The estimated cost of the works described above, which had for their special object the prevention of the passage of sand from the south on to the sea-bed, at the back of the breakwater, was as follows:—

	£
Rubble-stone groin between mainland and Mikotahi ..	1,000
" " Mikotahi and the Lion Rock	56,000
" " the Lion Rock and Moturoa	10,000
Plant and contingencies	11,000
Total ..	£78,000

Present Condition of Sand-growth.—The most recent condition of the sandspit under the lee of the outer portion of the breakwater is indicated on a trace attached to Mr Blair's memorandum, dated the 29th May last. It shows the spit to have grown in length from 450ft., as named in Mr. Blackett's report of the 10th April, 1888, to 850ft., measured in a southerly direction from the end of the breakwater Again, the extreme breadth of the growth within the 10ft. contour-lines is now 600ft., whereas on the plan which accompanied Mr Blackett's report the maximum width was 120ft.

In a report by Mr Humphries, the Chief Surveyor, dated the 30th March last, on soundings taken at New Plymouth with a view to ascertain the extent of the sand-accumulation near the breakwater, attention is called to an alleged formation, which is described as "another spit" or "deposit of sand, running directly out to sea due north from the end of the breakwater for 1,400ft. At 1,000ft. out the deposit is 4ft. 6in. thick, but, being in 5 or 6 fathoms of water will not be disturbed again. Out from the end of the breakwater, and in the direction of the proposed ultimate extension, the sand-deposit is thin, and runs out at 900ft."

Mr Humphries further observes, "On the outer or seaward side of the breakwater the sand is banked up against it at the outer end as much as 15ft. above the base, and rarely in any case less than 10ft. throughout the whole length, leaving no more than 2ft. 6in. of water a few feet from it for the whole of the outer 1,200ft. Nearer in it is, of course, less. This bank slopes seaward, running out about 500ft."

Erosion of the Coast-line East of the Breakwater.—Simultaneously with the growth of the sand-deposits, to which reference has been made in the foregoing remarks, the coast-line has been wasting during the same period to the east of the breakwater, commencing about 25 chains from that work, and extending to the railway-station, a distance of about two miles. Mr Blair, in his memorandum, states that the foreshore has here been denuded of sand, sometimes to a depth of 6ft., and points out that what five years ago was a fine sandy beach is now rocks, boulders, and coarse gravel. It would also appear that the coast-line has been encroached upon for a width of from 30ft. to 50ft., more particularly in the vicinity of Moon's Reef. The boat-shed and bonded store at the old boat-landing were undermined, and have consequently been removed.

Recommendations

Construction of Groin from Mikotahi to the Lion Rock to be abandoned.—At the date of Mr Blackett's report, in April of last year, there was an undoubtedly ample justification, from the information then available, for recommending the construction of a rubble groin or mole from Mikotahi to the Lion Rock. The object of such a work, as previously explained, was to trap the sand in its passage from the south, it being believed that the pocket or receptable for sand, which would be formed to the westward of the proposed groin, would be of sufficient extent to postpone indefinitely the occurrence of further trouble from these accumulations.

The soundings and observations which have since been taken throw further light on the sand movement. They show, without doubt, that large growths have occurred immediately at the back of the breakwater, and at the same time the bulk of the spit, shoreward of its outer end, has been greatly increased. It is considered, therefore, as proved that the magnitude of the sand movements justifies the abandonment of the suggested rubble groin between Mikotahi and the Lion Rock, seeing that were that work to be constructed the interval that would be required to fill the trap so formed to the westward would be much less than formerly contemplated, and therefore at no very distant date other expedients to cope with the difficulty would have to be adopted. Moreover, the uncertainty which exists as to the alleged extensive deposits some distance seaward of the breakwater, and independent of the undoubted growth immediately at the back of that work, raise questions as to the effect of the proposed groin thereon, and the information now available is not sufficient to enable these questions to be determined with such precision and certainty as are desirable. Under all the circumstances, therefore, we do not hesitate to recommend that the proper course to adopt will be to consider that the construction of the proposed groin seaward of Mikotahi should be definitely abandoned.

Proposed Dredging.—After having sections plotted of the accumulations which have already occurred, we have arrived at the opinion, judging from the data at hand, that if means were provided for the convenient removal of, say 200,000 tons of sand per annum, the harbour-bed under the shelter of the breakwater could be maintained at its original depth. To perform this dredging, we would recommend that a pump hopper-dredger, of the character successfully and extensively used in Holland, and in some of the French ports, should be provided. Such a vessel would be about 135ft. long, 27ft. 3in. beam, and 10ft. 8in. depth of hold. She would be furnished with compound surface-condensing engines, indicating about 275-horse power The hopper would contain 380 tons of sand, which would be filled by the pumps in about one hour

The dredger would raise sand from the spit and from the seaward approach to the breakwater, and convey the same to the eastward of the work, where it would be dropped from the hopper in such a position that, by the action of the sea, it would be thrown upon the beach, and there be subject to the normal action of travel along the beach, which existed before the breakwater was erected, and which action, being restored, would render unnecessary a continuation of expenditure for the maintenance of the foreshore.