

a rocking of the structure, crushing the top of the buttress and pushing down the lower part of it. On the 12th April, 1894, a hurricane blew from the north-east, the east, and south-east. Three seas were at times breaking simultaneously on the work. Some of the monoliths were fractured and others destroyed. On the 19th June a heavy south-easterly sea increased the damage to all parts of the structure. In two places portions of the monoliths were washed away, leaving the tops of the blocks appearing just above low water, whilst the monoliths at the end, for a distance of about 96 ft., were entirely destroyed and washed away. Messrs. C. Napier Bell and J. P. Maxwell, M's.Inst.C.E., were instructed to inspect and report on the damage, and the above description of the damage is taken from their report, which is dated 4th September, 1894. It should be noted that in 1894 the breakwater had been constructed only to the shore end of the second curve. Messrs. Bell and Maxwell further reported that although they thought it necessary to strengthen the exposed part of the structure they did not look upon the damage sustained as a serious failure of the work, and added that failure of much greater magnitude has been common in such structures elsewhere. They estimated the cost of repair at £19,000, and recommended the completion of the breakwater to the Auckland Rock, an addition of 1,450 lineal feet.

In May, 1906—that is, whilst the breakwater was still in course of construction, but nearly finished to its present stage—the Board communicated with Mr. J. W. Marchant, C.E., and asked him to report upon harbour-construction for Napier, and to supply plans, estimates, and details of his proposals. He was informed that the Board desired him to consider and report on the question whether the Breakwater Harbour or the Inner Harbour was the most likely to be permanently successful in respect of structure and efficiency as the harbour for the Hawke's Bay District. Mr. Marchant reported in July, 1906. He unhesitatingly condemned the Inner Harbour scheme, and recommended the completion of the breakwater scheme, of which he approved. He considered that the successful construction of the Inner Harbour required the building of a mole or breakwater 5,150 ft. in length to protect the entrance channel, and he considered that the annual cost of dredging and maintaining the full depth of water in the lee of this mole was a matter of conjecture. He concluded: "The completion of the breakwater, its enclosure and equipment, can be confidently recommended as against any project for forming a harbour at the Spit, for reasons stated." The Board adopted Mr. Marchant's recommendation, but on appealing to the ratepayers to sanction the necessary loan the proposal was defeated.

Shortly after this Mr. George Nelson, a member of the Institute of Mechanical Engineers, published a proposal for the improvement of the Inner Harbour, and seems to have spent much time, money, and energy in the furtherance of this project.

The Board, apparently unwilling to act on the advice of Mr. Goodall backed by the advice of Mr. Marchant, decided to get further expert opinion on the matter, and Messrs. J. P. Maxwell, M.Inst.C.E., Mr. Cyrus J. R. Williams, M.Inst.C.E., M.Am.Soc.C.E., and J. Blair Mason, C.E., were asked to report. Their instructions were to trace the history of the port from its inception, and make such local investigations and inquiries as they thought fit to enable them to properly consider and report on the question of the best location and system for construction of a harbour suitable for the Port of Napier and the district served by it, to estimate the cost of carrying out the necessary work and of maintaining the harbour when constructed. They completed their investigations and made a report, which is dated July, 1909. This report appears in the Commission's Exhibit No. 1, beginning at page 103.

These eminent harbour engineers are most emphatic in their condemnation of the Inner Harbour proposal. Like Mr. Marchant, they consider that the entrance channel would need a protective mole. They conclude: "Our final recommendation is that the Board should actively push on the completion of the Breakwater Harbour in accordance with Plan No. 2 attached to this report." Again the Harbour Board approached the ratepayers with the loan proposal to carry out this scheme, and again the proposal was turned down. The floodgates of controversy seem to have been opened about this time, and Mr. George Nelson is much in evidence as an advocate of the Inner Harbour scheme and the uncompromising opposer of the Breakwater Harbour. In September, 1909, the Harbour Board instructed that a letter be sent to Messrs. Maxwell, Williams, and Mason, asking for fuller information on certain points. In their reply Messrs. Maxwell, Williams, and Mason used the strongest and most uncompromising language that professional men writing on their professional subject could possibly employ in condemnation of the projected Inner Harbour scheme. They declared that the proposed entrance channel to the Inner Harbour, being an unprotected channel in the open ocean, was a proposition of the kind that needed only to be stated to display its own refutation on the very face of the statement, and they based this statement on reasons which they gave arising out of their observations of local conditions and their experience of the principles of harbour-construction. This, however, does not seem to have guided the Harbour Board to a conclusion—a state of things that we find the utmost difficulty in understanding and endeavouring to explain. To endeavour to explain it we can only refer to Mr. George Nelson's publication "The Napier Harbour Question," appearing in the Commission's Exhibit No. 1 as pages 43 to 94. Here are to be seen criticisms, offers, challenges, and newspaper correspondence, all apparently from laymen in matters of harbour-construction, and pouring scorn on the conclusions of the experienced engineers who, with a remarkable unanimity, had endeavoured to point the Board to a conclusion. The position is perhaps further explicable by facts which we shall refer to later on; but it may be definitely stated here as a fact that collateral harbour advantages and the apparent excellencies that lie on the surface of a *prima facie* study of the question all favour the Inner Harbour proposals, whilst the defects seem to be those that require expert engineering and navigational experience to appreciate and state. Furthermore, there is a significant survey of the position in the evidence tendered before us of Mr. A. E. Jull on page 43 of the official evidence. Mr. Jull said in his evidence, "That portion of the district which is responsible for 84 per cent. of the payment of any rates has since 1911, and in