

1880.
NEW ZEALAND.

TIMARU HARBOUR WORKS.

(REPORT OF THE COLONIAL MARINE ENGINEER AS TO THE DAMAGE CAUSED BY BUILDING A BREAKWATER AT TIMARU, AND THE FURTHER DAMAGE THAT MAY ACCRUE THEREFROM.)

Presented to both Houses of the General Assembly by command of His Excellency.

No. 1.

The COLONIAL MARINE ENGINEER to the Hon. the MINISTER having Charge of the MARINE DEPARTMENT.

Memorandum re Timaru Harbour Works.

Public Works Office, Wellington, 2nd February, 1880.

MY last report on the Timaru Harbour works was on 3rd July, 1879, and was intended to reply to certain questions asked by the Hon. the Minister for Public Works—viz.: What amount of damage was inflicted on the railway? How much of this was due to the Harbour Board's operations? What action is necessary, and its probable cost, in order to prevent further encroachments, and to arrange that the Harbour Board, if thought responsible, should undertake repairs?

The reply to the above was given in qualified terms—namely, that there could be no doubt that the damage to the railway line north of Timaru Harbour works was due largely to the erection of the breakwater; but until further evidence was obtained, it was difficult to state how much of the damage was due to the breakwater, and how much to the violence of the storms.

Since this the action of the sea has been closely watched by Mr. J. H. Lowe, the Resident Engineer for Railways, who has twice reported on the subject. A perusal of these reports shows the prejudicial action of the breakwater in so clear and strong a light, that there need now be no uncertainty in the mind of any one who is capable of justly estimating the importance of the facts therein recorded. The facts are briefly these: Before any breakwater was erected, the sea-beach was covered with a coating of shingle of such a breadth, depth, and quantity as to act as a protection to the softer parts of which the beach on which it lay was composed. This shingle, or the upper layer of it, was in an almost constant state of motion along the beach northwards, due to the action of the sea. When the breakwater was erected, it acted as a stop to the flow of shingle, which became banked up on its southern face, while the shingle which had already passed the line of the breakwater still continued its motion, gradually as it moved, laying bare the beach beneath. As the beach was laid bare and deprived of its natural protection or clothing of shingle, its denudation and destruction by the sea became rapid, as described in Mr. Lowe's second report. This action, if the building of the breakwater is proceeded with, will go on; the shingle will be moved northward; and, no further supply following, the spits or beaches across the mouths of the lagoons will disappear, and the railway embankment across these lagoons will be laid open to the attacks of the sea. This action will not be confined to the locality of Timaru; it will be felt in due course of time (shorter or longer, according to circumstances) along the whole stretch of coast-line to Lake Ellesmere, working changes, the nature, but not the full extent, of which can readily be foreseen.

It may, then, be asked why this effect of the building of a solid breakwater at Timaru was not pointed out, and its promoters and the Government not warned that disastrous effects would follow. An answer to this question may be found by perusing a report, dated 1871, made to the Timaru and Gladstone Board of Works by Mr. Carruthers, the late Engineer-in-Chief, wherein he describes, in terms most precise and almost to the letter, what would be the result of building a solid breakwater. His words are: "The shingle being thus stopped, it would collect on the south side of the breakwater, until in the course of time it had pushed out to the end of the latter, when the northerly motion would begin again. In the meantime the shingle to the north, beyond the protecting influence of the breakwater, would have been still moving northwards. As no new shingle could come to supply the place of that which had moved on, the coast would soon be bare, and the sea would begin to cut down the sub-beach."

Again, "The first effect of the above works would be the degradation of the coast to the north."

Again, "The detached shingle beach across Washdyke Lagoon would next begin to disappear."

Again, "I strongly recommend the Board not to undertake the work, notwithstanding the great benefit which a harbour at Timaru would cause to the rich surrounding country."

Mr. Carruthers, and, later, Sir John Coode, have been emphatic in the expression of their views as to the bad effects of stopping the flow of shingle. Mr. Balfour, in making his first design for a breakwater, fully appreciated the difficulty of dealing with the moving shingle, and showed that a portion of it should be built open to allow shingle to pass. Mr. Carruthers