

port capable of being entered and left in any weather. It will not be a harbour of refuge for passing vessels in a storm, for there will be periods of storm when no vessel would approach the coast, let alone seek to enter this harbour. It is, however, capable of being constructed at a reasonable cost, as a harbour that under all ordinary conditions and at all states of the tide may be entered, used, and departed from by overseas vessels. It will, so constructed, be capable, in our opinion of affording shelter and facilities for working in most conditions of weather, although there will probably be times when, in view of approaching or developing bad weather, shipmasters will prefer to leave it and make for the open sea.

That these limitations exist are admitted by the most sanguine advocates of this harbour. We are favourably impressed by the service which this harbour has given during a period of forty years in an unfinished condition. We are of opinion that if it were completed by the extension of the breakwater, erection of the mole as designed, and by the erection of the new wharves with up-to-date facilities, by the deepening of berths and the reclamation of land to provide the necessary shore adjuncts, it will be a harbour that, in the words of the question before us, would be a suitable harbour, which we are prepared to recommend when the financial and economic factors make the work justifiable.

INNER AND BREAKWATER HARBOURS FROM THE NAVIGATIONAL POINT OF VIEW.

Broadly stated, our conclusion is that from the navigational point of view the Inner Harbour scheme is wholly condemned, because it requires ships to enter a channel 600 ft. wide and approximately one mile long, as an entrance to the inner channel between the moles. This outer channel is situated in the open ocean, and is exposed to winds and seas that ships seeking to enter the channel would find mostly abeam. It is also subject to a more or less heavy ocean swell, which is apt to be experienced even under the most perfect weather conditions at Napier. More than one of the ships' captains who gave evidence before us called attention to the perfectly fine weather conditions obtaining in Napier on the day on which he was speaking, testifying at the same time to the fact that out in the bay at the entrance to the proposed channel there was a pronounced ocean swell, and adding that on that day and under these conditions he would not like to attempt to take his ship into the proposed Inner Harbour.

Under the heading of "Engineering," on page 38 of this report, we include a quotation from Messrs. Maxwell, Williams, and Mason's report of the year 1900. The closing words of the paragraph from which we took that extract referred to the navigational aspect of the same difficulty, and we now add them, viz.: "In addition there would be some difficulty in navigating large vessels along such a channel during heavy weather with the seas sweeping at a considerable angle across the channel and breaking off either side of it." This opinion, expressed by engineers in 1900, was amply supported and justified in 1927 by the evidence of many experienced mariners who appeared before us.

We desire also to call attention to the evidence of Mr. J. P. Maxwell as to the effect of this unprotected open channel as an exposed opening to the Inner Harbour. He says (see page 355), after giving particulars of the destruction of shipping by a heavy "range" in the harbour of Madras, "The mistake was an exposed opening to the harbour." He continued: "I am of the opinion that the proposed entrance to the Inner Harbour here consisting as it does of 600 ft. channel dredged into the open ocean, is a mistake. Anything that may be deduced from a channel 400 ft. across and 20 ft. in depth gives no basis for forecasting what may happen in the case of an entrance 600 ft. wide and 30 ft. deep. I say that seas will sweep in and shipping will not be able to use it under such conditions." Mr. Maxwell, in his description of what had happened at Madras Harbour, spoke of ships and wharves being severely damaged, and he adds (see page 359), "It was the range at Madras Harbour that caused the trouble there, owing to a big entrance opening to the open sea." On the same page he says, "There would be a big range in the Inner Harbour just as it was at Madras, when constructed as proposed. The ships in the harbour would be unmanageable when the channel was widened, owing to the fact that the deeper the water the greater the waves and the greater their velocity. The harbour would be a dangerous trap for any ship."

A summary of the evidence of the navigational witnesses has been prepared, and it appears as Table J in the appendix. A study of this evidence shows that there is an overwhelming preponderance of expert navigator's evidence to the effect that overseas liners will not, except under ideal conditions and at high water slack, use the outer channel of the Inner Harbour. More than one of the witnesses stated that his standard of care is the avoidance of all risks. One witness pointed out that a single ship, loaded with an average cargo, seeking to use the channel, represents a risk in one bottom of from £1,250,000 to £1,500,000, and stated that he would take no avoidable risks whatever. The standard of care indicated by these answers is precisely that which we expected of master mariners and Marine Superintendents of the shipping companies. It is evidence of a nature which has not, so far as we can ascertain, been obtained and put before the Harbour Board and its constituents at any earlier stage of the harbour controversy. It is impossible to overestimate the importance of this evidence, seeing that the value of a harbour as a whole depends upon the safety of its entrance. The only evidence we heard with a contrary tendency to the foregoing came from the Harbour Board's consulting engineers, who, instancing the standard of conduct of lifeboat crews, expressed the opinion that the navigating witnesses who appeared before this Commission had displayed undue caution.

The conclusion we draw from the whole of this evidence is that the entrance channel to the Inner Harbour would be apt to be looked upon with great disfavour by maritime authorities and deep-sea captains using the port of Napier.