NOTES ON MOUNT DUNDAS NARROW GAUGE RAILWAY.

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In speaking of narrow gauge railways in Tasmania, we must accept the term in its comparative sense. It is a general practice to describe all railways of a less width than 4ft. 8½in. as narrow gauge. Indeed, not many years since the term "narrow gauge" was applied to the 4ft. 8½in. guage, which is now called the standard gauge of England. The Tasmanian Railways, being of a gauge of 3ft. 6in., should properly be described as a narrow gauge system. What we have attempted to do on the West Coast is to construct a narrower gauge, viz., a 2ft. line, as being more suitable to local and financial conditions.

Although our 2ft. gauge line on the West Coast marks a new era in Government railway construction in Australasia, it must not be regarded in the light of an experiment. The oldest 2ft. gauge line, as far as I am aware, is the Festiniog line in Wales. To be accurate, the width of this line is 1ft. 11½in. The Festiniog Railway Company was originally incorporated in 1832, and commenced work as a tramway from Port Madock to certain slate quarries near Festiniog. In 1869 the Company was re-incorporated and the present line constructed at a cost of £10,727 per mile. The ruling gradients are comparatively easy as compared with our Tasmanian grades, viz., 1 in 80. The line is worked with double Fairlie engines, weighing 24 tons, and the Company pays rather better than 5 per cent. on its capital.

Of late years narrow gauge railways have been constructed in almost every country in the Continent of Europe, and largely in India.

The principal opponents to the construction of these narrow gauge lines are railway men who have had little or no experience in working them, and who make a bogey of the break of gauge. No railway manager would, of choice, agree to a break of gauge, but under certain conditions it becomes a necessity. Such a condition, for instance, as where the construction of a broad gauge railway would be an impossibility on account of the cost; *when in fact it becomes a question of a narrow gauge railway or no railway.*

The late Mr. Grierson, for many years General Manager of the Great Western Railway of England, whose name is a household world amongst railway men, was perhaps the one

English railway manager who had a practical experience of a break of gauge. Great as he found the disadvantage of it on his system, he admitted that there were conditions under which a break of gauge was necessary. In a discussion on the subject he spoke as follows :—"The truth was that some of those who were opposed to break of gauge under any circumstances had very much exaggerated the cost and damages arising from a transfer from one gauge to another. The delay and difficulties arising from a break of gauge were not of a serious nature. With regard to the construction of new lines of railway on a different gauge from that of existing lines, he could quite understand that there would be, and were, cases in every country in which that was a necessity, and even a *desirable* course to adopt, where, from the nature or amount of traffic, the character of the country, or other circumstances, narrow gauge branches would be sufficient for all commercial purposes without any serious disadvantages. It would then, and then only, be a question of constructing railways on the narrow gauge, or of having no railways at all ; and in such a position he would distinctly say (although it would be a misfortune to be placed in the position of choosing such an alternative) that the railway should be made, notwithstanding that the evil of a break of gauge was incurred."

I think the time is close at hand when we shall see country hitherto unoccupied in many parts of Australasia opened up by narrow gauge railways, as although every railway manager would do his utmost to avoid a break of gauge, the Australasian colonists cannot afford to throw away, as they have done in the past, millions of pounds upon unprofitable railways, that is, railways which do not pay interest on their enormous capital cost.

It is our great misfortune in these colonies that when railway construction commenced we followed too closely the practice of the Old Country. In England, where the railways are in private hands, they have been constructed purely on commercial principles, and the one thousand millions or so of capital invested brings in an average return of rather better than 4 per cent. Force of circumstances compels these companies to construct lines of a costly character (the average cost being rather more than £45,000 per mile), and keen competition has compelled them to furnish luxuries which the sparsely populated colonies of Australasia will not be able to afford for many years to come. Although it may be travelling outside the subject of my paper this evening, I may perhaps be permitted to remark that the conditions which brought railways into existence in these colonies were widely different to those pertaining to the lines in the Old

Country. Political and local considerations, more than commercial considerations, governed our railway construction in the past. And for this reason, unfortunately, we have even in Tasmania some lines which will not pay in the lifetime of our children, and possibly of our grand-children. The two principal reasons for this state of affairs are the high cost of construction (the average cost of the 3ft. 6in. gauge Tasmanian Railways being £8,400 a mile), and the policy of successive Governments of carrying our small quantity of goods traffic at a less average cost than the much larger quantities of goods are carried for in the other Australasian colonies. It may be an excellent thing for the country that it is the policy of the Government to carry the native coal of Tasmania at a rate averaging 50 per cent. less than the same article is carried for in New Zealand, as well as many other lines of traffic at rates less than the average of the other Australasian colonies. But it is only fair, I think, when discussing the financial position of our railways to take into consideration the hidden profits and the great advantages which are derived by the users of our railways.

