods paying specific duties in 1857, £1,087,826 came from the United States, and only £276,724, from Great Britain, the British Colonies and other Foreign Countries.

One of Mr. Trautwine's cogent counter-arguments against the St. Lawrence route, and of course against any Docks, is "the high rates of insurance incident to the navigation of the River and Gulf of the St. Lawrence." On this point I deemed it best to write a note to Mr. Hart who has acted as the agent in Canada, for the "Sun" and other Marine Insurance Offices in New York for several years, and the following is his reply:—

MONTREAL, 4th December, 1858.

"Your letter calling my attention to Mr. Trautwine's report, and remarks on the subject of Insurance by the St. Lawrence route, I have to acknowledge. This gentleman depends a good deal on hearsay, and the old bug-bear of the dangers of the St. Lawrence, seems to have been one of his strong points against the successful use of the St. Lawrence route.

Some 8 or 10 years ago the rates of premium on the St. Lawrence were about double the rates now paid, and the cause was very apparent. Then, any vessel that could float was employed, in the St. Lawrence timber trade, and if, by any representation, this class of ship could get insured, it most probably ended in a sale of the vessel to the Underwriters; therefore the frauds practised on the Underwriters were put down as losses from the dangers of the St. Lawrence Navigation. What are the facts? As you and others know, the rate at present between May and October, is the same premium as charged from New York and other Atlantic ports of the United States. In October and November the rates would average double those charged from Atlantic United States ports, but when you take into consideration that the improvements on the St. Lawrence of Light Houses, Tug Steamers, Harbours of Refuge, have all been brought to bear within the last 5 years, the losses now by the St. Lawrence are reduced perhaps to the lowest per centage, taking the number of ships from the port of Quebec as compared with New York or Boston.

Out of a fleet of about 1200 vessels that cleared from Quebec this year, we know of but *eight* losses, a new ship and two old ones in the Gulf of the St. Lawrence, the other five were abandoned *at sea*, (out of the Gulf of the St. Lawrence) no doubt old and poor craft. I am convinced that a reduction by the St. Lawrence routes, on the October and November rates of Insurance, will be made for the coming year, and from my experience, feel satisfied that the winter rates of premiums from the Atlantic Ports of Britain or the United States, will be as high, if not higher, than those to be charged from the St. Lawrence for October and November risques, within next three years.

The Underwriters are now finding out that the best passages and finest weather for leaving the St. Lawrence, are between the 15th of October and 15th of November, avoiding the gales generally prevalent between 15th September and 15th October on the Atlantic.

Yours Truly,

THEODORE HART.

The following is the evidence of Captain C. L. Armstrong, at present Superintendent of Lake St. Peter Works, lately Insurance

Agent for the New York offices at Quebec, and thoroughly acquainted with the whole of the Gulf of the St. Lawrence, as given to Messrs. Childe, McAlpine and Kirkwood, but not before published :—

Navigation below Quebec, opens about the twenty-second of April, that is for ships from Europe.

A small craft came up to this port as early as March.

I crossed in an open boat on the 26th of March, 1856, between St. Flavien and the Manicouagan Shoals (about one hundred and seventy miles below Quebec), a distance of fifty-five miles.

I have had a good deal of experience, as commander of ships below Quebec, and as to fogs in the Gulf of St. Lawrence, below Quebec, have to state that the river and gulf, to the north of Newfoundland and Gaspé, is much more free of fogs, than on the coast of Nova Scotia and New Brunswick, and there is no reason whatever why the whole route to sea from Quebec, should not be made as safe as the route to Europe from the Atlantic ports, provided that lights could be constructed on Bird Rock, Cape Augille, nine lights in the Straits of Belle Isle, Manicouagan Shoals, Onehetedan, Cape Chat and Metan, on the Brandy Pots, and one on Hare Island Reef, Kamouraska, Crane Island, two leading lights at Berthier, and one on Point St. Lawrence.

The Gulf, above the Straits to the Port, is generally clear of fogs, while the whole coast in the straits and above, abound in natural harbours, up to this time but little known.

The general time of a sailing ship from Quebec to Liverpool, is about twenty days ; and the same ship, in my opinion, would take two or three days longer from Boston, and about five days longer from New York. I mean in the voyage from Quebec through the Straits of Belle Isle.

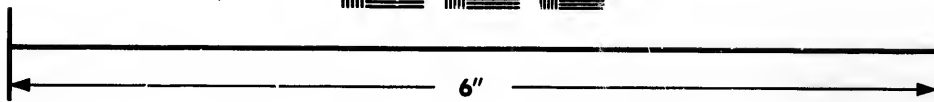
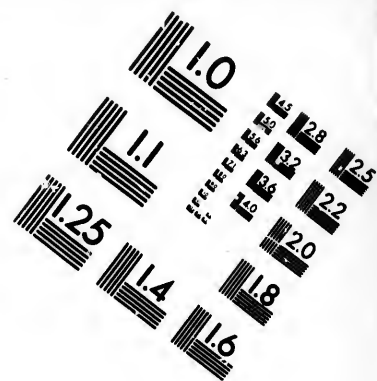
No more expense is incurred to navigate the route from the St. Lawrence than from New York or Boston, except Insurance, which is the same during the summer months, but after the middle of September the rate advances, and there is a difference between the latter part of November, against the St. Lawrence of about thirty to forty per cent. ; but this difference ought not to exist, and will not in my opinion exist, when the St. Lawrence below Quebec is properly lighted ; but this difference does not exist to the same extent as regards steamers.

The towage of a ship from Quebec to Montreal, of fifteen hundred tons, drawing eighteen and nineteen feet, will cost £62 10s., and one-third of this amount less, towed down.

Vessels often save towage by sailing down,—about one-third of the vessels sail down without towage.

It is cheaper to tow fifteen hundred tons in one vessel than in several :





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the cost, in my opinion, would be fully one-third less, or nearly one-half.

The rates of towage would be lessened very much by an increase of the number of ships requiring to be towed.

Fifteen years since, the rates of towage were much higher than at present, in consequence of the want of competition and the small number of vessels to be towed.

An inducement for vessels to be towed down, is the fact that only half pilotage is charged for vessels in charge of a steamer.

That he was acquainted with the route through the Gulf of St. Lawrence, and Straits of Belle Isle; that it was clear of shoals, and was generally preferred by all the Captains to whom it was known.

Up to the present time this channel, by the Straits, is in its natural state.

It abounds with natural Harbours of Refuge. It is eighteen miles wide at the entrance, and nine miles at the narrowest place, and is about fifty miles long.

It is now proposed by the Government to light the whole Gulf throughout so that Navigation may at all times be within view of some of these sights.

Fogs are not at all prevalent on the North shore of the Straits, and along the coast of Labrador, although more or less so on the rest of Newfoundland.

Vessels can occasionally leave Quebec on the first of April; steam vessels could come up to the River du Loup by the first of April, and there discharge freight for Canada. The Railway is now completed forty miles below Quebec, and is proposed to be extended one hundred and ten miles.

The Spring tides at Quebec are twenty-two feet, and the neap tides fourteen or fifteen feet.

The Trinity Board of Quebec also gave the following evidence on the same subject :—

The voyage to and from Quebec and Liverpool has, unfortunately for the Canada trade, been too long considered both difficult and dangerous in comparison with that of the Atlantic ports in North America, but practically it is believed, the facts do not bear out that opinion.

The Gulf and River have been carefully and accurately surveyed, the chains are good, the soundings well noted, the lights (being greatly increased in number) the buoys, beacons and signal guns are all advantageously placed, and taking a fair average of the losses by way of the St. Lawrence, it may be found that they are not greater, but rather of less extent, with reference to the number of ships employed, than the losses on the coast and approaches to the Atlantic sea-ports.

Take one instance in point. A most extensive ship-owning house, who are their own underwriters, only lost two ships during eleven years, out of 406 owned by them, engaged in the Quebec trade.

The river risks are also greatly lessened upon such sailing ships as avail themselves of the powerful tug-steamers, now plying on the Lower St. Lawrence.

Harbours of Refuge are not required, the sea-room below the Island of Bic being ample, and the anchorage under the lee of that island offering sufficient security for vessels seeking shelter there in stormy weather.

Old Bic harbour might be improved by piers and a wharf, so as to enable the steamships and sailing vessels to discharge cargoes there in the month of April, so soon as the railway now in progress is completed to Rimouski; thereby enabling merchants in the west to get their goods and ship their produce a month earlier in the Spring, and nearly a month later in the Fall, than they now do.

From Quebec westward the internal improvement in aid to the vast expanse of lake and river navigation, are of such extent as to afford every facility for the employment of any number of propellers or sailing vessels, as the trade may require.

The advantages of the St. Lawrence route for goods and passengers, as compared with that by the Atlantic Ports, are obvious: the distance is shorter, one-third of the voyage is comparatively in smooth water, and it is less costly; it needs only a glance at a map to see that the 700 miles from Quebec to Belle Isle are through a land-locked channel, and admitting that the rates of passage by steamer whether from Liverpool to New York, or Boston, or Liverpool to Quebec, were about equal, the great gain to the emigrant would be from Quebec to the West, supposing his destination to be Chicago or Wisconsin, he would be transported with his family, either by rail at \$7 per adult, or by propeller at \$4 per adult; whereas from the Atlantic ports, he would have to proceed by rail to Buffalo, and thence by steamer at \$8½ per adult, or by rail to Chicago, at a cost of \$10 per adult.

Mr. Trautwine says:—

Another argument against the possibility of securing this monopoly, is the fact, that the harbors of New York and Portland are open and accessible during the entire year, while that of Montreal is annually closed by ice for five months. Constancy and regularity are rapidly becoming more essential features in the transaction of heavy commercial operations between distant countries, and neutralize to a great extent the advantages which attach to long water communications subject to so serious a drawback as an entire suspension of business for five months annually. The business connections which must necessarily concen-

trate upon New York and Portland the great bulk of Western commerce during nearly one-half of the year, cannot be suspended and renewed periodically in favor of Montreal during the other half.

I hold a contrary view to this, and state that the Port of New York, or any other Atlantic port, is as effectually closed to Western trade by the cold of winter as is Montreal or Quebec. On this point Messrs. Childe, M^cAlpine, and Kirkwood wrote as follows :—

The more Northern portion of the St. Lawrence route may lead to the assumption that it remains closed by ice later than the New York routes. But such is not the fact. The great body of water passing down the St. Lawrence, and its derivation from the Upper Lakes, the waters of which never attain the low temperature of the streams within the same region of country, seems to more than compensate for the more Northern latitude of this route.

The Tables in the Appendix will shew the dates of the first arrivals of sailing vessels at the Port of Quebec (indication of the Riv^{er} being free of ice), and the dates of the opening of the Port of Buffalo, and of the navigation upon the Erie and the Canadian Canals. (i)

The first has been furnished by the Trinity Board at Quebec, and the others have been taken from the report of the Canal Commissioners of the State of New York, from the Reports of the Canadian Board of Works, and other official reports.

The following is the Table referred to above, and is the result of a careful compilation from official data :—

TABLE of the dates of the opening and closing of the Navigation on the Western Lakes, and on the New York and Canadian Canals, and St. Lawrence, from 1847 to 1857.

No.	—	1848.		1849.		1850.		1851.		1852.	
		Opened.	Closed.	Opened.	Closed.	Opened.	Closed.	Opened.	Closed.	Opened.	Closed.
1	Straits of Mackinaw	April 11	.....	April 10	.....	April 2	.....	April 2	Nov. 30	May 2	Dec. 8
2	Port of Hamilton	Febr. 28	Dec. 25	March 28	Dec. 26	do	do	Nov. 22	Dec. 24	April 22	do 31
3	do Buffalo	April 9	.....	do 25	.....	March 25	.....	April 2	.....	do 20	.....
4	do Oswego	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
5	do Montreal	April 18	Dec. 22	April 17	Dec. 9	April 16	Dec. 11	April 13	Dec. 6	April 28	Dec. 21
6	do Quebec	May 2	Nov. 21	do 28	Nov. 22	do 28	Nov. 30	do 20	Nov. 25	do 15	Nov. 25
7	do Bic	.....	.....	.....	Dec. 19	March 18	Dec. 19	March 15	Dec. 20	.....	.....
8	Erie Canal	May 1	Dec. 9	May 1	do 5	April 22	do 5	April do	do 5	April 20	Dec. 15
9	Welland Canal	.....	.....	.....	.....	do 1	do 12	do do	do 12	do 13	.....
10	Cornwall Canal	April 11	do. 8	April 13	do 6	do 20	do 7	do 25	do 5	May 1	Dec. 16
11	Lachine Canal	do 24	do. 11	do 21	do 8	do 27	do 10	do 23	do 10	do 10	do 10

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TABLE of the dates of the opening and closing of the Navigation,—Continued.

No.	—	1853.		1854.		1855.		1856.		1857.	
		Opened.	Closed.	Opened.	Closed.	Opened.	Closed.	Opened.	Closed.	Opened.	Closed.
1	Straits of Mackinaw	April 11	Dec.	9 April	24 Dec.	9 April	26 Dec.	3 May	1 Dec.	8 May	1 Dec.
2	Port of Hamilton...	do- 5	do 30	do 4	do 18	do 14	do 24	April 21	do 18	April 4	January 31
3	do Buffalo....	do 14	.....	do 11	d.	6	do 21	do 14	May 2	do 12	May 13
4	do Oswego....	Feb. 27	.....	Feb. 28	.....	Mar. 19	.....	April 15	.....	April 2	.....
5	do Montreal...	April 18	Dec.	18 April	26 Dec.	6 April	30 Dec.	12	do 24	Dec. 13	do 18
6	do Quebec....	do 24	Nov.	do 20	Nov.	29 May	6 Nov.	22 May	29	.....	.....
7	do Bic.....	.....	Dec.	20 March	18 Dec.	19	.....	.....	.....	.....	.....
8	Erie Canal.....	April 20	do 15	May 1	do 3	May 1	{ Dec. 5 do. 10 }	May 12	Dec. 10	{ May 6 do 13 }	Nov. 23
9	Welland Canal....	.....	.....	.....	.....	April 16	do 12	April 26	do 13	.....	Dec. 15
10	Cornwall Canal ...	April 29	Dec.	4 April	30 Dec.	10 May	1	do 9	May 2	do 2	May 1
11	Lachine Canal.....	do 30	do 15	May 1	do 5	do	do Nov.	30	do 1	Nov. 29	do 4

"The mean for the last ten years, as derived from these tables, is as follows :

	Opens.	Closes.
Straits of Mackinaw	April 14	December 6
Port of Hamilton.....	do 1	do 28
Do. Buffalo	do 14	do 14
Do. Oswego.....	March 20	.. ..
Do. Montreal	April 20	December 11
Do. Québec.....	do 29	November 24
Do. Bic	March 16	December 19
Erie Canal.....	April 28	do 7
Welland Canal.....	do 8	do 12
Cornwall Canal.....	do 25	do 8
Lachine Canal	do 28	do 8
St. Lawrence River, between Lake		
Ontario, Montreal, and Lachine .	do 26	do 7
Do. between Montreal and Quebec.	do 24	do 10

"Taking into account the difference in time between the voyages from Lake Ontario to Albany or Quebec, and the dates of the opening of navigation on the two routes, it appears that the navigation is open about five days earlier and is closed about one day later on the St. Lawrence route than it is on the Erie Canal."

