

spite of any recommendations of engineers to the contrary, been steadfast in their adherence to the Inner Harbour proposal." It may be added at this point that this statement by Mr. Jull was not a chance remark, but an apparently well-considered statement made at a time when Mr. Jull was practically reading his evidence from carefully prepared notes.

After Messrs. Maxwell, Williams, and Mason's report had been put in in 1909 a state of stalemate seems to have been reached until July, 1911. In that year Mr. William Ferguson, M.Inst.C.E., of Wellington, was asked to visit Napier and advise the Harbour Board in its difficulties. On the 9th July, 1911, Mr. Ferguson attended a meeting of the Board at Napier, was instructed as to the Board's object in sending for him, and he answered questions and advised the Board as to what, in his opinion, should be done. A shorthand note was taken of all that proceeded at the meeting, and the full type-written transcript is available, and appears as pages 119 to 137 in the Commission's Exhibit No. 1. The Chairman submitted two main questions to Mr. Ferguson at the beginning. They were—(1) Should the Board do dredging or other works necessary to secure data before seeking further professional advice to report on the respective merits of the two harbours? (2) If further dredging was recommended, should the Board buy or hire a dredge for that purpose?

Mr. Ferguson opened by expressing the opinion that the question of harbour-construction was not urgent, and that there was nothing to warrant the Board rushing into either works or schemes until it had all the data necessary to form a sound opinion. Mr. Ferguson states—

"I think you should wish to go easily, to wait until you are satisfied by expenditure in testing the various schemes as to which is suitable, and then, if you are still satisfied that it is wise to do it commercially, push on. At the present this is largely a matter of sentiment. You may get an Inner Harbour at a cost. It behoves you as business men to go easily—not niggardly, but to spend whatever is necessary to make the tests and then get a sound opinion and act upon it. What are the tests? The three engineers who reported, reported, I understand, that they did not approve of the Inner Harbour scheme because they felt certain that the dredging to form a channel in the open sea would be followed by a silting up, and I think they state that in heavy weather the channel would be liable to be obliterated and the port would be closed until it was reopened. This was simply a way of expressing their views, and I presume was not literally meant that a single storm would close the channel. As it is not a matter of grave urgency, I would spend a few thousand pounds in putting it to the test. It is not as if you had a huge city and the whole of its trade was in immediate risk because you are afraid of the silting of your harbours and you had to keep the trade open at all costs. You have carried on your trade successfully for many years, and I don't see why you cannot do so for some time to come. Hire or purchase a dredge and put it to work out in the open; dredge an area, certainly not less than 10 acres; carefully sound the area, not only 660 ft. square, but an equal distance all round it, and thus determine the nature of the bed of the ocean through dredging it; carefully sound again and find what variation, if any, exists in the surface of the ocean-bed after the dredging. Leave it for twelve months at least; sound it carefully again; if results are not conclusive perhaps it will be necessary to dredge again and sound again. Then you will have data which will show you whether the action of the sea is as stated by these three engineers (Hear, hear), whose opinion has to be listened to with every respect—whether it is as they say. If it silts up—and it is shown to be undoubted that it has entirely silted up—by the action of the sea, then you have your answer and it disposes of the question fairly well. If, on the other hand, it only silts up to a limited extent, you have data as to the expenditure you have to go to in annually dredging out that area."

As the result of that advice the Wellington harbour dredge "Whakarire" was chartered for three months, and on the 8th November, 1911, she arrived at Napier and started dredging that experimental patch of 10 acres to a depth of 34 ft. From that date to the 12th January, 1912, the "Whakarire" worked on that patch. In that time she dredged a patch 34 ft. deep and about 3 acres in extent—in all, that is—3 acres top superficial measurement, the hole being $1\frac{1}{2}$ acres at the bottom, the remaining $1\frac{1}{2}$ acres being accounted for by the slope of the sides. The dredgemaster's log in that period is almost one continuous record of difficulties and minor disasters. The experiment was then abandoned, as it was not possible to exceed the three-months charter, and in the opinion of the dredgemaster it would have taken at least nine months to dredge out the 10 acres. The dredgemaster in his evidence before this Commission stated that he had never before undertaken dredging in such an exposed part as the patch at Napier. Thereafter, soundings were taken by Mr. C. D. Kennedy, C.E., at the request of the Harbour Board and in accordance with Mr. Ferguson's advice. Mr. Kennedy's reports, seven in number, appear as pages 141 to 147 in the Commission's Exhibit No. 2. This experiment and the subsequent soundings provided data on most interesting and important problems in the matter of Inner Harbour construction. Firstly, there is the important evidence as to the practicability of dredging the entrance channel to the Inner Harbour in the open ocean, and this falls into two divisions—(a) Problems revealed by navigational and mechanical difficulties due to weather, seas, and ocean swell, and (b) problems revealed by the nature of the sea-bottom material as to its consistency and specific gravity and its suitability for suction dredging. Secondly, there is the evidence afforded by the soundings as to the effect of natural forces playing on the dredged patch. This includes all the evidence to be gleaned from Mr. Kennedy's soundings.

At this point again we come to a policy and course of action that we find hard to understand. The outstanding feature of this series of events at this stage is the important fact that Mr. Ferguson's excellent advice was not followed at all faithfully—in fact, what was done bears little resemblance to what Mr. Ferguson proposed. To begin with, Mr. Ferguson stipulated that a 10-acre patch at least should be dredged ("certainly not less than 10 acres," were Mr. Ferguson's words). He also said,