

NORTH ISLAND MAIN TRUNK RAILWAY: LONGITUDINAL SECTION OF THE PORTION OF THE LINE BETWEEN PORO-O-TARAO AND MANGAONOHO, SHOWING THE HEIGHTS OF THE PRINCIPAL STATIONS ABOVE SEA LEVEL.

necessary appliances for expeditiously dealing with the various wants of passengers, including ice chests and cold-storage cupboards. The dining saloon will accommodate twenty-one passengers at a sitting, four at each table on one side of the aisle, and two at each table on the other side.

As a considerable portion of the journey will be made during the night, sleeping cars will also be attached to each train.

On such a journey the saving of time is, of course, an important consideration, consequently stopping places for the express train are likely to be fewer than we have hitherto been accustomed to. The details of the time-table have not yet been settled, of course, but the following has been suggested as probably suitable.—

NORTH.		SOUTH.	
Wellington	12.30 p.m.	Auckland	8.30 p.m.
Palmerston	4.15 p.m.	Frankton	11.45 p.m.
Marton	5.45 p.m.	Taumarunui	4.0 a.m.
Taihape	8.0 p.m.	Taihape	9.0 a.m.
Taumarunui	1.0 a.m.	Marton	11.0 a.m.
Frankton	5.15 a.m.	Palmerston	12.30 p.m.
Auckland	8.30 a.m.	Wellington	4.0 p.m.

There will also be a daylight train each way between Taumarunui and Taihape.

Obviously, therefore, as the central portion of the route will be traversed during the night by the up-express, the traveller from Wellington, who wishes to enjoy the magnificent mountain panorama and the gorgeous bush scenery along the route, should leave the train at Taihape and make his way by the slower mixed goods and passenger train across the central section, and connect with the fast train again at Taumarunui later in the evening. Taihape will be a suitable place to stop over, and good hotel accommodation can be obtained there. Probably suitable accommodation will also be obtainable on the Waimarino plateau, close to the mountain group, by the time the through trains are running.

OVERLAND FARES.

A welcome feature in connection with the opening of the line will be a reduction in the cost of the through journey, compared with present conditions. Calculating on the basis now in force, which is not likely to be increased, the ordinary fares should work out somewhat as follows —

Wellington to Auckland —

	1st. Class.	2nd. Class.
Ordinary Single	40/-	21/-
Ordinary Return	80/-	42/-
Excursion Return	71/-	35/6

These fares should certainly serve to popularise the route and ensure a good passenger traffic.

## THE NEW CUNARDERS.

A DESCRIPTION OF THE NEW 25-KNOT TURBINE PROPELLED EXPRESS CUNARD LINERS—THE LARGEST VESSELS IN THE WORLD—TRIUMPHS OF ENGINEERING

In last issue we described the turbines of these magnificent vessels, and, before proceeding to a detailed description of the steamers themselves, it will be found interesting to make a comparison of the largest vessels since Brunel's leviathan, the *Great Eastern*.

With the ordinary types of propelling machinery such tremendous horse power would be absolutely out of the question if the vessel were to pay its own way, owing to the enormous space required to contain it, while the coal bill and other incidental expenses would be so appalling that even the wealthiest steamship company would shrink from embarking upon such an enterprise. But the success of the Hon. C. A. Parsons' invention has facilitated the difficulties of both the constructor and the owners, since the machinery is exceptionally economical both as regards space occupied, weight and fuel consumption, at a given speed. High horse power, moreover, was imperative since the contract with the Government stipulated that the minimum average sea speed should be 24½ knots per hour, and to maintain this average under all conditions of weather necessitated an ample reserve of power. And as experience of the