It is thus evident that the Welland Canal has, on the average of the last ten years, been open to commerce twenty days earlier and five days later than the Erie Canal, and that the port of Montreal is also open eight days earlier and four days later on the average of these ten years than the Erie Canal, so that the only communication after the close of navigation which Portland, Boston, and New York can have with the West or Western Canada is by railroad; and Montreal is nearer, on an average, to all these cities by rail than either Oswego or Buffalo.

In these remarks on the capability of the St. Lawrence to compete with the routes through the State of New York, I have contended that the port of Montreal can be made the cheapest and best point for the transfer between the ocean and the interior vessel. Mr. Trautwine demurs to this view, as the following extracts will show :—

"Again, it is urged against docks, that there is no special reason why the Lake propellers should not pass through the outlet lock of the

Lachine Canal at Montreal, and continue their voyage down the St. Lawrence to Quebec, there to meet the sea-going vessels; instead of requiring the latter to ascend the river to Montreal to meet the former. It is true that neat calculations have been made, which seem to show a slight preponderance, on the score of economy, in favor of the large steam-vessel going up and down, over two of half her tonnage going down and up. But the difference would in itself be too trivial, to constitute in itself much more than a theoretical argument in favor of docks at Montreal."

"Again, the completion of the Victoria Bridge, for carrying the Grand Trunk Railway across the River St. Lawrence at Montreal, will open to that railway an uninterrupted line from Canada West to the seaport of Portland in Maine, and to Quebec. The effect which this road has already produced upon the Lake Craft, driving many of them out of the business of transporting Western produce to Montreal for foreign shipment, gives every reason to suspect that when the Victoria Bridge shall relieve the Company from the necessity under which it now labours, of placing their freight on barges, and towing it across the river, a much greater proportion of Western produce will be carried by it past Montreal to Portland and Quebec; perhaps so much more as to retain Montreal nearly in her present condition, or at least to prevent that rapid increase in her commerce which many predict. Such of it as is put upon the railway at points westward from Montreal, and destined for shipment to Europe by way of the St. Lawrence, will certainly not stop in Montreal, when in a few hours it can be carried to Quebec, 180 miles further."

In the opinions thus expressed, Mr. Trautwine is supported by Mr. Blackwell, the representative in Canada of the Grand Trunk Company, who states in his Report of last September to the London directors:—

"The lower sections of the line, from Montreal to Point Levi, St. Thomas, and Portland, may be said to call for no special remarks, excepting their want of connection by means of the Victoria Bridge with the western section. This link is so essential, that no correct estimate of the through traffic can be formed until it is completed, and without it we shall never be able fully to take advantage of the great facilities which will be afforded to Quebec shipping on the completion of the Point Levi docks, to load and unload Western goods and products. These extensive works, together with the wharves of Messrs. Forsyth & Co., and the additional accommodation we are of affording the ocean steamers at our wharves, will undoubtedly be the means of securing to

Western-bound traffic which at present finds its way up the St. Lawrence to Montreal, so soon as our freight trains can cross the river at Montreal without break of gauge or bulk."

These are statements which affect not only local interests, but the interests of the Province; for if true, it would appear that our intercommunications need not be improved, that docks are unnecessary at Montreal, and that, when the Victoria Bridge is completed, the great bulk of the Western trade will be carried by railroad past Montreal to Quebec. I have in another place demonstrated by facts the utter impossibility, during the summer season, (when freights rule at from 11 to 16 cents per 60 lbs. of wheat from Chicago, or in the same proportion at other places,) for the railroad to compete in heavy freight with the sailing vessel to Montreal. Now let us examine how the facts bear out the views of Mr. Trautwine and Mr. Blackwell as regards the power of the Quebec and Portland railways to compete with the ocean and river vessel from Montreal in the transport of produce and merchandise.

I have before stated that it is a received opinion among railway engineers and managers that to make any profit whatever in the carrying of heavy freight by railway, it is imperative that at least $1\frac{1}{2}$ cent per ton per mile should be received. The correctness of this principle has been acknowledged by the Grand Trunk Company in their refusal to take a less rate for flour to Portland than 45 cents per bbl. from Longueuil. I have myself sent over the Portland railway upwards of 100,000 bbls. of flour, and in no instance could I get the rate reduced below 45 cents, the agents affirming *that it was impossible to take it less*. The distance to Portland is 292 miles, which at $1\frac{1}{2}$ cents per mile would be 44 cents per bbl. of 10 bbls. to the ton. The distance to Point Levi, opposite Quebec, is say 180 miles, so that for every barrel carried to Point Levi it would be requisite to receive 27 cents to save from loss; and for every ton of goods upwards the rate would require to be \$2.70. For wheat, at $33\frac{1}{2}$ bushels to the ton, the rate would require to be 8 cents per bushel.

The following letter from Messrs. L. Renand & Frère, copied from the Appendix to Messrs. Childe & M'Alpine's Report, shews

that flour is carried by river craft from Montreal to Quebec at 6½ cts., and wheat and other grain at 2½ cts. per bushel. The rate of insurance between Quebec and Montreal does not at any time exceed one half per cent.

MONTREAL, 13th November, 1857.

"As to the freight from Montreal to Quebec on Flour and Wheat, we have to say that the same is lower this year than we have ever before known it in our experience.

The lowest freight for Flour to Quebec by barge (usually of 150 tons) this season, has been 6½ cents per barrel of Flour, and for Wheat and other grain 2½ cents per bushel. By steamers of 750 tons, such as navigate the Upper St. Lawrence, or by the Mail boats, the rate has been usually 12½ cents on Flour, but very little grain is sent by this mode of conveyance, but is carried generally at proportionate rates to Flour. We had three barges engaged in the Quebec trade; the lowest freight this season of Coal and heavy goods has been 5s. 6d. per chaldron, up, and the highest 7s. 6d., or about 6s. on an average, while occasionally we have had as much as 10s. for bringing Coal from Quebec, per chaldron.

(Signed) L. RENAUD & FRÈRE.

P.S.—The rate of Freight on Flour and Wheat, as above by barge, is exclusive of towage, which is about £12 10s. for a barge of 150 tons.

L. R. & F.

The following statement of the *actual* expenses between Montreal and Quebec, of a ship of 1013 tons burthen per register, was furnished by Andrew Shaw, Esquire:—

Ship "Pride of Canada," 2nd Voyage, 1856.

	£	s.	d.	£	s.	d.
Lake dues downwards, ½ 1013 Tons 9d.,				37	19	9
Pilotage down,				5	7	6
Towage to Quebec,				35	0	0
Lighterage,	51	0	6			
Do.,	15	0	0			
Do.,	35	0	0			
				101	0	6
Ten days' Wharfage, 1013 1s. 4d.,				10	11	0
				£189	18	9

Quebec at 6½
The rate
at any time

On board leaving Montreal, Minots Corn, 31950
Draft 15, 8½ feet,
Lightered and taken on board at Quebec, 14116

46066

ber, 1857.

In all 46066 Minots Corn delivered in England 5942 Quarters.

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MONTREAL, 13th November, 1857.

of 150 tons)
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Lake dues upward, £37 19 9
Pilotage up, 8 5 0
Towage from Quebec, 90 0 0
Wharfage, 10 11 0

£148 15 9

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The cost of moving the 31950 bushels was as near as possible 2 2-5 cents per bush., and as the channel is now deepened, so that the whole 46066 bush. could be taken on board at Montreal, the cost would now be 1 3-5 cents per bush.; and on the up freight, supposing the 1013 ton ship to carry in dead weight only 1150 tons, the cost would be 56 cts. per ton, the freight by sailing vessels would stand thus:—

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L. R. & F.

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TO PORTLAND.

TO QUEBEC.

	Wheat per bush.	Flour per brl.		Wheat per bush.	Flour per brl.
	c.	c.		c.	c.
By railway,.....	13	44	8	27
By river craft,	2½	6½
By ocean ship,	1½	5½

£ s. d.

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Even if these rates by water were doubled, still the railway could not compete. The same difference exists as to up freights.

The cost of bringing ocean steamers up to Montreal is shewn by the following statements, furnished by the agents of the several vessels, and all go to shew the superiority in cheapness of these vessels coming to the port of Montreal, which, of course, will be still further increased if the Lake dues are abolished and the necessary facilities for loading and discharging created.

*Steam Ship "Caledonia," total measurement 1000 tons Register. Tonnage 798 (deducting engine room), Quebec to Montreal and back.

QUEBEC TO MONTREAL.

Pilotage upwards,.....	£18	0	0
Wharfage, 798 tons—3 days at 1d.,.....	8	6	3
Lake dues—798 tons upwards, at 9d.,.....	29	18	6
Coal consumed (supposed), 20 tons, at 20s.,.....	20	0	0
	£74	4	9

MONTREAL TO QUEBEC.

Pilotage downwards,	10	15	0
Wharfage, 798 tons—5 days at 1d.,.....	8	6	3
Lake dues—798 tons downwards, at 9d.,.....	29	18	6
Coals consumed, 15 tons, at 20s.,.....	15	0	0
	£63	19	9

RECAPITULATION.

Expenses upwards,	74	4	9
Do. downwards,.....	63	19	9
	£138	4	6

STATEMENT of certain expenses incurred by bringing the Steamers belonging to Montreal Ocean Steam Ship Company above Quebec, on an average of three voyages in 1856, when the water in the river enabled them to come up, drawing 15 feet 3 inches :—

Pilotage above Quebec, up and down.....	£ 27	0	0
Lake dues.....	87	10	0
Wharfage at Montreal	24	10	0
Small Steamer, assisting out of harbour	6	5	0
Lighterage up, £125; Lighterage down, £100.....	225	0	0
Coals consumed up and down	100	0	0
	470	5	0

NOTE.—One of these Steamers arriving at Quebec, with a full cargo, has on board about 1000 tons goods; of which, on an average, there may be 200 tons for Quebec, 400 tons for Montreal, and 400 tons for places west of Montreal. She then draws 17½ feet water, and after discharging the Quebec goods we have to lighten up 320 tons, at a cost of 7s. 6d. per ton, and downward the same, at about 6s. per ton.

(Signed,)

EDMONSTONE, ALLAN & Co.

Montreal, 23rd November, 1857.

* Furnished by H. L. Routh & Co.

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£63 19 9

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These are something more than "neat calculations," and, to my mind, are conclusive that, even when the Bridge is finished, produce (if we had it to send,) cannot be carried by rail, either to Portland or Quebec, for shipment by sea, so cheap as it can be done from Montreal; and from the relative freight above Montreal being higher than below Montreal, where the competition of the ocean ship begins, it is not probable that it will be found cheaper for the interior vessel to proceed to Quebec.

In proof of this position I give the following statement from the three largest and oldest forwarding houses in Canada, as furnished to Messrs. McAlpine, Childe & Kirkwood:—

The undersigned, who are largely engaged in the forwarding business between the Upper Lakes and Ports of Montreal and Quebec, do hereby certify, that the rate of freight from Quebec to Montreal by sailing vessels, for heavy goods, has varied this season from one dollar to eight shillings per ton, while the rate for grain, from Montreal to Quebec, has been from 2½ to 3 cents per bushel, and for flour five and a half to ten cents per barrel.

The rates for some years back have not varied much from the above.

Although we occasionally are compelled to send our steamers with freight to Quebec, we do so with reluctance, finding, as we do, these rates of freight unremunerative. Out of many strong grounds of objection to that port, we merely state a few, viz:—The detention caused by the limited accommodation for loading and discharging at suitable wharves; the great detention from the tidal hours, and the serious risk of grounding at low water.

We find that our freight steamers occupy nearly as much time in a trip from Montreal and Quebec, and back to this place, as hence to Toronto and back; while the earnings of the steamer during that time, will not exceed one-third the amount gained by her on the latter trip.

The freight from Quebec consists chiefly of salt, coals, railway iron and fish, articles which require nice calculation to avoid loss to the importer and forwarder, leaving but a very narrow margin for profits. The freight to the interior being necessarily low, prevents the loading of steamers with such freight except in part; and hence it is that they cannot visit profitably a port where only freight of that description can be had. Sailing craft, which are run at less expense, are consequently employed between Quebec and this place; and such is the uncertainty of the traffic, that in part of the months of May, June, September and October, the simultaneous arrival of a few ships laden with freight of the above description, caused the advance of freight by river craft from

Quebec to Montreal of from fifty to seventy-five per cent. As no foresight on the part of the importer or forwarder, who contracts for the freight through, can guard against such occurrences, they lose heavily by the advance of freight beyond its average range.

In confining ourselves to the foregoing remarks, we trust we have said enough to shew that steam-vessels, or others adapted to the trade of the interior, cannot go below Montreal for freight at unremunerative rates.

(Signed,)	HOOKE JACQUES & Co.,
"	JONES, BLACK & Co.,
"	HENDERSON & HOLCOMB.

MONTREAL, 19th November, 1857.

I have no doubt Mr. Blackwell will change his opinions in reference to the cost of transport between Montreal and Quebec after a longer residence in Canada; but it is much to be regretted that it should be gravely asserted in an official document, by a gentleman at the head of such a line of railway as that of the Grand Trunk Railway of Canada, that its success depended on the completion of the Point Levi docks, Messrs. Forsyth & Co.'s wharves and the Victoria Bridge. I predict that when all are finished, in the absence of other works, this railroad will be as powerless as it is at present, in attracting any considerable portion of that great stream of traffic, which flows past Lower Canada, into the United States, over the Suspension Bridge, and through the State of New York.

