Outer Ports for Victoria.

Presidential Address, by George Higgins.

When it was suggested that I should give a Presidential Address on the occasion of my vacating the chair, I thought over the matter for some time, and eventually came to the conclusion that, in the case of a Society such as ours, where most of the members are young and looking forward, a resumé of past deeds in Engineering would not be so suitable as would be an attempt to look ahead. Another reason for not dwelling upon the past is that the Engineering works of the world are thoroughly described in the technical press, to which all have access, and a perusal of a complete description is preferable to a cursory reference such as might find place in a general address.

Accordingly, brief mention only need be made of the facts that irrigation, dust prevention, railway construction, tramway construction and electric traction are live subjects with us at present, and I propose to leave all these and limit my remarks to the subject of "Outer Ports for Victoria,"—a subject to which our State Ministry proposes to devote special attention in the near future. I use the expression "for Victoria" instead of "of Victoria" because, in time to come, it may be found that the most suitable ports for part of Western Victoria will be found on the South Australian coast.

Let us then look at the map of Victoria and part of South Australia, confining our attention to the coast line between Cape Howe in the East, and the mouth of the Murray in the West. A vessel sailing straight from promontory to promontory between these places would cover about 780 miles. This is nearly the same distance that a boat would travel if it started from Tweedmouth in the North of England, and sailed round the East and South coasts, finishing up on the West coast, where the British Channel begins.

But, while England has some 30 harbours of various sizes in this length, it is doubtful if Victoria possesses more than about 15 sites which are ever likely to be made use of for accommodating shipping. I refer to the following actual and possible places where harbours exist or where they may be placed, viz.;—

Malacoota Inlet, Gippsland Lakes (these are equivalent to many ports), Port Albert, Corner Inlet, partial shelter in various parts of Wilson’s Promontory, good shelter in Anderson’s Inlet, Western Port Bay, Port Philip Bay, including
Geelong Harbour and Hobson's Bay, Apollo Bay, Warrnambool, Portland, Port MacDonnell, Beachport, Kingston and Lake Alexandrina.

Of course immense sums have been spent, and are being spent in the United Kingdom on harbours. The thirty mentioned on the Eastern and Southern coasts are only a few of the many that exist all around the British Islands, and a new country like ours, with its scattered population, cannot expect to rank with Britain in this matter. The export of coal is important in the case of England. But still, with our magnificent climate and resources, it may be confidently expected that use will be made of every available site on our coast line, and it behoves us to plan our works now in such a way that extension may be possible when required.

With regard to the outer ports lying to the East of Port Philip Bay, I have only visited two of them, viz., Gippsland Lakes and Western Port Bay, and I have not much to say about these. No doubt, all present know the story of the good fortune which befel the designers of the Lakes Entrance works, when, just as the timber training walls were finished, a flood occurred, which caused a deep channel to be scoured out between the walls.

In Western Port Bay we have a magnificent natural harbour, affording good shelter and possessing ample depth. Possibly, the proximity to the Powlett River coal fields will render advisable the construction of coaling wharves at points close to the railway coming from the mines.

The Outer Port within Port Phillip Bay which is most worthy of note is Geelong. Observe the sheltered position of the harbour, not only to the north, south and west, but also to the east, where it is entered. Ridges project, below water level, one from the northern and one from the southern shore. These would effectually break any waves that might form with a long-continued easterly wind; but it has to be borne in mind that strong, lasting gales from the east are almost unknown. The harbour would be quite a good one without these ridges. It is the inner one that forms the "bar," as it is called, and which is being cut through, forming the Hopetoun Channel. The term "bar" is hardly correct here, as the ridge is not a shifting mass of sand or shingle, but is composed of stiff clay, containing layers of soft limestone. It is a good thing that it is so, because once a satisfactory channel will have been excavated, there will be no tendency for drift to close it up during storms. The thin layer of shells on the surface of the ridge will give no noticeable trouble, even if some of the shells are washed into the channel.

