

in the earthworks to adapt them to a wider gauge could not be executed at the cost of one-third of the saving between the 3 feet 6 inches and the 4 feet 8½ inches gauge. The increased cost of a broad gauge line would be in relation to the weight to be carried as well as to the actual increase in width. I have been employed on the Derbyshire, Staffordshire, Dublin and Drogheda, South Durham and Lancashire Union, and several other lines. The gauges on these English lines were 4 feet 8½ inches, on the Irish lines 5 feet 3 inches. It must be borne in mind that all the broad gauges are now being converted at an enormous expense to the 4 feet 8½ inch gauge. Speed and security are the advantages to be derived from the broader gauge. Security being the same, speed is the only advantage. I do not know the population of New Zealand. I consider a 3 feet 6 inch gauge would give all the accommodation required for many years. I am not sufficiently acquainted with the country of the Middle Island to state definitely what gauge should be adopted. I have not seen a railway of 3 feet 6 inches gauge worked with locomotives. Supposing there were two-thirds of good country favourable to railway lines, and one-third bad, the gauge and construction of the line through the bad country, in my opinion, ought to give way to the construction of the line through the good country. I have no knowledge of the 3 feet 6 inch gauge railway, but I understand that that gauge has been a mistake. With curves of ten chains radius, there would not be any material difference in safety between 4 feet 8½ inch and the 3 feet 6 inch gauge. There is a greater temptation to construct carriages used on narrow gauges to overhang to a greater extent than on broad gauges. I do not think sufficient information is derivable to enable the Legislature to decide on one uniform gauge.

Mr. Weaver, C.E., appeared before Committee, and examined.

I have had considerable experience in engineering in New Zealand. I am not at all acquainted with the character of the country of the Middle Island. I cannot give an opinion definitely as to any uniform gauge for the Middle Island. I have seen railways carried over very heavy country in New South Wales and Victoria. The gauge of the Government lines in New South Wales was the English narrow gauge, 4 feet 8½ inches, and the gauge in Victoria 5 feet 3 inches, the Irish gauge. The Government railway gauge in Queensland is 3 feet 6 inches. The relative cost between the lines now being constructed in New South Wales and Queensland is, that in New South Wales the average cost per mile of lines, rough very heavy country, is from £10,000 to £11,000 per mile; and in Queensland, from £8,000 to £9,000 per mile. I should think that the cost of construction on a line of 5 feet 3 inch gauge would be one-sixth to one-seventh more than the 4 feet 8½ inch gauge. The lines I refer to in New South Wales are through extremely heavy country, excavations almost entirely of sandstone rock. Gradients of 1 inch in 30 and 1 inch in 33 for two miles continuously, and on these gradients, curves of 6 and 8 chains radius and a zig-zag. And of course the rolling stock was made specially for the working of this line. Both the above estimates of cost per mile includes rolling stock. I may add the gradients are not so heavy on the Queensland lines. The 3 feet 6 inch gauge railway in Queensland, as a railway, has been a success, but as an economical railway, a failure, both in cost of construction and working expenses. This is partly owing to the natural difficulties of the country being under estimated, and partly to the increased cost of rolling stock, which had to be made especially for that line. The actual current working expenses of this line can hardly be estimated as yet, as the line is only recently opened. I doubt if there are any advantages in increasing the gauge beyond 4 feet 8½ inches. You lose very considerably, both in power and speed by diminishing the gauge below 4 feet 8½ inches, and also carrying capacity. I would not recommend a 3 feet 6 inch gauge for a main trunk railway through the country. There would be no serious engineering difficulty in adding on a third rail on the trunk lines to admit of rolling stock of tributary lines running over the main trunk lines. There would be no difficulty in running a 4 feet 8½ inch engine with 3 feet 6 inch trucks behind it, at a speed not exceeding twenty miles per hour, provided that a third rail was laid. The average speed maintained on Queensland lines is about twenty miles per hour. I consider a great advantage on the point of economy would be attained by adopting the 4 feet 8½ inch gauge, as railway plant in Britain is almost always made for that gauge.

The clerk was directed to summons Mr. Balfour and Dr. Hector for Thursday, 19th September, at 11 a.m.

The Committee then adjourned to Thursday, the 19th September, 1867, at 11 a.m.

THURSDAY, 19TH SEPTEMBER, 1867.

PRESENT:

Major Heaphy, V.C.
Mr. Curtis.
Mr. McNeill.
Mr. Moorhouse.

Mr. Macandrew.
Hon. J. Hall.
Mr. Tancred.

Mr. Burns, in the Chair.

The Committee met pursuant to adjournment, at 11 a.m.

The minutes of the previous meeting were read and confirmed.

Dr. Hector, F.R.S., appeared before the Committee, and gave the following evidence:

I am Director of the Geological Survey. I have had opportunities of examining the Middle Island; also a great part of the North Island, particularly Wanganui. From Nelson to Otago, a trunk line would follow the west by Jackson's Bay, then strike into the heart of the Province of Otago, about Lake Wanaka; this line, in my opinion, would be the best for opening up the mineral resources of the country. I do not think it would be possible to construct one trunk line that would serve the country. I do not think the completion of a through trunk line is necessary, with the facilities afforded by sea communication. Portions of such a trunk line might be constructed to act, in the first place, as feeders to the seaports, afterwards to be joined together to form one trunk line, when such expense could be warranted by the continuous settlement of the country. Transverse lines would be much cheaper than