If the *whole exports* from Montreal in 1858 of wheat, pease, oats, corn, barley, flour, oatmeal, beef, pork, lard and butter, were carried by railway to Quebec, even at the rate of $1\frac{1}{2}$ cents per ton per mile, the whole amount of gross receipts would only be £41,941; a sum wholly insufficient, even including other receipts, to pay interest on capital invested in the 180 miles to Quebec, and supposing the road to cost only £5000 per mile. The success of our Canadian railways is dependant, in my opinion, on a totally different line of policy; and, strange as it may seem, on the success and superiority of our water-lines of transport over those of the State of New York. I have shewn that the great flow of trade from the Western States and Canada West is through the Erie Canal, from Buffalo and Oswego. The railways running parallel with this line of navigation are the

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most successful on this continent; and although they carry but little of the heavy freight, yet they are fully employed, carrying light and valuable freight—hogs, cattle, and sheep—which can afford and pay a much higher rate of freight than flour, wheat, &c., that are moved by sailing and steam vessels. Passengers follow the stream of trade; and, while the railway lines from Buffalo and the Great Western Railway passing over the Suspension Bridge are crowded with passengers, the Canadian or Grand Trunk line below Hamilton is comparatively deserted. The same foresight which expects such wonders to result from the Point Levi docks, Mr. Forsyth's wharves, and the completion of the Bridge at Montreal, also anticipates enormous results from connecting the Grand Trunk Railroad with Michigan Roads opposite Sarnia. These may pay from being in the American line of business, but they will prove merely feeders to the great New York lines, and fail in any way to attract freight or passengers below Hamilton. And this state of things must, in my opinion, *continue* until, by the enlargement of the Welland Canal, the improvement of the Rapids of the St. Lawrence, and the construction of a canal into Lake Champlain, Montreal is made a depot, where Western produce can be stored and held, for shipment to New York, Boston, Portland, the Lower Ports, Britain, or elsewhere. I have attempted to shew, and have supported my views with the testimony of eminent Engineers, (always excepting Mr. Trautwine), that with these works completed, property from the West could be laid down at Montreal at less cost than at any other point, for export by sea, or for distribution to the Eastern States, and that imports could be sent to the West via Montreal cheaper than is possible by any other route. In the proportion, therefore, as we succeed in making the great water-lines through Canada to Montreal and Lake Champlain superior to those of New York, just to the same extent will be the success of our railway system; and, while the sailing-vessel and propellor might be employed in carrying the heavy and bulky freight, the railways in Canada would be employed, as they are through New York, in the transport of freight which can afford to pay higher rates than by

water, and passengers from Canada West and the Western States would come to Montreal as a centre of trade, instead of going as they now do almost exclusively to New York and Boston. My strong conviction is, that the strength and influence of the Grand Trunk Company, instead of being wasted and worse than wasted on the construction of docks and wharves which can have no perceptible effect in increasing the revenues of the Company, should be concentrated in urging upon Government the absolute necessity of at once proceeding to enlarge the Welland Canal, and to connect the waters of the St. Lawrence with those of Lake Champlain, and of giving every aid they can for constructing docks at Montreal. Until this is done, disappointment will follow disappointment, notwithstanding the great facilities which will be afforded by the completion of the Victoria Bridge.

If these views are, as I believe them to be, sound and based on ascertained facts, then an amount of trade, with these works completed, would be attracted to Lower Canada, for which the accommodation in the harbours of Quebec and Montreal is totally inadequate. In 1852 the total number of vessels which arrived in Montreal was 192, and the gross tonnage 46,079, or an average of 240 tons each. In this year the arrivals are 191, of a gross tonnage of 70,183, or an average of 368 tons. This increasing size of vessels coming to the port requires more space, which will render additions necessary even for the present limited commerce. There are no facilities in the harbour, similar to those existing at Oswego and Buffalo, for handling grain, flour, &c. At these two points there are no less than 22 elevators, capable of storing 4,180,000 bushels of grain, with a capacity to receive, *per day*, 750,000 bushels. In the harbour of Montreal we have no elevators, and cannot have any. In the Lachine Canal we have only two, of a united storage capacity of 125,000 bushels.

In view, therefore, of our present wants, and under the belief that the Government of Canada will not fail to construct works so essential to the progress of the country, as I have pointed out, as well as from a conviction that docks at Point St. Charles can be constructed without adding any increase to pre-

sent harbour dues, I shall proceed to examine the opinions offered by Mr. Trautwine on this subject, and correct what seem to me his erroneous conclusions.

The Harbour Commissioners of Montreal, conceiving that further harbour accommodation would in a few years be required, of a character different from what it was possible to obtain in the present port, and in magnitude corresponding with their improved channel from Montreal to Quebec, deemed it their duty as early as 1852 to cause surveys to be made of all the various localities, first by Messrs. Gzowski & Keefer, next by Mr. Forsyth, then by Messrs. Childe, McAlpine & Kirkwood. The whole of these gentlemen reported strongly in favour of making the improvements at Point St. Charles. In this opinion the Harbour Commissioners concurred; and in this opinion also the Montreal Board of Trade, at a special general meeting called to consider this subject, concurred.

The following is an extract from a letter addressed to the Harbour Commissioners from Commander Orlebar, R.N., and Admiralty Surveyor, when sounding the river and harbour this season

"The very great improvements that the Harbour Commissioners have originated and completed;—the deepening of the channel to more than eighteen feet; the increased number of lights and buoys—all make it the more important to have Bayfield's survey of the river revised and speedily published, so that the public may know more generally the character of this noble river above Quebec, and its capabilities for the safe navigation of vessels of large draught. I think it is also required in connection with the vast improvements yet contemplated in the Harbour accommodation of Montreal; and when published will, I hope, convince the most sceptical that the proper terminus of the ocean trade is the city and harbour of Montreal; and that sound policy as well as a regard to their essential interests should urge the people of that city to the early extension of accommodation for the greatly increased amount of tonnage that will eventually frequent their Harbour.

"With the plan of the Montreal Harbour before me, and the Victoria Bridge in sight, I cannot hesitate in saying, the situation marked out for docks is the shoal flat extending from near the mouth of the Lachine Canal to the Victoria Bridge; and I cannot believe that much time will elapse before the harbour of Montreal shall possess that great desideratum of an enterprising mercantile community—a dock of sufficient extent to receive their shipping."

A very considerable number of citizens, however, principally residents at the east end of the city, were opposed to the construction of docks at Point St. Charles, and being seemingly in favour of a dock carried through the property of the Ladies of the Grey Nunnery, across McGill Street, and through the College property, the Harbour Commissioners invited a number of these gentlemen to meet them, which resulted in Mr. Trautwine of Philadelphia being called to survey and report upon the matter. "It seems, however, that this plan through the Nunnery and McGill Street has been abandoned, as it is not even referred to, and a totally new scheme projected, the idea of which belongs exclusively to Mr. Trautwine. There was first a project of what may be called "The Hochelaga Docks." In reference to this, Mr. Trautwine concurs with the other Engineers who had previously examined it, and condemns it as too costly and too distant from the business part of the city.

The next scheme was that called the "Viger-Square Docks," and Mr. Trautwine also concurs with the parties who had, under directions of the Harbour Commissioners, examined it, remarking as follows :—

"So thoroughly convinced am I of the entire inadvisability of investing money in any of the proposed dock projects, and so incontrovertible do the calculations of revenue into which I have already entered appear to me, that I should consider it a mere waste of time to prolong the discussion of this point.

"The intrinsic merits of the Viger-Square scheme had strongly prepossessed me in its favour; but a close investigation of all the points involved, compels me unwillingly to class it along with the others, as being nothing more than a capacious abyss, into which much money may be recklessly thrown away."

Another scheme is one which had previously been spoken of, but not surveyed or reported on, called by Mr. Trautwine, in his Report, the "Central Project," of which he remarks that—

"The most serious objection to this scheme, is the inconvenience which would result from the interruption of the Lachine Canal, for perhaps two years, by the proposed deepening, and by the construction of the locks, and of new face-wharves in Basins No. 1 and No. 2.

"Perhaps of no less weight is the objection that the canal-basins are already crowded; and the necessity for passing large sea-going vessels through them after the completion of the docks, would greatly increase the inconvenience now experienced."

I entirely concur in the objections here named, and think that apart from many other less serious objections, it would be impossible to shut up the Lachine Canal for two years—during the period of construction.

There then remain two projects, that of the docks at Point St. Charles, and the other with an entrance from the Harbour near the Lachine Canal Locks. The latter project Mr. Trautwine thinks the best, and it was suggested by himself. Let us examine the principal features.

The space on which Mr. Trautwine locates his plan of Docks occupies about 120 acres. A large part of this land is requisite for the construction of basins for canal purposes, and was purchased by me for this object, on account of the Province, in 1852. The enlargement of the Welland Canal will double the size of the vessels now trading to Lake Erie and the Upper Lakes, so that the present water-space in the canal would be totally insufficient to accommodate two-thirds of the present number of vessels of double capacity, and therefore all the land around the canal basins belonging to Government, and *a great deal more*, will be requisite, in my opinion, for canal purposes. It is this land which Mr. Trautwine proposes to take on which to construct his dock for ocean vessels.

Here, then, there is a very serious objection to this scheme if carried out. The utility of the canal must be sacrificed for the improvement of the harbour, and sea going vessels accommodated at the expense of the river and canal craft. I have no space left to develop this idea, and to show how blind and fatal a policy it would be to cramp and fetter our interior trade, by appropriating the land required for its accommodation.

Water to supply this dock is to be taken from the Lachine Canal, on what is called the St. Gabriel level. The water in the dock would thus be five feet higher than McGill Street, or any of the streets in Griffintown; and as the dock wharves would be

five feet higher than the water, it follows, that no part of wharves could be reached from Wellington or McGill Streets except by an ascent of ten feet, and the first story of the buildings near the canal, and not included in its line, would be nearly overtopped by the canal. The docks would cross fourteen great thoroughfares between the harbour and the road to the Grand Trunk works. Instead of these fourteen streets, Mr. Trautwine proposes to accommodate the public by four draw-bridges, one on Commissioners Street, next to the harbour, one on Grey Nuns' Street, one on King Street, and one on Colborne Street, one slight objection to this portion of his plan would be that the residents on Prince, Queen, George, Nazareth, Dalhousie, McGill, King, Ann, St. Charles, St. Etienne Streets, &c., would thus be prevented direct access to the present canal, or the numerous manufactories on the river, and would have to go round to some of the drawbridges referred to. Drawbridges in such a thoroughfare could not fail to prove of great inconvenience. Of course November is not so busy a month as the summer months, but on the 11th, 12th and 13th November 1858, from daylight to dark, say in 36 hours, there passed at Commissioners Street—

Cabs and carriages	1263
Carts and trucks	4915
Double waggon	201
Double carriages and omnibuses	120
Foot-passengers	7272

Now a lockage would occupy at least half an hour. There would in that time accumulate, at Common Street, 90 vehicles of all kinds, and 101 foot passengers. At the first bridge of the Lachine Canal, at Wellington Street, and the other streets where bridges are proposed, I find the passage to and fro to be nearly the same. Vessels would require to come out of the docks stern first, the breadth not being sufficient for them to turn round—extensive mill sites, and elevators, are laid out on the plan, but for which *there is no water*, all the water is leased out already, which the present capacity of the canal affords, and there is no provision in Mr. Trautwine's estimate for enlarging the Canal. I do not

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prétend to criticise on Mr. Trautwine's views on points of engineering, but I think I shall be strictly correct in stating that there must either be an independent feeder, for the use of the proposed docks, and for affording the necessary water power to drive the mills and elevators, which on all hands are admitted to be an essential part of the scheme, or the Lachine Canal must be enlarged to afford that supply of water. To do this the water would have to be drawn off the canal in winter, during the period of enlargement, and for such withdrawal of the water, every factory on the canal, holding a Lease from the Government, would have a claim for damages during the period when their factories were closed. But again, according to Mr. Trautwine's scheme I find that a gross error has been committed in estimating the value of the land proposed to be taken for this dock project. I have asked Messrs. Spier and Son for the details of their estimate of \$485,000, cited by Trautwine as the cost of land and demolition of the buildings. Their reply was, "That the price we have allowed in our estimate for land required for the dock, ranges from 5 shillings to one and three pence per superficial foot of English measure. The number of feet required is about 743,900 feet; this is from Grey Nun to Colborne Street, including a point of Mr. Logan's. The above does not include streets." Now here is a scheme for docks, embracing a surface of about 120 acres, and on which there are numerous buildings, all at present rented, and for this land Messrs. Spier & Son have been requested to give the value to Colborne Street only—or for about 18 acres. What was the reason then, in comparing this scheme as to its cost with that of Point St. Charles the value of the whole of the land required for its construction has not been estimated? It is not sufficient to say that the greater part of the land not estimated for, belongs to the Grand Trunk Company, or to the Province. The land is worth its value whoever it belongs to, and that value is one of the elements of Mr. Trautwine's scheme of docks, in comparison with that of Point St. Charles. Although I purchased the whole of this land, and know its great value, yet I thought it best to request the well known contractors, Messrs. Brown & Watson, to estimate the value of the land and buildings which it would be necessary to purchase if Mr. Traut-

wine's scheme of docks was carried out according to his plans.
In reply I have the following :

MONTREAL, 7th Dec., 1858.

Sir,—

In accordance with the request contained in your letter of the 30th ult., we have examined the ground required for the proposed Docks, as well as the buildings thereon, and we submit the following as an estimate of the cost, viz:—

Ground from the Port to the Flour Sheds on Canal, 824,100 superficial feet,.....	\$370,845 00
Buildings on the same,.....	177,320 00
Ground South side of the Canal, nearly 91 acres,.....	309,400 00
	<hr/>
	\$857,565 00

Should the passenger and freight depots of the Grand Trunk

Company be taken as the plan indicates, we estimate

them at, 30,000 00

We consider that the value of the building lots on the Point St. Charles plan, when the plan is finished would be one thousand dollars each.

We remain,

Your obedient servant servants,

BROWN & WATSON.

To Hon. John Young,
Montreal.

P. S.—We wish it to be understood that the above estimate, for value of land and buildings is based on what we think is the present value, and not the prospective value arising out of the adoption of Mr. Trautwine's plan of docks. B. & W.

The figures will therefore stand thus, taking Mr. Trautwine's estimates as correct:—

The total cost will be,.....	\$1,073,976
Add 10 per cent,.....	107,397
	<hr/>
	\$1,181,373

Instead of \$485,000, as in estimate of Mr. Spier & Son, for ground and buildings, I take Messrs Brown & Watson's estimate,.....	887,565
	<hr/>

Two Graving Docks, included on Point St. Charles Estimate, and not included in this,	260,000
Add cost of enlarging Lachine Canal,	160,000
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We have thus a cost of,.....\$2,488,938

his plans.

Dec., 1858.

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not including damages to proprietors for streets closed up, nor damages to lease-holders of water-power on the canals for closing their mills and factories during the enlargement of the canal.

Let us now examine Mr. Trautwine's estimate for the docks at Point St. Charles. According to his figures the cost will be \$3,087,878.

