

could be formed out of which water would be pumped, and the whole of the bottom and sides lined with masonry, together with the entrance works in the usual way; this method of constructing a dock would avoid the use of a coffer-dam and if properly done would give a water tight dock, and sufficient weight to resist any pressure that could possibly be brought to bear upon its outer surface."

"A dock of this description," they go on to say, "could be formed on any doubtful foundation, even though it were covered by many feet of water at low water."

Kinipple and Morris therefore conclude that a dock may be made in the mouth of the St. Charles or, even as they have it, "on any doubtful foundation," and this without any protection wharf around it to prevent the washing away of the sand or soil from beneath the concrete and the possible settling down and breaking of a portion of the dock when left unsupported from beneath, while my plan of surrounding the dock site by a wharf renders it certain that no such wash can occur, and as I have said before render assurance doubly sure.

But this concrete caisson of theirs, if I may so call it, would cost of itself about \$264,000 while the one I propose, inclusive of the concrete within it to cause it to become heavy enough with the masonry to withstand any pressure from without, would not cost more than \$126,000. The coffer-dam at Levis, the rock excavation and the guide pier would equal in cost the last mentioned sum, if, indeed, it did not greatly exceed it; so that, in reality, by carrying out the project as proposed by me, the graving dock in the St. Charles would cost no more, if even as much

as it would if built at Levis; and if it did, the city is already pledged to pay the difference; so that if it be not built in the St. Charles, reasons other than those of a pecuniary or engineering nature must avail to deprive Quebec of what she is most undoubtedly entitled to. It is not necessary for the present to go into further detail, my only object being to convince the Council and citizens of Quebec, as I am myself convinced, that the proposed graving dock can be built in the mouth of the St. Charles, and that a much greater advantage in every respect is to be gained at Levis, at less cost, and in much less time; for the surrounding or protection wharf or wharves form part of my scheme of harbor improvements or wet docks, and are chargeable to another fund. Of this, however, more hereafter.

I have the honor to be,  
Mr. Mayor and Gentlement,  
Your obedient servant,

CHAS. BAILLAIRGE,  
Joint Engineer on Dock and  
Harbor Improvements.

P. S.—I have just received a letter from General W. H. Newton, of the United States, in answer to my enquiry in relation to the probable cost of dredging in the St. Charles, and I am happy to state that, as already inferred by me, this dredging, which has usually cost from 20 to 40 cents a yard when done with the usual dipper dredge, as on Lake St. Peter and elsewhere, is not likely to cost more than 5 cents a yard if done by the new process of pumping up the material, as now carried on by General Newton under his contract with the United States Government, and as is also now being done in the harbors of Dunkirk, in France, in California, and elsewhere.

C. B.