REPORT OF WALTER SHANLY, ESQ, C.E., ON THE CAUGHNAWAGA SHIP CANAL.

North Adams, (Mass.)
24th August, 1874.

Hon. John Young,

President Caughnawaga Ship Canal Co.

Dear Sir,—In compliance with your request, that I would examine into, and give my views of, the cost of constructing the "Caughnawaga Canal," so called, and state my opinion, generally, as to the desirability of the work and its probable effect on the trade of the country, I now beg to say :—

First—As respects cost—I have made an estimate based on the dimensions of this canal proposed by the late J. B. Mills, Civil Engineer, in 1848, and which are identical with those of the existing St. Lawrence canals—lock 200 x 45 feet, with 9 feet of water on the sills.

I, of course, accept as correct Mr. Mills' quantities of the several kinds of work embraced in the construction of the canal on the plan referred to, and do so with the utmost confidence in their reliability; a confidence inspired by my knowledge of the care and accuracy with which such calculations ever came from the hands of my deceased friend, and at one time, professional chief.

His estimate of cost amounted in the aggregate to $1,814,-408, which under the prices ruling for such kind of work five and twenty years ago would have been ample at the time, but in view of the great advance in the value of labour, materials, lands, and all things else entering into the cost of undertakings of the sort, I cannot bring the amount that would now be required to complete "Mr. Mills' Canal" in a proper and substantial manner below $3,763,000; in which, however, permanent stone structures are provided for where, in some cases, aqueducts for instance, the original estimate contemplated using wood.

Having now entered upon (at least we have been told so: the external manifestations of the fact are not wholly convincing yet) a second era of Canal enlargement in Canada, the "Caughnawaga" scheme will, of course, have to be reconsidered and remodeled in some of its originally proposed details to make it fit in with the other parts of the system — whatever that is to be. The dimensions adopted for the new, or improved, Welland canal, are—locks 270 x 45 feet, with 12 feet water on the mitre sills.

Not having access to Mr. Mills' detailed plans and notes of survey, I am without the requisite data for making more than an approximate estimate of the cost of constructing the Caughnawaga canal on the scale of the "enlarged Welland," but, approximately, I would not venture to state the additional outlay at much less than 50 per cent. advance on the cost of the lesser work. In other words, the Caughnawaga canal on the dimensions above assigned to the Welland would involve an outlay of some $5,500,000. But I do not think that such large capacity, in respect of depth at all events, is needful to ensure to a canal connecting the St. Lawrence with Lake Champlain its fullest measure of usefulness and success. The difference in cost in a canal adapted to vessels of 12 feet draught and one of two feet less depth would, in this instance, be not far short, probably, of a million and a quarter of dollars. Ten feet draft is as much as is required, and on that basis the Caughnawaga canal may be constructed for about $4,250,000.

So much for my views on the cost question; and now, with your permission I will touch upon the general proposition of the improvement and perfecting of our canal system, as bearing on the Lake Champlain connection.

It is undoubtedly desirable and important that our river improvements—St. Lawrence and Ottawa alike — should be of uniform design; parts of one system; but I hold that the Welland canal ought to be conceived and carried out on a widely different scale, as having a different mission to fulfil. The object of the Welland canal is, or should be, to do away with, so to speak, the barrier dividing Lake Ontario from the Lakes above by making the canal of such ample proportions as will pass, with the least perceptible interruption possible, the largest vessels employed in the carrying of flour and grain. Chicago harbour, formerly adapted to vessels of ten feet draft only, has been improved to 14 feet of depth, and with any less water on its locks-sills the Welland canal will not properly accomplish the object indicated above. The largest propellers loading in Chicago or other upper lake ports should at least, be allowed the option of proceeding without break of bulk to the extremest easterly point of lake navigation in Canadian waters—Kingston or Prescott. Let the bulk, or even a fair proportion of the bulk, of western freight once get down into Lake Ontario, and we of the River can battle for it with every certainty of being able to carry off the victor's share.

Transhipment from lake vessels to river and canal craft will be the rule in our St. Lawrence carrying trade. Occasionally, in the future as now, a ship will clear from lake ports for a trans-oceanic voyage, and then, as now, let us "improve" our river navigation to the utmost possible capacity that money can effect, will find herself taking low rank among and consequently unfitted to compete on equal terms with, purely sea-going vessels. Direct freighting from the Lakes to Europe will, therefore, for ever be exceptional. Transhipment will be the rule, because it will pay best all round, and the first transfer of cargo will for the most part take place at the point beyond which, because of the shallowing of the water, the largest lake vessels cannot descend. The river navigation never can be improved to the capacity of the lakes, and sailing masters will not throw away the advantage of the two, three, or four feet greater draught that lake navigation will allow of, as compared with the river, merely that they may pass "clear through" to Montreal or Quebec, or, mayhap, odd times to Liverpool.

If, then, lake-navigation is always to imply a totally different class of vessels from that best suited to the river, the next point to be considered is—what is the most fitting craft for the latter service, and what the extreme depth of water really needed for such craft, and that can be obtained within reasonable limits of expenditure.

The bulk of the grain trade from Kingston to Montreal has for the last ten years or thereabouts, been done by means of barges of the extreme size that the St. Lawrence canal-locks are capable of passing, and the capacity of the largest of which (the barges) may, I suppose, be taken at about 22,500 bushels. If then, as is, I think, easily susceptible of proof, no cheaper, safer, or speedier mode of transporting flour and grain over the river portion of the route between Chicago and the ocean (or ocean vessel) can be devised, the barge undoubtedly will continue to be employed to the exclusion of almost every other kind of craft, and the use of propellers for the carrying of those commodities through river and canal, each propeller with engine-power enough for the movement of half a dozen barges, each carrying a propeller's cargo, will, year by year, bear diminishing proportions to the barge fleet.

The St. Lawrence canals, as already noted, have locks of 200 x 45 feet, and were meant to have 9 feet of available depth, but, as a matter of fact, not above 8½ feet can be depended on; not, at all events, in such low-water periods as we have been having experience of in recent years. Had those works been designed in the first instance for ten feet draught, and the sills of the locks put down to where that depth would have always been certain, we should probably never have heard much about future enlargement — not as to depth at any rate. To improve those canals to ten feet draft now will be a work of very large expense, only to be achieved at serious temporary inconvenience to the trade of the river, and it may be worth weighing whether prudence would not counsel to abandon the attempt to deepen them, and, instead, to give the forwarders compensation in increased length of lock—a simple and inexpensive mode, as compared with the delay and cost of deepening, and where expediency has to be practiced, of gaining increased capacity. The St. Lawrence canals, as they are, even, are capable of doing a large business in our season of 200 days or thereabouts. They have never yet been taxed to anything near their full powers of accommodation. I am quite sure that seventy-five milion bushels in the season, and that means a very large business, would not over-tax them. Still, increased capacity will be demanded, and in one form or another must be conceded; but whatever the plan adopted, I hold to ten feet as the greatest depth of which river navigation, without incurring needlessly large outlay, is susceptible, and that for that depth all future improvements, on both rivers, should be planned, and to that depth limited.

(To be continued.)