Mr. T. adds 25 per cent for contingencies, of hazardous construction,\$3,087,878
I have reason to believe there is no necessity for adding more than Mr. Forsyth does, say 10 per cent, and enquiry on this subject brings me to the same conclusion,..... 308,737
\$3,396,665

Mr. T.'s dock on his own plan has a lift of 25 feet, cost for this,\$469,876
Yet he makes the cost of a lock on Point St. Charles Scheme of 20 feet lift,..... 583,441

Upon enquiry from good authority, deduct difference,..... 113,567
Mr. T. estimates for the whole of the 11 piers; 4 only necessary at present, according to Mr. Forsyth's plans, deduct estimate for 7, 158,802
Lock K, connecting Lachine Canal with dock, is a Government work, and is on the Lachine Canal lands, and will no doubt be constructed by the Canadian Government.. 133,267
Filling up lots not at all necessary at present, as parties purchasing will prefer building on the rock and getting cellar room thereby,..... 209,953
\$615,587

There is left by the arrangement of this scheme of docks 121 lots 50X90, which, in such a position, are surely worth £250, but I estimate them at only £150 each, \$121,000

Cost of the docks at Point St. Charles, according to Mr. Trautwine's estimate,.....\$2,660,078
Against \$2,448,938 for the project through Griffintown.

I have examined Mr. Forsyth's detailed estimates carefully. The prices for the various kinds of work differ from the prices named for the same work in Mr. Trautwine's estimate. On fixing his rates however, I am aware he spared no trouble to get correct

information ; and I had also the testimony of the late Captain Childe, a man of great practical experience in his profession, that after a careful examination of Mr. Forsyth's estimates, he found them amply sufficient to cover the whole expense of the Tail-Race and docks, not including the 7 piers, nor the lock to connect with the Lachine Canal, nor the earth filling at O in Mr. Trautwine's plan, and I have the most perfect confidence that Mr. Forsyth's estimate for the whole work of \$2,040,000 is correct and reliable, in which opinion Mr. Forsyth is also supported by Messrs Brown & Watson, who understand the nature of such a work as well as any contractors in the country.

As Mr. Trautwine says, "it appears to me utterly impossible to hesitate between the two plans."

By the one there is no water power, and can be none without a very considerable enlargement of the Lachine Canal. In the other, the finest water power on this continent is made available for public purposes. Messrs. Childe, McAlpine, and Kirkwood, on this subject, remark :

The value of a water-power thus located will be appreciated, when it is considered that throughout the whole grain-growing region of the West, there is almost none, certainly no amount of water-power at all adequate to the manufacture of the immense quantity of the cereals which must be exported from that region.

The value of such a power is enhanced by being located in close contiguity to the dense population along the Atlantic, where the Offal has the greatest value, and it is also increased, because it can be directly reached by Lake-craft without transshipment or drayage.

The whole available power at Blackrock, Lockport, Rochester, and Oswego has already been occupied.

These places are at a great distance from the sea-board.

At Black Rock and Oswego, the Lake Vessels can discharge grain into the flouring mills, and the manufactured flour can be loaded directly from the mills into canal boats. At the other places named, grain to be floured must be subjected to an extra transshipment, the cost of canal transport, and, in many cases, to an expensive drayage.

The plan of the contemplated Harbour of Montreal, provides for a large water-power, with the means of increasing it almost without limit, and is so located, that Lake vessels may discharge their cargoes of Grain designed for manufacture, lying alongside the flouring mills, and the grain

so manufactured can be delivered on board of the ocean ships or steamers, as well as on cars for direct transportation to the East, without drayage.

The rapid growth of the trade at Oswego will best serve to illustrate the advantages which would be enjoyed at Montreal, by the construction of the proposed works. The present condition of the trade at Oswego is not alone due to the cheapness of the greater length of untaxed Lake navigation which it enjoys, combined with the advantage of receiving and manufacturing Grain, without the expense of transshipment or cartage.

At the Port of New York there is no water-power, and Western Grain designed for export from that Port, is subjected to the expenses of transshipment at the place where it is manufactured, or to the extra cost of the transport of the raw material on the Ocean. These expenses will be obviated by the consignment of Grain to Montreal, and it will there have another advantage in the better condition in which flour will be shipped, as the barrels will not be liable to any damage or loss in the exposure of the weather. This cannot be assumed at less than twenty-five cents per barrel, or five per cent on the cost of the article.

Mr. Trautwine admits that this plan of Dock is better adapted than any of the others to an economical application of its surplus water to milling purposes, inasmuch as the tail-water would discharge *directly* into the river, thus avoiding the expense of a long tail-race.

But Mr. Trautwine differs with Messrs. Childe and McAlpine as to the advantages for milling flour at Montreal, and as to the amount of damage by the exposure of that article in its transit from the interior. I have had some experience in such matters, and fully confirm all that is said on this point by Messrs. Childe and McAlpine. It is not so much the loss of small portions of the flour by carting, or by the barrels getting soiled, as the loss by being obliged to grind wheat in the interior during winter, and by the exposure to the heat during summer. This causes flour to sour on the voyage; and the loss thereby caused to shippers here and in New York, where it is longer exposed in canal boats, is, in my opinion, nearly equal to 25 cents per barrel on the whole quantity of flour milled in the interior. With the mills as proposed at the Point St. Charles Docks, any quantity could be manufactured, and the cities of New York and Boston, and the New

England States generally, could procure fresh flour at all times, and cheaper, as I have shown, than it could be obtained at Oswego, Rochester, or other milling points in the State of New York. Mr. Trautwine again says :

"Let us assume therefore that the enlargement of the Welland Canal locks will be effected ;—and that by this means Western flour and loose grain may (as shown by Messrs. Childe, Kirkwood, and McAlpine) be brought to Montreal at 17 cents per barrel of bulk, less than it can to New York by way of Oswego. Also, that of the entire quantity of these articles, now exported to foreign countries from our North-Eastern ports, namely, about one-third of all that is sent eastward to them or to Montreal, (or say a bulk equal to four millions of barrels annually,) Montreal shall secure to herself the shipping of two-thirds, or a bulk equal to 2,666,666 barrels. This is, at least, 2,000,000 more than she now sends down the St. Lawrence. She cannot expect to receive much of the *non-exported* eight millions of barrels, because they are required chiefly for local consumption along their line of transportation ; and in districts more accessible from New York than from Montreal. And even in case the *entire* 4,000,000 of barrels exported should pass through the latter city, I think we may assign the excess over 2,666,666 barrels to the Grand Trunk ;—so that the docks could not, under any circumstances, be expected to receive a greater proportion than what I have assigned to them ;—especially if the Caughnawaga Canal project ever be carried into effect."

Messrs. Childe, Kirkwood, and McAlpine not only say that flour can be delivered in Montreal 17 cents less than it can be delivered in New York, but they also state, and Mr. Trautwine does not attempt a contradiction, that flour can be delivered in New York 8 cents less via the route of the St. Lawrence and Lake Champlain than by any other route, which is confirmatory of an opinion expressed by the Harbour Commissioners, "That the "St. Lawrence route, as a means of transport between Europe, the "Eastern States, Western Canada, and the Western States, has "not yet been fully developed ; that if the Welland Canal were "enlarged, so as to admit the passage of vessels of 800 tons, and a "canal constructed to connect the St. Lawrence with Lake Champlain, and suitable facilities created in this port, so as to shorten "the stay of the Western and the Ocean vessel, and thus reduce "the cost of insurance, storage, and price of handling property, to

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"the lowest possible rates, a vast increase of trade would thereby
"be attracted to the St. Lawrence, to the great advantage, not
"only of this port, but to the general public interests."

Mr. Trautwine thinks that docks could not under any circum-
stances be expected to receive a larger amount of bulk than
2,666,666 barrels, and more especially if the Caughnawaga project
ever be carried into effect. It will be seen from my previous
remarks, that it is through and by this Caughnawaga project alone
that I expect the trade of Montreal to increase. It is by that
project alone, that Messrs. Childe, Kirkwood, and McAlpine were
enabled to place the route of the St. Lawrence as superior to any
other in its cheapness of transit both to Montreal and New York,
even to the route through New York, when the Erie Canal is
enlarged and doubled in its capacity for trade. Without that
project, neither Messrs. Childe, Kirkwood, nor McAlpine, could
not, nor could any one else, advise the construction of the con-
templated docks, because it would be impossible to show that,
with our present means of transport, the produce of the interior
could be carried with advantage lower than Oswego. When that
project is completed, a channel is opened by which the merchant
of the Western States or Western Canada can ship direct to New
York, Boston, or the Eastern States, if he chooses, or he can store
his property at Montreal, where I hold it can be done cheaper
than is possible elsewhere, and have it at a point equally conve-
nient to be shipped to Europe, to the Lower Ports, to Portland,
to Boston, or to New York. In what a grand position would
this place the merchant at Montreal! He has a channel for
navigation open to him on the one side for vessels from sea of not
less than 20 feet at the lowest water, with an inland navigation
on the other side, extending to the head of Lake Superior, and
by and by to the head-waters of the Saskatchewan, with railways
to the West and the South in all directions, with a net-work of
railways to the East, connecting the Lower Provinces and the
Eastern Atlantic States, by a bridge across the St. Lawrence, and
also with a line in contemplation to connect the St. Lawrence
with the Pacific. By these works, he would be enabled to lay
down products at Montreal at a less cost than they can be deli-

vered at any other ocean-port in the continent, and at a point also where they are on the highway to be distributed, either for shipment to Europe, or to the Eastern States by water or by railway transport; besides being at a point to which imports from the world's markets can be brought and distributed for the supply of the vast interior, either by railroad or water, at the lowest possible cost of transport and with only one transshipment, between the ocean vessel which brings them to Montreal and the vessel which must carry them to the head of Lake Superior.

Mr. Trautwine states that under any circumstances the largest amount of property that might be attracted to the proposed docks would be equal to 2,666,666 bbls. This is an important statement, coming from such a source; but is it correct? On my authority, Mr. Trautwine states the receipts at Lake ports in the United States of loose grain and flour as equal in 1856 to 12,000,000 bbls.; and states, that about one third of this amount is exported from the Eastern Atlantic ports, say 4,000,000 bbls.; and that Montreal could not expect to get more than two thirds of this four millions, or say 2,666,666 bbls. It is true that the estimate of the receipts of grain and flour at the Lake ports in 1856 was 12,000,000 bbls, but I never stated that grain and flour were *the only articles* received at Lake ports, nor did I state that the 12,000,000 bbls. were received at tide-water in that year. I knew that a vast amount was distributed along the line of the canal before it reached tide-water. I give the following table showing the receipts at tide-water in 1856 :—

*Statement of all the Property which came to the Hudson River
on the Canals in 1856.*

ARTICLES—DESCRIPTION.	QUANTITY.	
	Erie.	Erie.
THE FOREST.		
Fur and peltry, lbs.,	90,000	45
<i>Product of wood.</i>		
Boards and scantling, feet,	206,431,200	344,052
Shingles, M.,	61,784	7,723
Timber, cubic feet,	2,967,600	59,352
Staves, lbs.,	162,856,000	81,428
Wood, cords,	874	2,448
Ashes, pot and pearl, barrels,	52,207	14,357
Total of the forest,		509,405
AGRICULTURE.		
<i>Product of animals.</i>		
Pork, barrels,	79,662	12,746
Beef, barrels,	44,143	7,063
Bacon, lbs.,	6,866,000	3,433
Cheese, lbs.,	5,676,000	2,838
Butter, lbs.,	3,278,000	1,639
Lard, tallow, and lard oil, lbs.,	6,468,000	3,234
Wool, lbs.,	2,212,000	1,106
Hides, lbs.,	588,000	294
Total product of animals,		32,353
<i>Vegetable food.</i>		
Flour, brls.,	1,098,000	118,584
Wheat, bushels,	11,741,366	352,241
Rye, bushels,	1,054,428	29,524
Corn, bushels,	9,547,143	267,320
Corn meal, barrels,	6,157	655
Barley, bushels,	1,818,082	43,634
Oats, bushels,	5,473,875	87,582
Bran and ship stuffs, lbs.,	39,620,000	19,610
Peas and beans, bushels,	361,433	10,843
Potatoes, bushels,	338,400	10,152
Dried fruit, lbs.,	738,000	369
Total vegetable food,		940,514
<i>All other agricultural products.</i>		
Cotton, lbs.,	184,000	92
Unmanufactured tobacco, lbs.,	1,156,000	578
Hemp, lbs.,	74,000	37
Clover and grass seed, lbs.,	540,000	270
Domestic salt, lbs.,	3,720,000	1,860
Foreign salt, lbs.,	210,000	105
Total manufactures,		20,207

ARTICLES—DESCRIPTION.	QUANTITY.	
	Erie.	Erie.
MERCHANDIZE.		
Sugar, lbs.,.....	12,000	6
Molasses, lbs.,.....	12,000	6
Coffee, lbs.,.....	2,000	1
Nails, spikes and horse shoes, lbs.,.....	512,000	256
Iron and steel, lbs.,.....	858,000	429
Flint enamel, crockery and glassware, lbs.,..	346,000	173
All other merchandise, lbs.,.....	11,820,000	5,910
Railroad iron, lbs.,	1,176,000	588
Total merchandise,		7,369
<i>Other articles.</i>		
Live cattle, hogs and sheep, lbs.,.....	316,000	158
Stone, lime and clay, lbs.,.....	55,314,000	27,657
Gypsum, lbs.,.....	1,322,000	661
Mineral coal, lbs.,	41,646,000	20,823
Copper ore, lbs.,.....	9,816,000	4,908
Sundries, lbs.,.....	43,262,000	21,631
Total other articles,		75,838
Total,		1,587,130

If the manufactures and products of the State of New York, amounting to 374,850 tons is deducted from 1,587,130 tons, we have a receipt at tide water from Western Canada and the Western States, of 1,212,550 tons. Besides this, there arrived at tide water from Lake Champlain, by way of Ogdensburgh, &c., 536,339 tons. If from this amount we deduct 349,366 tons, the products of the forest, (much of which is from Lower Canada,) we have 186,973 tons, which added to the above 1,212,555 tons makes 1,399,523, or an equivalent to say 14,000,000 barrels, and it is for the share or proportion of this amount arriving at tide water in the United States, that I hold Montreal can be made a competitor and not for the share of 4,000,000 barrels, supposed by Mr. Trautwine to be the amount exported. This is a mistake, however, for the exports from New York alone of Breadstuffs and Provisions in 1857, exceeded 5,000,000 barrels. I claim that the receipts now arriving at the tide water on the Hudson, could pass down the St. Lawrence, to the same point at tide water, quicker

CAPACITY.

	Erie.
00	6
00	6
00	1
00	256
00	429
00	173
00	5,910
00	588
	7,369
00	158
00	27,657
00	661
00	20,823
00	4,908
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	75,838
	1,587,130

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and cheaper than they are now taken there, or even when the Erie Canal is enlarged, can be taken there, I claim also that whether for export abroad, or for distribution throughout the Eastern States, Montreal is a better point than Albany, and that the amount likely to be received at Montreal when the Docks would be completed, is not two-thirds of 4,000,000, but *at least* one-third of the total receipts at Lake Ports, or say five million of barrels.