A great advantage possessed by Geelong Harbour is that no river or creek discharges into it. There is therefore nothing to cause silting up, so that, apart from geological up-
heavals, there is no reason why the depth of 30 feet, which exists over a considerable area, should ever be reduced. The wharves and piers within the harbour will, no doubt, be extended as traffic expands.

Apollo Bay I have not visited, and I do not know if it is proposed to embark on projects of extension; the traffic, I understand, is mainly connected with the carriage of timber from the forests to Melbourne.

Warrnambool is a port that presents many interesting problems. A fine breakwater has been partly constructed, which largely adds to the natural shelter which Lady Bay originally possessed. Extensions of this costly work will cause a larger area to be sheltered; but there is little room for doubting that ultimately, unless the material is very difficult to dredge, a basin will be excavated on the swamp called Lake Pertobe, and the surrounding land reclaimed with the earth taken out of the basin. The two points that need consideration in this case are, (1) the cost of dredging the basin with the channel approaching it; and (2) the keeping of the channel open. First, with regard to cost, this can be made wonderfully small. It is not yet generally known what can be done with properly designed suction dredging machinery; but it will be learned in time. Generally, in such cases, the value of the land reclaimed with the material excavated quite pays for the excavation. Of course, much depends upon the material. This should be ascertained by numerous bores on the line of the proposed approach channel and over the site of the proposed basin.

Secondly, with regard to keeping the channel open, it must be recognised that storms cause movements of sand and shingle along beaches, and we have to ascertain which direction the sand is likely to come from here.

What is the simplest way of ascertaining the direction of the drift? A groyne run out at right angles to the shore, and left there for a few years, would furnish the answer to our question. We would see on which side of the groyne the sand was permanently heaped up. I say "permanently" because the direction may vary as the wind blows from different quarters, and the magnitude of temporary changes should be observed. Frequent examinations by soundings should be made and the results plotted and dated. Especially should this be done after a gale.

Probably, in the present instance, the cheapest groyne for the purpose could be constructed by driving a row of sheet piling near the side of one of the jetties which formerly stood in the harbour.

It is known that Lady Bay is silting up gradually, but the process is so gradual that one may consider it most probable that the sand which accumulates on the beach comes from the west, most of it coming around the breakwater, but this ought to be ascertained positively by actual observation. The mag-
nitude of the deposit formed alongside the experimental groyne would determine whether or not expensive training would be required on either side of the entrance channel. Possibly, cutting the channel on the side of the experimental groyne which has not had sand heaped on it, would be all that would be required, making the groyne permanent.

In the event of insurmountable difficulties being encountered in connection with the channel and basin project, resort must be had to extending the breakwater and dredging away the deposited material from time to time.

Portland is naturally sheltered from the south-west, but rather exposed if gales blow from the south-east. I understand that the vessels that use this port have seldom much difficulty in approaching or leaving their berths or while lying at the piers. If further protection is needed, the cost of breakwaters will be heavy.

Examination of the bottom should be made to see if dredging close in shore can be accomplished without much expense.

Port Macdonnell lies on the South Australian side of the border, and steamers from Melbourne call there. The case is one of an open roadstead. Not having visited the place, I prefer not to discuss it. From the chart it would appear that, to form a harbour there, it will be necessary either to dredge a basin in from the coast or to construct breakwaters to enclose one.

Beachport seems to present many advantages from a harbour engineer's point of view. In some respects the case resembles that of Warrnambool. The possibility of forming a basin in Lake George, and a channel of approach thereto, should be inquired into. From information received, the material to be dredged is mainly sand; but the rate at which the sand would drift should be ascertained by constructing an experimental groyne as at Warrnambool.

Kingston and Lake Alexandrina I have not examined. The possibility of treating the latter in a way similar to that in which the Gippsland Lakes were dealt with has been suggested and should be carefully inquired into.

[The address was illustrated by lantern views of the various Victorian and South Australian ports mentioned. Those at Warrnambool and Beachport only, are here reproduced.]