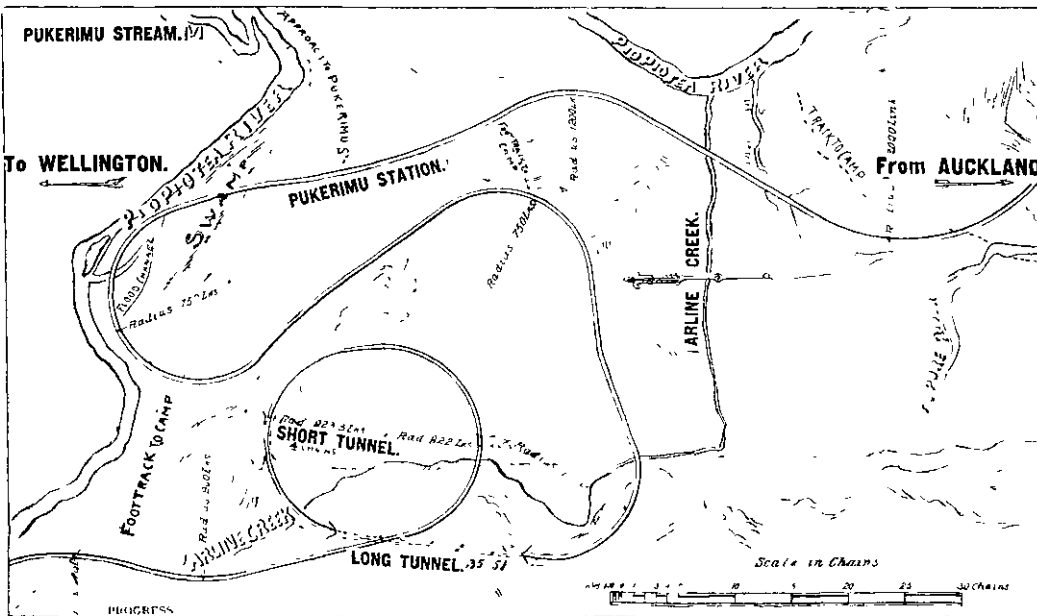
Vessel	Length over all			Displacement in Tons.	Horse power.	Speed knots per hour.
	ft.	ft.	ft.			
<i>Great Eastern</i>	692	83	57½	27,000	8,000	14.25
<i>Lucania</i>	625	65	42	19,000	30,000	22.01
<i>Oceanic</i>	704	68	49	28,500	28,000	19.50
<i>Deutschland</i>	686	67	42	23,000	37,500	23.5
<i>Baltic</i>	725	75	49	40,000	18,000	16.25
<i>Kaiser Wilhelm II.</i>	706	72	52½	37,000	40,000	23.5
<i>New Cunarders</i>	800	88	60	43,000	80,000	25

The new vessels, it will be seen, are the first to exceed in beam that of the *Great Eastern*, which has always been regarded as the standard of measurement in this particular. Recently the *Baltic* was the longest vessel afloat, yet it will be exceeded by no less than 60 ft.; the *Kaiser Wilhelm II* has the most powerful machine propulsion, yet it will be doubled. The foregoing table also affords striking testimony in regard to the price of speed, for whereas the *Great Eastern* with its 27,000 tons displacement and machinery developing 8000 horse power attained 14.25 knots per hour, in order to obtain less than twice the speed, ten times the horse power is employed, while to gain one and a half knots above the speed of the *Kaiser Wilhelm II*, twice the horse power of the latter vessel is required. It will be admitted that this is a heavy price for so apparently small a result.

turbine so far, both from naval and mercantile vessels, shows that when a given speed is stipulated the ultimate results are in excess of the contract, it is by no means unlikely that when the mammoth Cunarders settle down to their work the speed will be nearer 26 knots than 25.

The vessels have been christened the *Mauritania* and *Lusitania* respectively, the former being constructed at the well-known Clydebank works of Messrs. John Brown and Company, Limited, who have been responsible for many of the finest vessels in the Cunard fleet, while the latter is being built upon the Tyne at the Wallsend shipyards of Messrs. Swan, Hunter, and Wigham Richardson, Limited, one of the most prominent shipbuilding firms on the east coast. The designs represent the result of many months' careful consideration and experiments with models in the testing tank.

For example, originally the dimensions were somewhat more moderate, the length being about 700 ft. Elaborate tests were carried out, and then the length was decided at 720 ft., which in turn was advanced to 800. Again, at the time the contract was signed with the Government, the turbine, though successful in smaller commercial vessels, had not been subjected to the severe tests incidental to an Atlantic liner. The builders and engineers were thus embarking upon unbroken ground, and under the circumstances it was a plucky step to forego the well-tried and reliable reciprocating type of engines for the comparatively unknown turbine. The designers attacked the question in a most determined manner and erected experimental turbine plants. Indeed the building of the new vessels has bristled with engineering difficulties. Records in engineering work have been ruthlessly broken, and up to the present the various firms, though called upon to do work unprecedented in nature or proportions, have fulfilled their tasks with complete success. Owing to the enormous lengths of the vessels the building ships and facilities for handling the material have had to be completely overhauled and, in many instances special plants installed. By a curious circumstance two different types of erecting berths have been tested. The one at Wallsend is enclosed, that is to say, the slip is contained in a huge building, while that on the Clyde is quite open. In the former case the roofing provides exceptional



NORTH ISLAND MAIN TRUNK RAILWAY: DIAGRAM SHOWING THE "SPIRAL" AT RAURIMU (PUKERIMU).