To compare with these large receipts at tide water in the State of New York, we have only the following paltry receipts to the 4th instant at this port:—

RECEIPTS OF PRODUCE FOR 1858.

Ashes	28430 barrels.
Flour	669,964 "
Wheat	1,774,464 bushels.
Indian Corn	105,087 "
Pork	11,640 barrels.
Butter	17,568 kegs.
Barley	23,881 bushels.
Peas	177,908 "
Lard	2,416 kegs.
Beef	729 barrels.
Oatmeal	1,854 "
Oats	113,566 bushels.
Copper Ore	0 tons.

or 140,021 tons, equivalent to a bulk of 1,400,021 barrels, or about one-tenth of the same produce received at tide water in the State of New York. The charges now incurred on flour, wheat, &c., by cartage to store, cartage from store to ship, extra cooperage, extra insurance, extra labour and extra storage, cannot be calculated less, exclusive of all wharfages, than six cents per barrel over and above what the charges might be if facilities were created in Docks, by machinery and otherwise, for receiving and delivering property. On our present trade, which is equal to 1,400,021 barrels, this extra charge would at 6 cents amount to \$84,001. If, therefore, I am correct in assuming the rate to be 6 cents, (the rate named by Mr. Trautwine), it follows that Montreal, as a receiving and shipping port, is 6 cents per barrel inferior to Oswego or Buffalo, than it can be made, and that par-

ties sending property to Montreal for sale are subjected to a charge of six cents per barrel, from the want of those facilities which exist elsewhere. This charge of 6 cents, let it be remembered, has nothing to do with the charge of 1d for wharfage on exports of flour, but is a charge, as I have stated, owing to the want of those facilities which exists in every United States Lake Port for receiving and shipping the produce of the interior.

Let us enquire with Mr. Trautwine—will docks pay, and how could they be constructed without increasing the duty of the port?

The gross revenue of the Harbour of Montreal, in ordinary years, is about £24,000—this year it is not more than £20,000, but I shall suppose £24,000 to be the probable receipts under present arrangements. This amount is distributed as follows :—

Lake Debt Interest,	£11,000
Harbour do.,	7,000
Management and ordinary expenses,	1,750
Keeping wharves in repair,	1,000
Dredging in the Harbour,	1,000
Carried to "Rest" Account,	2,250

£24,000

Supposing, however, that we obtained the 2,666,666 barrels, which Mr. Trautwine doubts our being able to get over and above our present receipts, the result would stand thus :

2,666,666 barrels, at 3 cents	\$79,998
1,400,021 " at 3 "	39,873
Surplus from Harbour revenue	53,000

172,871

Interest on cost of docks, according to Mr. Forsyth's estimate \$2,040,000	122,400
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Surplus	\$50,471
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The assumption therefore by Government of the Lake St. Peter debt and the payment of the interest, would set at liberty a sum of £12,617, which could be applied to the construction of docks. If docks were constructed, so that wheat, corn, &c. could be elevated from the vessel at a cost of half a cent per bushel, instead of 3 cents as at present, and if flour could be

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taken up by machinery, held at a low insurance, and delivered into vessel without cartage, &c. at a cost of 3 instead of 6 cents, it is evident that the docks would be used for the great bulk of the receipts, as shipments could also be made with equal facility by railway.

Now, irrespective of any increase *over the trade of this year*, which is much less than usual, let us see how docks could be constructed, based on this year's trade alone :

1,400,021 bbls, at 3 cents dock dues, would be.....	\$39,873
Surplus from harbour revenue.....	53,000
	<hr/>
	\$92,873
Interest on docks on Mr. Forsyth's estimate of	
\$2,040,000, at 6 per cent	122,400
	<hr/>
Shewing a deficiency of	\$29,527

This deficiency is made without taking into consideration the loss of some \$84,000, for want of proper facilities, and without claiming any increase to our trade, which, from the reasons already given, and from the fact of its steady increase since 1850, when the total receipts were only equal to 743,000 bbls, affords good grounds for supposing that the same progress will continue, and more especially if increased facilities are created and the charges in the port lessened. I find also that in 1858 the tonnage inwards is 70,183, against 42,157 in 1848, and 36,631 in 1843.

Now the Grand Trunk Company are perhaps more interested in a scheme for docks than any other interest in Canada. The rates which they can charge for freight are influenced by the facilities afforded the ship at the point of shipment and by the cheapness with which cars can be loaded and unloaded. It is impossible to imagine anything more complete than the arrangements which could be obtained in the dock scheme at Point St. Charles, with water-power to use all kinds of machinery. It has therefore always been a part of my plan for building docks, that the Grand Trunk Company should assist in doing so. If that Company should see it their interest to aid in the construction of docks, and would contribute as a loan say £200,000, to be paid back by the Harbour Commissioners, with interest, so soon as

the business of the port warranted their doing so, a part of the dock could be fitted up for the business of the Grand Trunk Company, and an arrangement could be made binding on the Commissioners of the Harbour not to charge harbour dues on the business of the Grand Trunk Company so long as their advance and interest remained unpaid. If this were done, even supposing the docks to cost \$2,400,000, there would remain to be provided for by the Harbour Commissioners only £300,000, for which they would *have in hand annually* from harbour receipts (supposing Government to remit the Lake St. Peter debt) ample funds to defray interest, without calculating upon attracting *any part of that vast trade, of which I think we could obtain the largest part if the improvements advised by me were carried into effect.* The figures would then stand thus :

Cost of Docks, at Point St. Charles, say.....	\$2,400,000
Proposed contribution from the Grand Trunk Company....	800,000
	<hr/>
	\$1,600,000
Interest at 6 per cent.,.....	\$96,000
Probable amount of revenue from Harbour surplus..	\$53,000
Dock and Harbour dues on 1,329,110 bbls, at 3 cts. . .	39,873
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	\$92,873

In this calculation I do not include any increase beyond present receipts.

I cannot therefore see any difficulty in carrying out this important work, which would effect a saving of at least 3 cents per bbl. on our whole trade, without that loss and damage to packages which are the result of the handling and carting necessary under present arrangements.

I have placed the financial view of this matter in its most unfavorable light. I would not be and have never been an advocate for increasing harbour dues, unless to obtain an object which would far outweigh the cost. In the construction of new docks it is not necessary to increase harbour dues to any extent, while the saving which would be effected would be very great. I think it of the greatest importance that every means should be taken to make the charges on shipping coming to the port as light as

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possible; and it is only by providing conveniencies for receiving goods, that we can expect to do so. At present the receipts for harbour dues are principally from imports and vessels; the produce received from the interior pays almost nothing. For instance, in this year the whole receipts for wharfage on produce shipped for sea at the Port of Montreal were:—

Flour	£804
Wheat	419
Ashes	410
Corn	9
Pork	1
Butter	20
Pease	247
Lard	1
Beef	6
Oatmeal	5
Oats	20
£1942	

If we adopt Mr. Trautwine's policy and wait till trade increases without attempting to make our position more attractive for trade than it is, I fear we shall have to wait a long time; and we may give an impulse to other places, by our apathy, which it may take years to recover from.

I have not made allusion to the increase which may be expected in the trade between the Atlantic and the West; but, considering the small area yet settled of the great territory to the West, no doubt its trade must increase rapidly and assume more importance year by year. Its extent in future it is impossible to predict, and the only safe calculations respecting it must be reduced from its past progress. Let me take an example of the increase in receipts of the articles, Wheat and Flour, shipped from Buffalo and Oswego in 1837, 1847 and 1855:—

	BUFFALO.		OSWEGO.		TOTAL.
	Flour. Barrels.	Wheat. Bushels.	Flour. Barrels.	Wheat. Bushels.	Reduced to Bushels.
1837.....	126,855	450,350	66,002	59,710	1,474,356
1847.....	1,903,357	5,816,362	610,494	713,531	19,099,118
1855.....	235,578	6,455,641	398,657	2,698,377	12,330,143

Montreal, in my opinion, possesses great natural advantages as a place of exchange and distribution between the ocean and interior vessel, and can be made the most convenient point on this continent for storing and holding property of all kinds for shipment in any direction, whether by rail or water, so that instead of 2,666,666 barrels, being attracted to Montreal out of the 14,000,000 barrels which arrive at tide-water, we have the power, in my opinion, of commanding the greater part of it. Of course this is a subject upon which there will be various opinions. I am supported in mine by men the most capable of judging in the Western States, and also by engineers of the highest eminence. If I am correct, look at the vast interests dependant on the paltry outlay to secure so great a result. We have the Grand Trunk and other railways costing £10,000,000, in which the people of Canada are interested to the extent of £4,500,000. On a large part of this grand undertaking there is comparatively no commerce, and what is now being done is done at a loss, to the ruin of other legitimate and necessary branches of transit. If Montreal possesses these vast advantages which I claim for it, as a depôt for imports and exports, whether to the East or to the Ocean, passengers by rail would follow the great stream of trade, as they now do, by railways running parallel to those water-lines which now transport the great bulk of imports and exports between the Atlantic and the interior. The rail would also perform its legitimate work, not in carrying heavy and bulky freight, where cheapness of transport is important, but in carrying articles of great value, and of perishable character, where cheapness of conveyance is not an object. I do not mean to say that railways will not carry heavy freight, for I know that the lateness of the season, the demand for or value of the article in market, or the necessity of the owner, frequently changes the movement from a slower to a more speedy conveyance. Then again, there is that vast trade in animals, for consumption and slaughtering, at the East, amounting last season to upwards of 670,000 in hogs, cattle and sheep, of which our railways will command a share as there is not a better point for this business than Montreal. These considerations lead me to look with per-

fect confidence to the future success of our Canadian railways, and to the belief that a double track of rails would be necessary to do the business which would flow on to them, if the policy I suggest was carried out, in the development of the route of the St. Lawrence and the great natural position of Montreal.

It is time to draw this letter to a close; and in doing so I cannot but express regret, at being forced to differ so widely from the views of Mr. Trautwine, in respect to Docks, and as to the capabilities of Montreal, as a point for concentrating a large portion of the Western Trade. I have no doubt, that in expressing his views, as he has done, he acted from a high sense of duty, but with the documents placed before him, I think he should have hesitated before dissenting so widely from all the eminent engineers, whose opinions have been given on the points in dispute, after long and intimate acquaintance with the trade of the West. More especially should Mr. Trautwine have so hesitated inasmuch as his line of professional duty had not previously directed his attention to that trade, or of the merits of the various routes in competition for the vast and increasing products of that region of country. Mr. Trautwine has not, as I understand, ever visited Buffalo, Chicago or the Western States, and it was most difficult after a visit of only a few weeks at Montreal, to understand, as well as most dangerous to speak authoritatively on matters which formed the especial study for years of engineers of equal eminence, whose views directly conflicting with those set forth by Mr. Trautwine, were endorsed by the members of the Board of Trade, after much consideration and long active mercantile experience. I cannot however, regret the discussion which has already arisen, and will yet arise on the merits of the projects of our Harbour improvements, and I trust that some of the "gentlemen of large commercial experience, and habits of close observation," who agree with Mr. Trautwine's views will be induced to support these views before the public, and point out the errors in the opinions expressed in relation to Docks at Point St. Charles, and as to the trade of this port, and in the many facts and arguments by which these opinions have been supported.

My own views on these points have long been before the public; they are the result of much reflection and considerable experience. It is well known that on various occasions, as well in Parliament as out of it, I have expressed my views on the unsatisfactory state of our trade with the west, and of the means by which that trade might be increased. Questions of greater importance, not merely to our local trade, but to the trade of the Province, cannot be agitated. Let it be remembered that the loss to the Province in 1857 from the Welland and St. Lawrence Canals was £217,000, and it will be seen *that the interest on these unproductive works actually paid for the last three years, and which must be paid for the next three years, would be more than sufficient to enlarge the Welland Canal, to build the Caughnawaga Canal, and to improve the Rapids of the St. Lawrence.*

Entertaining these views, it is not to be wondered at if I have persisted in keeping them before the public, although they should be stamped as visionary, and as "vague dreams of the imagination." It should also be remembered that other projects advocated by me, which at first were considered as unfavourably as the Dock at Point St. Charles, have been carried out. I allude to the deepening of Lake St. Peter in the old channel, which was recommended by me in a report to the Board of Trade in 1846, and was at first covered with ridicule, but which was finally adopted, and the Government works abandoned after an expenditure of about £75,000. In the same year, I suggested to the Directors of the St. Lawrence and Atlantic Railroad Company the necessity of bridging the St. Lawrence, and recommended as the best site a point a little below the Nun's Island. I certainly never dreamed of so noble a work as that now being erected. My idea went no further than a bridge of wood and stone. The conception of the bridge in its present form is due to Alexander M. Ross, Esquire, who examined the locality and first mentioned the present mode of construction to me when on a boat on the spot I was trying to point out its advantages. I brought the project before the public at various times from 1846 to 1852, when, at my suggestion, its construction was made the means of a compromise between the Montreal and Kingston Railway and the Grand Trunk Company.

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As Chief Commissioner of Public Works I was the first to suggest the establishment of a line of steamers from the St. Lawrence by means of a subsidy to be paid by Canada alone, and the views then held will be seen from the following extract from the Public Works' Report of 1851 :—

"From extensive inquiry, we believe that a safe route exists for steamers and sailing vessels through the Straits of Belle Isle. The distance from Liverpool to Quebec, coming through these Straits, is 400 miles less than from Liverpool to New York, which, in conjunction with smooth water from the Straits to Quebec, will enable a saving to be made of fully two and a half days in the voyage, and as the English mails usually arrive in Quebec some 36 to 48 hours after their arrival in Boston, there is no good reason why the proposed line of steamers should not be able to deliver their mails in Quebec and Montreal, in less time than they are now delivered coming through American Territory, and with vessels of the same speed as those now plying to Boston and New York, why the mails from England, with railroads from Quebec to Detroit, should not only be delivered throughout Canada, in less time than at present, but that this would also be the best route for mails destined for the Eastern and Western States. To make the route, however through the Straits of Belle Isle effective, more light-houses are required. At present there is only one light from Quebec along the whole North Shore to the entrance of the Straits of Belle Isle, a distance of some 800 miles. It is therefore recommended that a light be placed on Belle Isle, one at Cape Normand, one at Forteau Bay, one on the West point of Anticosti, one on the north shore of Anticosti, and another on the Main North Shore nearly opposite.

"Authority for the erection of some of these lights would have to be obtained from the Government of Newfoundland. These, with the other lights, for which appropriations have already been made, will do much to improve the navigation of the Lower St. Lawrence, and lessen the cost of insurance on both ships and cargoes, in all of which improvements none are so much interested as the Agriculturalists of Canada."

It is unnecessary to say how fully the fine line of steamers, now in successful operation, has verified the views then entertained, and how they have advanced not merely the trade, but the honor and reputation of the Province. I was one of the promoters of the exhibition of Canadian Industry in the London Exhibition of 1851, and moved the first resolution to that effect, and suggested and actively aided Canada taking a part in the

Paris Exhibition,—the good results of which projects need not be insisted upon.

