

Suggestion No. 8.

A ladder-dredger, working on piled staging, outside the breakwater.

This would involve nearly all the difficulties of getting rid of the stuff, which appertain to the Priestman process, with the additional disadvantage that it would be much more exposed to risk from the sea, and, being comparatively a very costly implement, that would be a serious disadvantage. If kept on very high and strong staging, to avoid this, of course the cost of such staging would be materially increased, and the height of lift, moreover, would be abnormal. The difficulty of travelling round sharp curves, in order to follow the shingle-face, with a machine of such length as a ladder-dredge must necessarily be, would also be very great. It is not, therefore, at all probable that this form of dredge would be found satisfactory.

Suggestion No. 9.

Dredging face of shingle-bank, in the open sea, from a vessel afloat.

To do this at Timaru, with a ladder-dredge, would, of course, be impracticable, even in the calmest weather usually experienced here, but it might at times be done by a Priestman or pump-dredge. The interruptions, however, would be so frequent, that it could not be relied upon to any considerable extent, and so cannot be recommended for general adoption; but, if the form of dredger which is recommended is procured, it might sometimes be found advantageous to use it at the face of the shingle-bank, when the conditions are exceptionally favourable.

As regards Dredging Proposals generally.

Many other proposals were suggested, and fully considered, but those above described seemed to be the only ones worth specially mentioning.

C. Y. O'CONNOR, M. Inst. C.E.

MR. GOODALL'S REPORT.

Timaru, 2nd April, 1891.

SIR,—

Re TIMARU HARBOUR-WORKS.

I have the honour to acknowledge the receipt of the instructions, from the Secretary of the Timaru Harbour Board, appointing me a Commissioner, along with Mr. C. Y. O'Connor, to consider the "danger that exists to the harbour from travelling shingle;" to inquire, examine, and report on the subject, and to state whether the danger can best be averted "by erection of permanent works, or by removal of the shingle;" and beg to report as follows:—

The subject has been thoroughly, and exhaustively discussed and considered, between your engineer, Mr. Marchant, Mr. O'Connor, and myself, and the result has been retailed in the report signed by Mr. O'Connor; but, although Mr. O'Connor and I are agreed on main points, yet, necessarily, there are some points of difference between us, so I could not endorse the report. I, however, state that I agree in all that has been said in the report named, except in so far as I shall now explain.

I fully agree with Mr. O'Connor that it would be advisable to take steps to avert the danger of the shingle overlapping the works, but not from the consideration that there is imminent danger to the works for some years to come; but, as there is a probability of danger at some future time, and as it might be advantageous to restore the beach, to the north of Timaru, by allowing the shingle to travel northward from the breakwater, I consider it would be advisable to at once initiate works for removing an average yearly quantity of shingle from south of the breakwater to the north.

I cannot agree with Mr. O'Connor that there is an average of 80,000 cubic yards of accumulation per annum, and although his calculations have been based on figures taken from Sir John Coode's plan, I cannot consider that the result, as arrived at, gives an accurate amount. I consider that the records of Mr. Marchant, which made the accumulation for the last five years, 300,000 cubic yards, to be more reliable. This will give an average of 60,000 cubic yards per annum, equal to about 90,000 tons.

As for the rapidity with which the shingle may travel along the breakwater, I do not consider the circumstances cited at New Plymouth, can be taken in evidence as to what might occur at Timaru, the two cases being so widely different, and the experiments of Mr. Balfour cannot give data to be relied upon, and the rate of progress of the shingle along the breakwater yearly may soon be changed for the better, for, as the shingle creeps out, the line of beach would become more and more at right angles to the strike of the waves, and so the travel of the shingle would be slackened.

I agree with Mr. O'Connor that there are only two means of averting the danger to the harbour from the growing accumulation of shingle—(1) by extending the mole from the first cant in its original direction; or (2) by dredging the shingle-accumulation as it accrues, and I agree with him in the choice of the latter method.

ALTERNATIVE NO. 1—BY EXTENDING MOLE.

I fully indorse all the reasons set forth for not recommending the extension of the breakwater, but cannot agree with Mr. O'Connor that, "had the straight-out cant been originally prolonged in its original line, it would be a different matter, as the cost of the works as a whole would then have been much less than if such extension were made now;" for had the cant to the north not been made, and the straight-out from the shore extended instead, a successful structure at a very low price, such as the present north mole, could not possibly have been erected to enclose the harbour, as it would not have been sufficiently sheltered, as there would have been no shelter from the north-east and only partial shelter from the south-east, a very expensive wall would have been required, and therefore the extension of the straight-out cant could not have cheapened the work as a whole. Besides which, unless the cant was made to the north, adequate shelter could not have been given to the mouth of the harbour, and the ocean range would have freely swept in.