

know whether to accept or reject. Altogether, therefore, it is probable that the cost of sending some one acquainted with the locality to England and Holland would be more than saved; if not in the procuring of a higher class machine, possibly in the rejection of some altogether unnecessary redundancy.

DREDGING RECOMMENDED IN THE MEANTIME, PENDING PROCURING THE PLANT HEREIN DESCRIBED.

Whichever way the question is decided, however, it is evident, at any rate, that the procuring of the necessary machinery for the efficient performance of the work now required to be done will take a considerable time, and, as it is desirable that no time should be lost in meeting the shingle-accumulation danger, it is suggested, that in the meantime the Board's existing Priestman grab-dredger should be utilised, to such extent as this can economically be done, first, by working it on the edge of the breakwater, and afterwards, unless the shingle-accumulation keeps continuously progressing forward, on a staging of the character indicated on the section herewith, following the face of the shingle-bank to such extent as may be requisite. For some time, at any rate, it is probable that this process, though inadequate to keep pace with the annual accumulation, will not be more expensive per ton dredged than any other plan would be; in fact, while the circumstances remain suitable, it may possibly be the cheapest plan of all, so that nothing can be lost by adopting it, so far as it will act. No dredging, however, should be done where it will not be filled up again by the accruing accumulation, as this would not help to meet the difficulty in any way, and would merely be making holes in the area which might otherwise be utilised for various purposes.

SURVEYS.

To refer now, for a moment, to a subject which is of minor importance, but which we think should nevertheless receive attention, we would wish to take this opportunity of recommending, that periodical and systematic records should be kept of the progress of the shingle-bank, and of the seabottom for some considerable distance out therefrom (where sand-deposit is liable to take place) in order to be able to satisfactorily define and realise, from time to time, the changes which are gradually occurring; and thus, if possible, to trace their causes, and if possible counteract them, or some of them, when they are detrimental to the harbour. To do this satisfactorily will require the establishment of permanent marks, defining suitable base-lines for soundings, &c., which would thenceforward always be adhered to. This will, in the first instance, entail some little expense, but we feel satisfied that such expense is justifiable, and will probably lead to economy in the long run, even if only in the future cost of making the soundings and measurements, which will probably be made from time to time in some way in any case.

CONCLUSION.

In conclusion, we would wish to express our thanks to the Chairman and members of the Board, for the facilities which they have placed at our disposal, towards acquiring the information necessary for this report, and for explaining so definitely as they have done the exact questions which they wished to have answered; also to the officers of the Board for their willing and kindly assistance. This is especially so as regards your engineer, Mr. Marchant, whose careful and long-continued study of the questions referred to us, has given him most valuable and exhaustive knowledge and ideas on the subject, and these he most willingly and cordially placed at our disposal.

We have, &c.,

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

The Commissioners appointed by the Timaru Harbour Board, by letter dated 21st March, 1891, to examine into, and report upon certain questions, concerning the Timaru harbour-works.

The Chairman, Timaru Harbour Board.

LIST OF PLANS HEREWITH.

1. General plan—Showing harbour, and area of shingle-accumulation.
2. Longitudinal section—Showing progress of accumulation along line of breakwater.

APPENDIX TO REPORT BY MESSRS. O'CONNOR AND GOODALL, DATED 2ND APRIL, 1891.

LIST OF SOME OF THE SUGGESTIONS FOR DREDGING, WHICH HAVE BEEN CONSIDERED, AND THE REASONS WHY THEY HAVE BEEN REJECTED.

Suggestion No. 1.

Priestman grab-dredgers (as many as may be found necessary) to work on the breakwater, and discharge into elevated bins, also on the breakwater. The stuff to be taken from thence by steam hopper-barge.

This would probably be a cheap process, but it had to be rejected, for the reason that it would only work satisfactorily, for any considerable length of time, in the event of the shingle-accumulation reaching the breakwater in a uniformly progressive manner. This it would not be at all safe to reckon upon. It certainly has not been so in the past. There is, however, more apparent probability of its being so in the future; and it is to some extent on the assumption that it will be so, for at any rate considerable periods at a stretch, that we have recommended the employment of the Board's existing Priestman grab-dredger, pending the procuring of a pump hopper-dredger.