If I allude to these matters here, it is not from mere feeling of vanity, but rather from a pardonable, and, I think, laudable pride in being associated with such undertakings, and with a view also of suggesting to those who are disposed to blame what they call my pertinacity in advocating the great projects referred to in the this letter, that these projects deserve careful consideration, and are based upon facts and arguments which, I believe, will recommend themselves sooner or later to the judgment of all who will take the trouble to examine them with attention, and which have already received the support of many of the most intelligent merchants in this city. It may turn out years hence, that the justice and prudence of the course which I have urged, and shall continue to press upon the Government and the public, in respect of the necessity of at once enlarging our Harbour accommodation and the Welland Canal, and of constructing the Caughnawaga Canal, will be as plain and palpable, as in the cases above referred to. If the views entertained by me as to the position and capabilities of Montreal referred to are incorrect and those mentioned by Mr. Trautwine and Mr. Blackwell are well-founded, I freely admit that it would be the extreme of folly to engage in any expensive Dock Improvements, and it is equally clear that the expenditure in Lake St. Peter has been made to very little purpose, and that the merchants in Montreal must be content to receive the merest fraction of the great trade of the West, and to see the stream of commerce constantly diverted from the natural Water Channel connecting the Lake with the ocean.

Before acquiescing in such a result, it appears to me that far more convincing arguments, and better considered figures and facts are required than those I have been commenting upon, and that the citizens of Montreal should examine with the greatest possible attention, the views advanced on the great projects now under consideration, and decide upon their real merits.

JOHN YOUNG.

MONTREAL, 10th Dec., 1858.

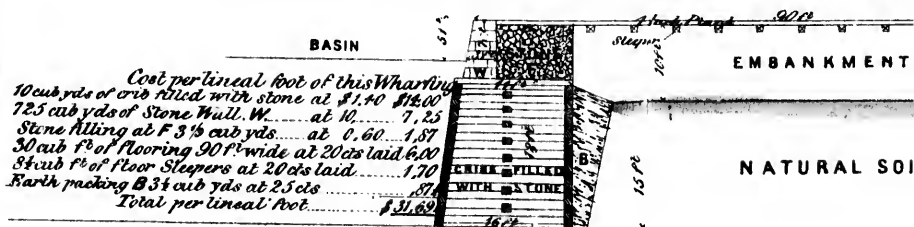
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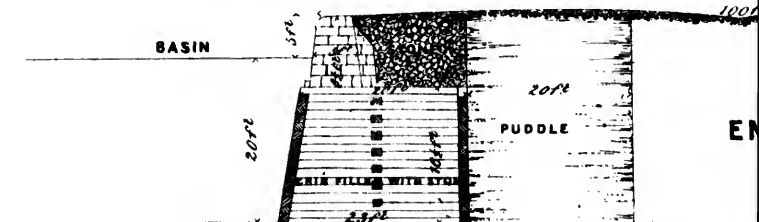
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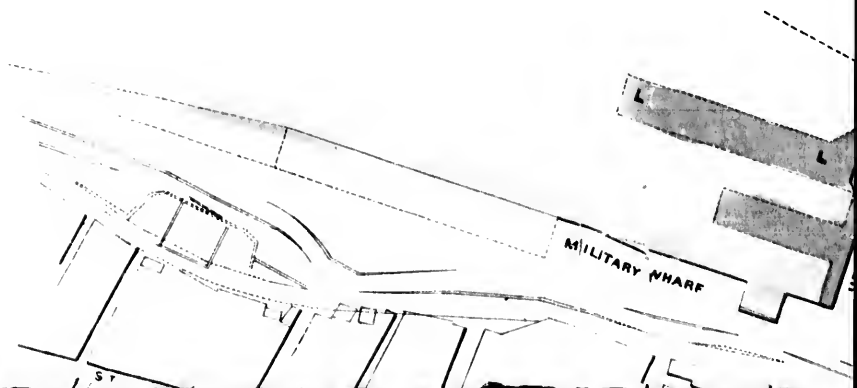
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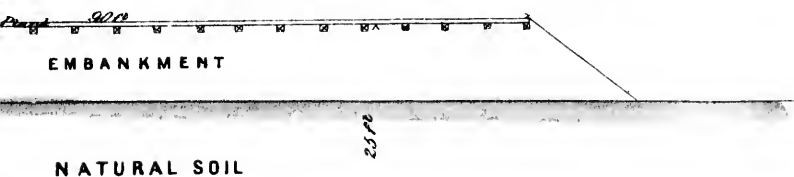


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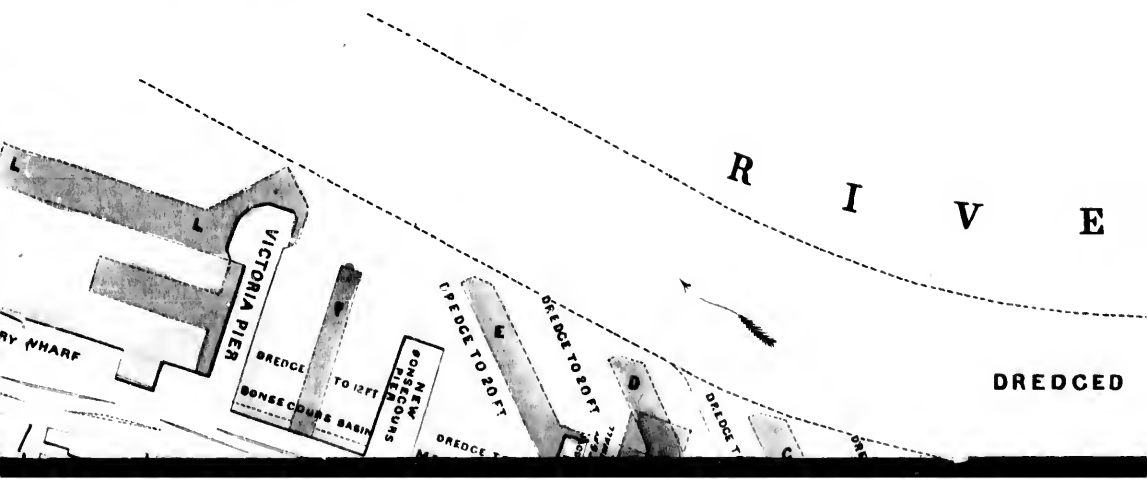
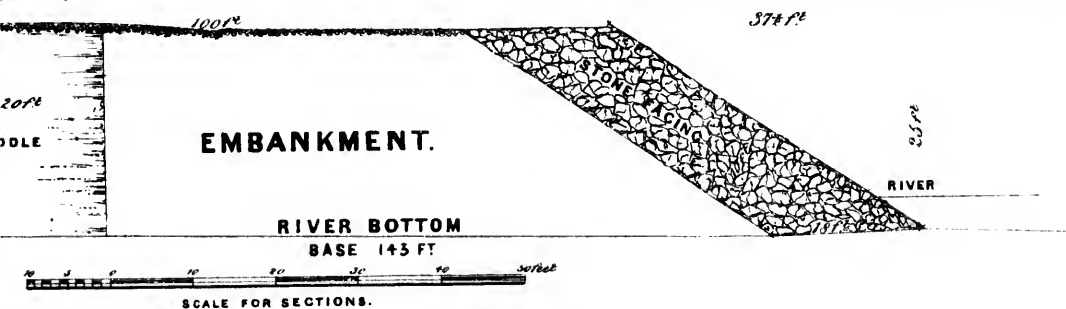
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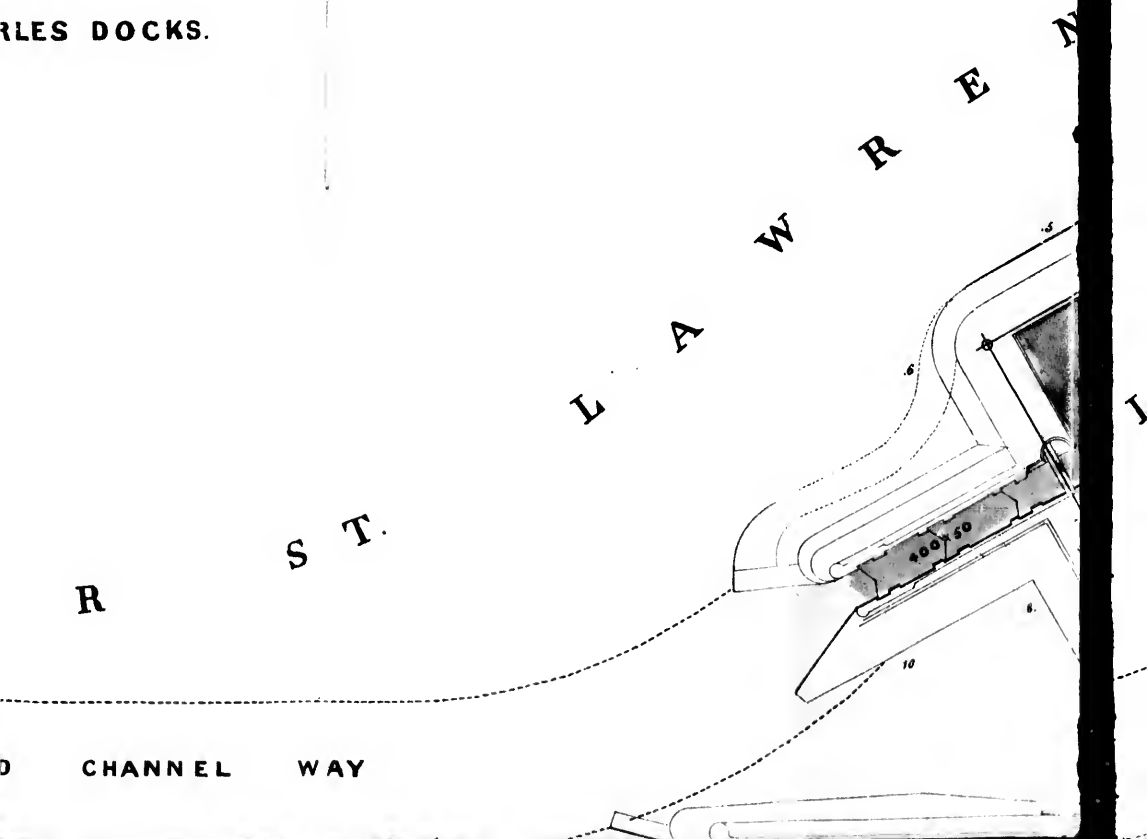
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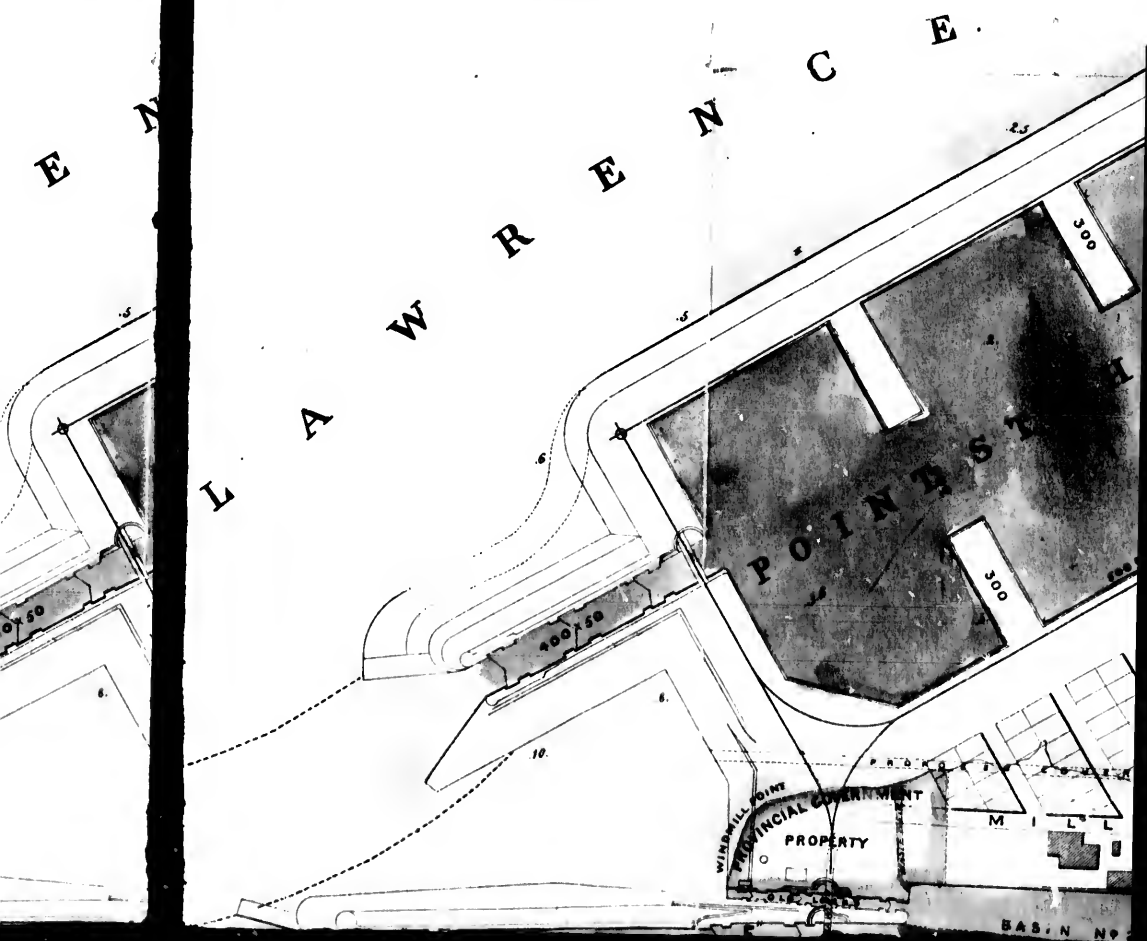
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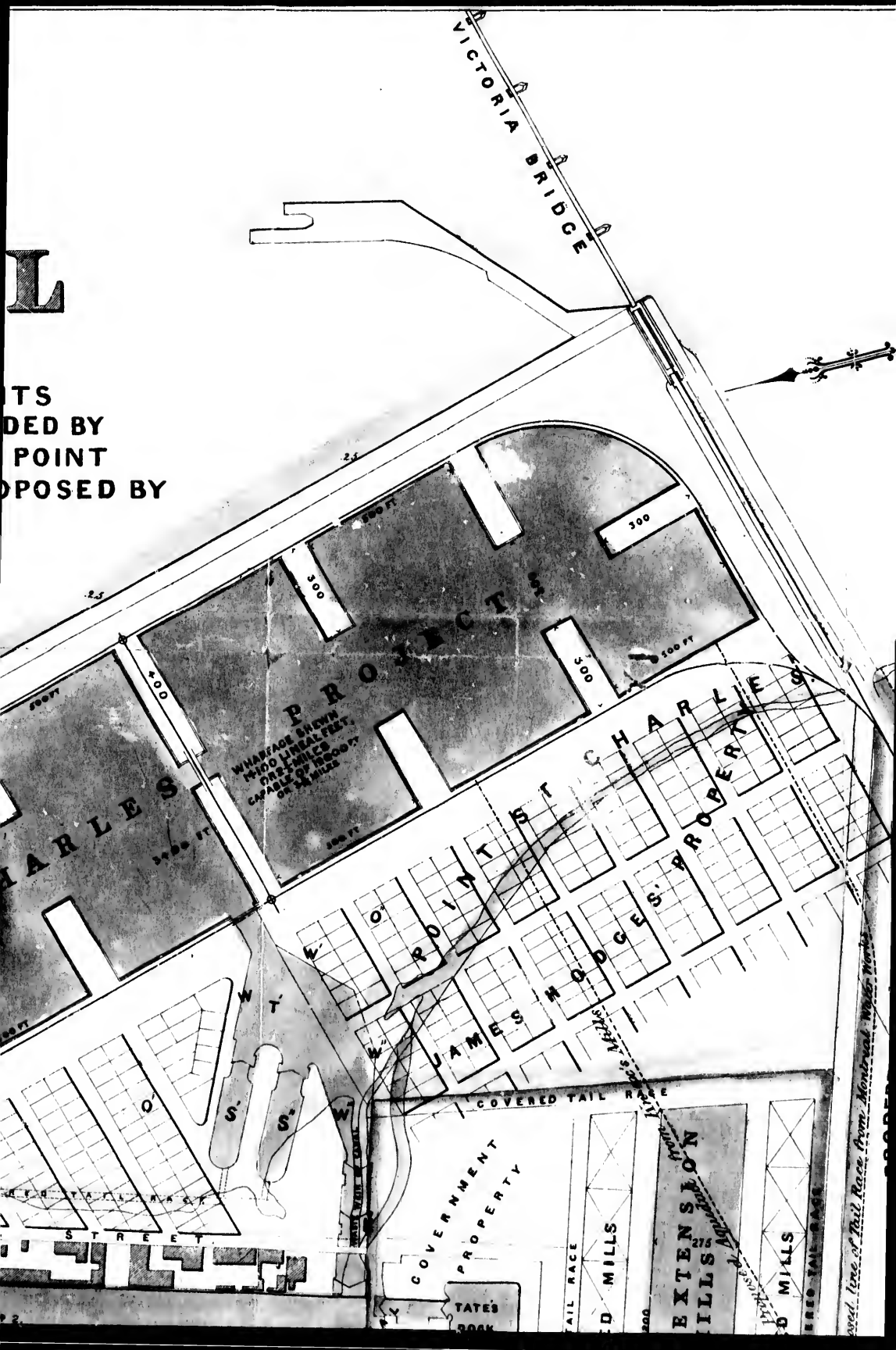
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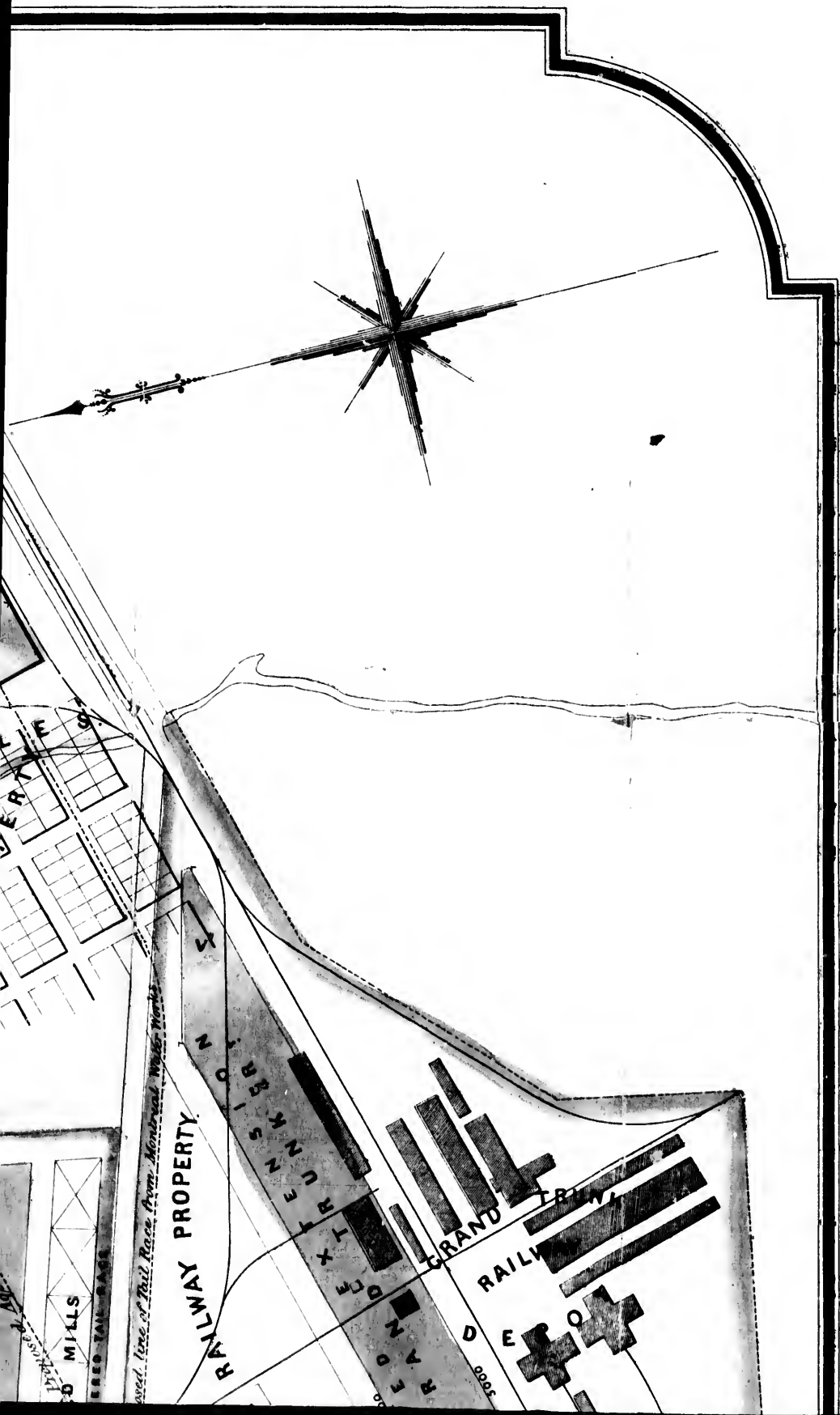
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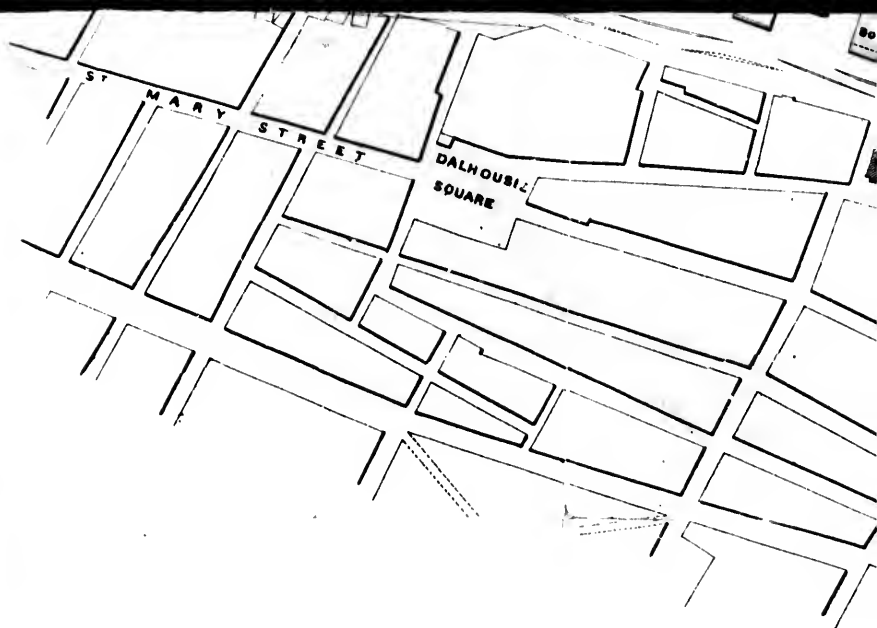
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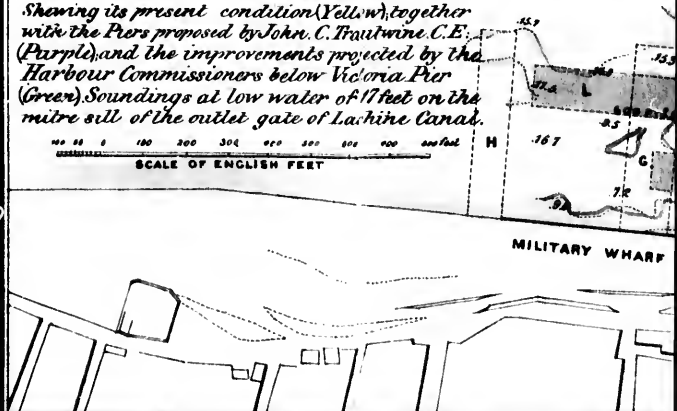


PLAN OF MONTREAL HARBOUR

Showing its present condition (Yellow), together with the Piers proposed by John. C. Trautwine C.E. (Purple) and the improvements projected by the Harbour Commissioners below Victoria Pier (Green). Soundings at low water of 17 feet on the mitre sill of the outlet gate of Lachine Canal.



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W.A. Little. Lith. Montreal.

This map illustrates the dredged port area of New Orleans, Louisiana. The Mississippi River is shown at the top, with several basins and streets labeled. The basins include Bonnechamps Basin, Market Basin, Princes Basin, and King's Basin. Streets shown are Craic Street, Dame Street, and Great Street. The map also features a scale of English feet from 0 to 2000 and a north arrow.

Basins and Streets:

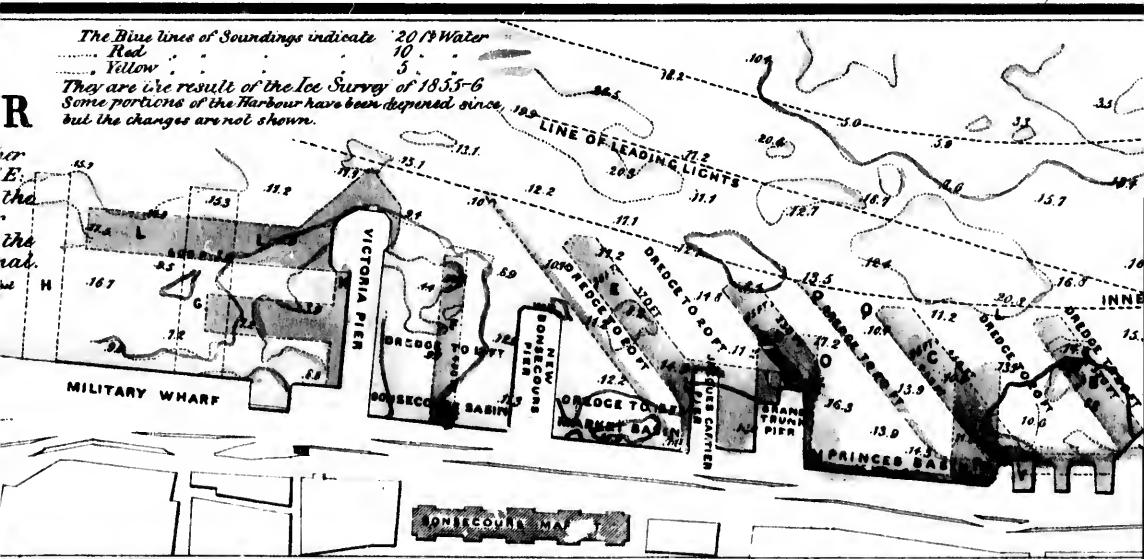
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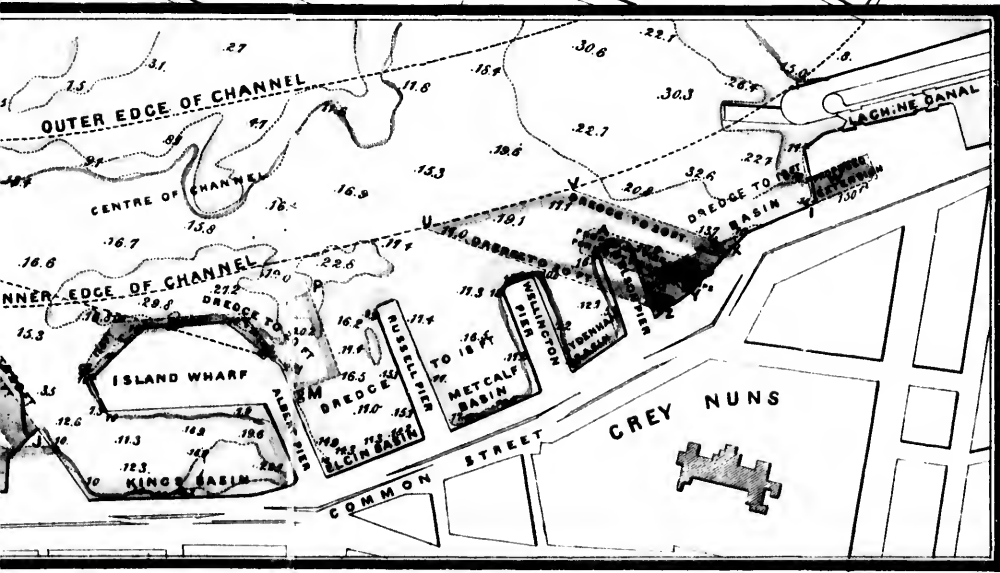
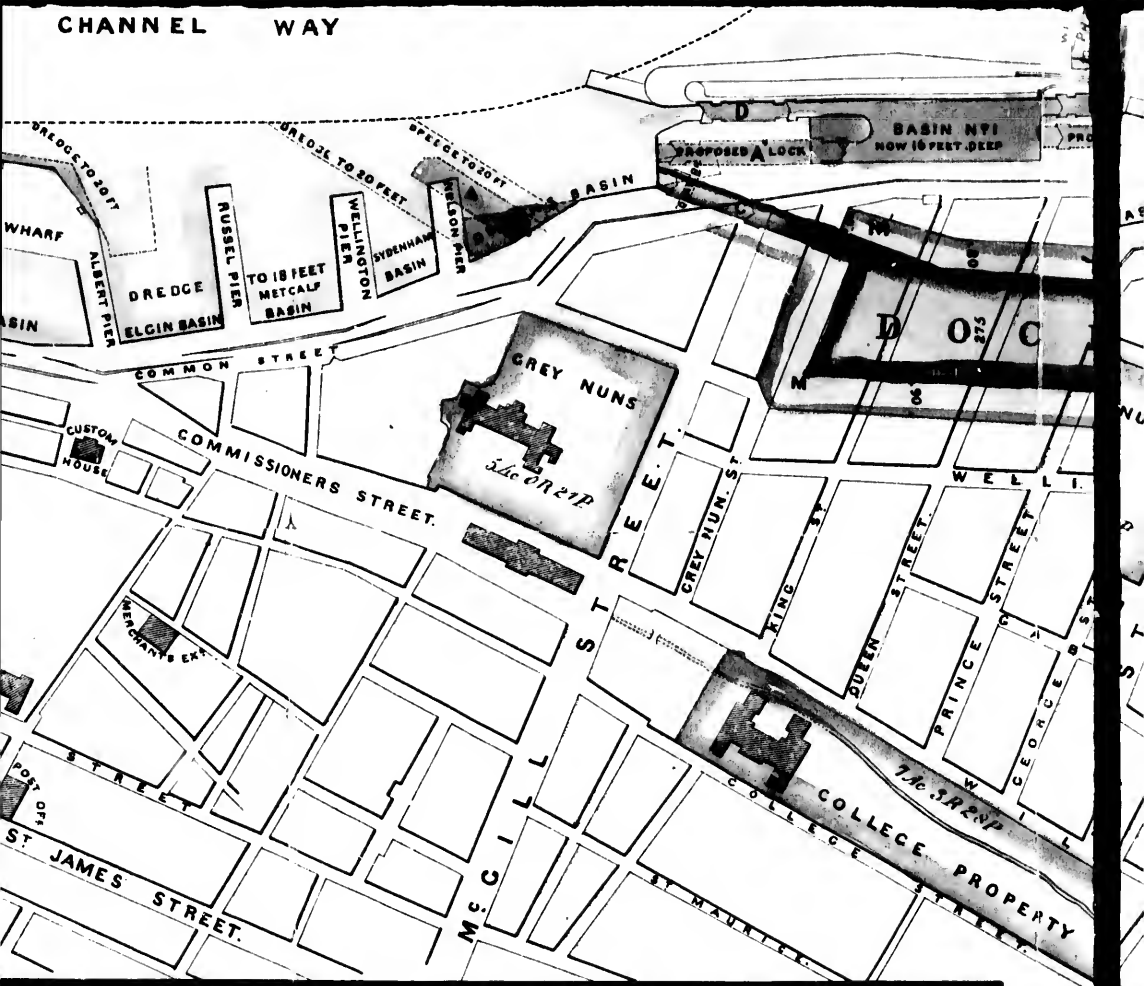
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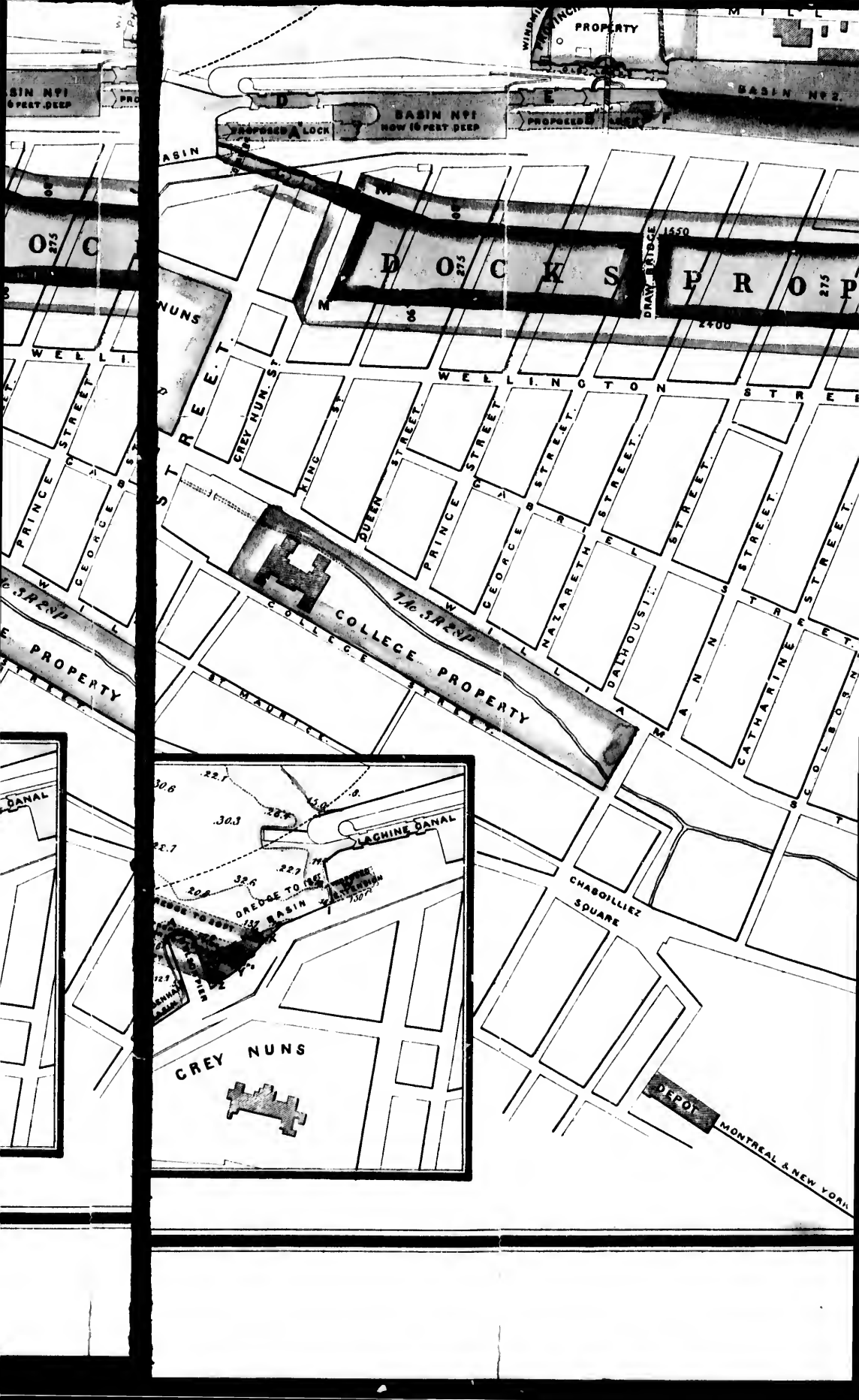
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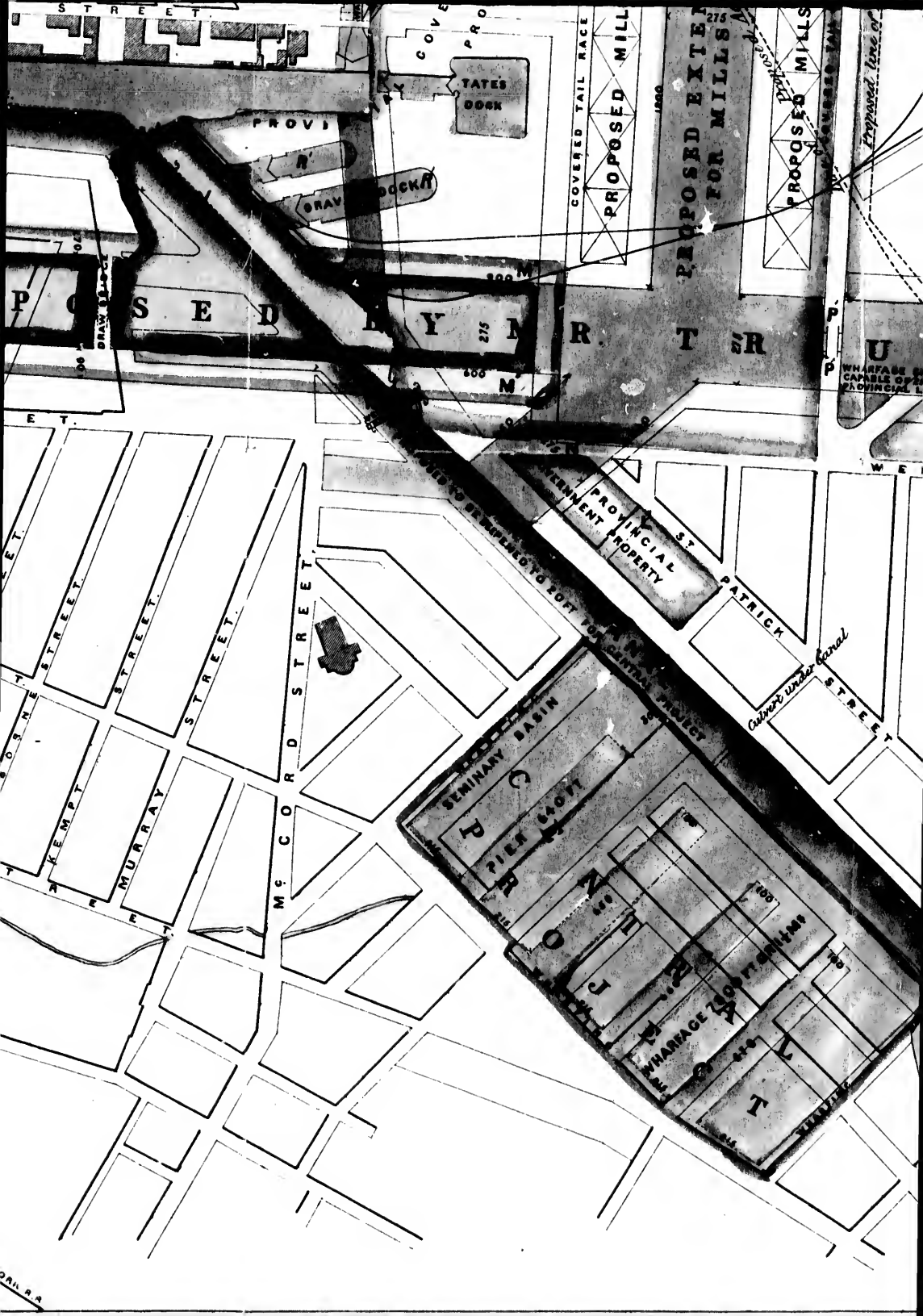
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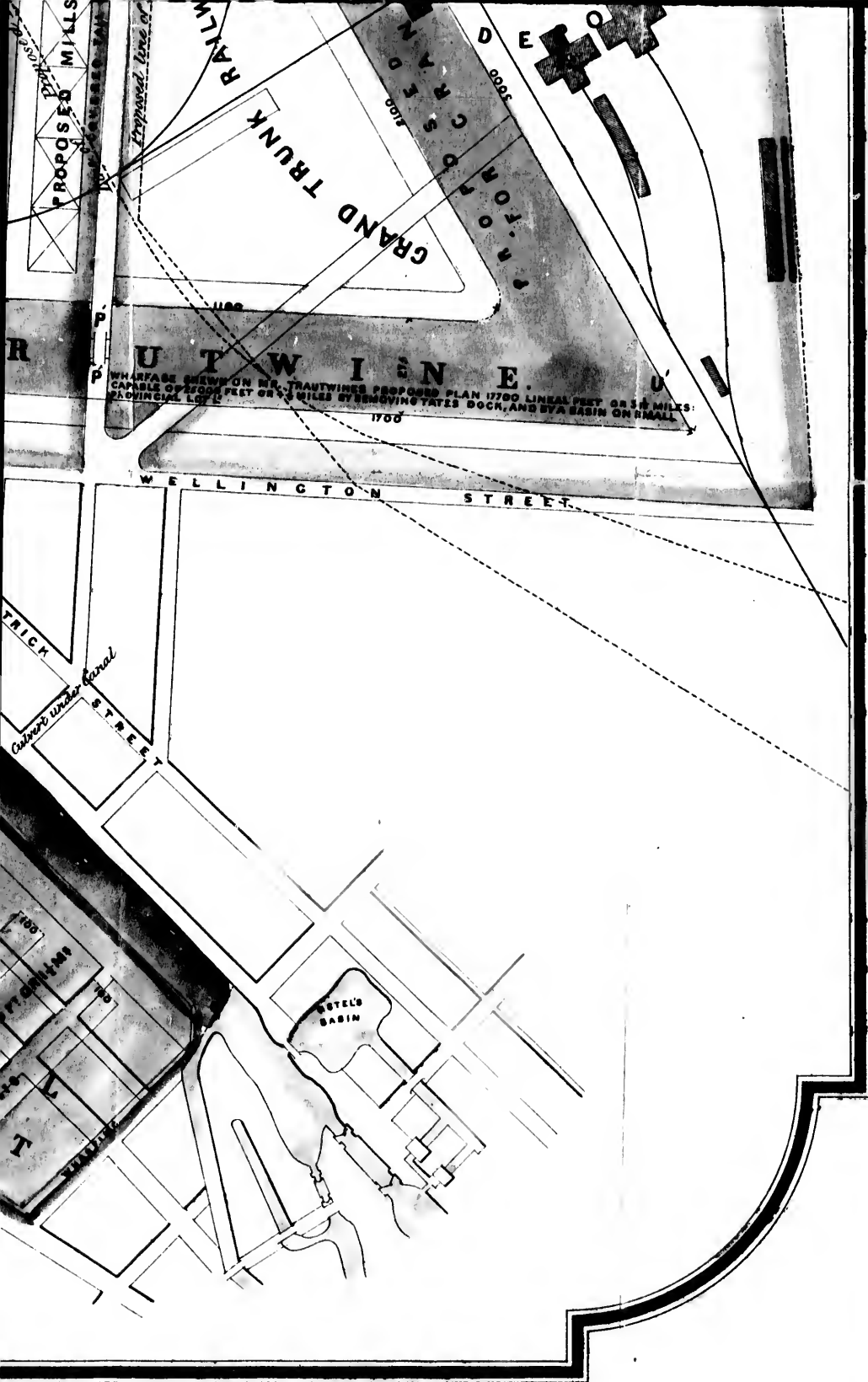


CHANNEL WAY









WHARFAGE SHOWN ON MR. TRAUTWINE'S PROPOSED PLAN 17700 LINEAL FEET OR 3 1/2 MILES:
CAPABLE OF 25000 FEET OR 1/2 MILES BY REMOVING STAGES DOCK, AND BY A BASIN ON SMALL
PROVINCIAL LOT 1

WELLINGTON STREET

HOTEL'S
BASIN