It may be some satisfaction to us, however, to remember that Tasmania is not the only country which has constructed unprofitable railways. America, which takes the lead in so many matters, has beaten us here. By the last returns I have in my possession I find that considerably more than 60 per cent. of the total stock of the American railways was paying no dividend whatever. £562,000,000 invested in railways returns nothing to stock holders. During the first six months of the year 1892, 24 railway companies, owning between 9,000 and 10,000 miles of railways, became insolvent, and during the history of American railways considerably more than half of them have at one time or another passed into the hands of receivers. With all her errors, Tasmania is not likely to put up a similar record.

But, to come to my subject, the 2ft. gauge line from Zeehan to North-East Dundas. There is a large area of country waiting to be opened up in this colony. On the North-West Coast, inland from Table Cape, through Flowerdale, are thousands of acres of valuable land unoccupied, or carrying a few head of cattle, because there are no means to bring produce to market. The same may be said of other districts in the North of the island. On the West Coast there is a large tract of country rich in minerals, rugged, broken, difficult of access, and in a climate where the rainfall is measured by feet instead of inches. Without means of access the minerals cannot be developed. The colony is not in a position to continue its past policy of railway construction. It cannot construct another Sorell line at a cost of over

£9,000 per mile, nor another Apsley line ending at a stump in a paddock, 10 miles from anywhere. Some means had to be found to open up the country at a cost which the circumstances of the colony could afford. After much consideration the Government decided to initiate a scheme of railway construction within the means of the colony, and which would be fully capable of carrying all the traffic that might offer. In constructing the line from Zeehan to North-East Dundas, that is to say to the foot of Mount Read, we have adopted the gauge of the Darjeeling line, a narrow gauge railway which has given most successful results, and there is every reason to believe that our line will achieve a similar success. In this connection I am pleased to be able to say that the cost of our line will be less by at least one-half the cost of the Indian line referred to.

The North-East Dundas Line, starting from the Zeehan terminus of the Strahan-Zeehan Railway, runs north-eastward during the whole of its course. The first four miles are through comparatively easy country. The line then commences to ascend, and at 10½ miles, after twisting and turning in the remarkable manner which you will observe from the beautiful limelight views which will be exhibited this evening, it reaches an altitude of 1,015ft. above Zeehan, or 1,550ft. above sea level. After the first five miles the country is extremely broken, and the line consists entirely of steep gradients and sharp curves. The steepest grade on the line is 1 in 25, in combination with curves of 1½ chains radius.

The scenery in parts of this line, especially where the rivers are crossed by timber bridges, is particularly beautiful and interesting. Further than the eye can reach, say for a distance of 40 miles, there is an immense myrtle forest, the foliage of which is so dense that when viewed from a distance the tops of the forest present the appearance of rolling downs.

The rolling stock in use on the line has all been constructed in the colony, with the exception of the locomotives. Our standard locomotive was built by Messrs. Sharp, Stewart, and Co., of Glasgow, and weighs in working order 19 tons 15 cwt. It takes a load of rather better than 50 tons up a grade of 1 in 25. The goods trucks carry a net load of 10 tons, the weight of the truck being only 2 tons 14 cwt. Thus, we are able to negotiate grades of 1 in 25, in combination with curves of 1½ chains radius, with a paying load of 40 tons per train. Therefore, supposing the traffic grows sufficiently to run four full trains each way daily, the carrying capacity of the line, with four daily trains in each direction will be 100,000 tons

per annum, and this could be doubled by increasing the number of trains.

I am afraid that I have already occupied your attention too long, and should weary you too much were I to touch more than briefly upon the dry subject of figures. In a few words, the class of railway will be understood from the following short description :—

Gauge, 2ft.; maximum gradient, 1 in 25 ; curves, minimum radius 99ft. ; width cleared, 30ft., to be increased where necessary.

I may here mention that the clearing for a chain on each side of the line is being let to firewood getters, who clear the line for the value of the firewood, paying freight for its carriage to the terminus of the line. The wood is stacked at convenient places and picked up by ballast trains.

The cuttings are 10ft. in width at base, and banks 10ft. in width at top. The bridges are all timber, built of stringy bark and blue gum. The culverts are log culverts and timber boxes, made from local timber, chiefly celery top pine.

The quantity of ballast is 800 cubic yards per mile, being 4in. in depth under the sleepers.

The sleepers are 5ft. by 8in. by 4in. of stringy bark and blue gum.

The rails and fastenings (except dog-spikes which have been made in the colony) are second-hand from the broader gauge railways. The rails are of steel, 46lbs. and 40lbs. to the yard.

The goods trucks, which are on bogies, have a carrying capacity of 10 tons, and weigh 2 tons 14 cwt. each. Passenger cars seat 18 passengers, but we have had a car designed, which we are about to construct, seating 26 passengers. The carriages and trucks were designed and built in the railway workshops.

In addition to the usual hand brakes, all the stock is fitted with the vacuum brakes.

The construction of the railway is being carried out in all its branches by piece work and day work, under a resident engineer, with very satisfactory results, both as to workmanship and cost. The daily wage paid on this work is 7s. The cost of the line, including surveys, construction, and equipment, is approximately £2,000 per mile.

In further justification of the adoption of the class of line I have described this evening, I may say that we are constructing and equipping nearly 20 miles of railway at a cost

of about £40,000, and it is doubtful if a line of our ordinary or 3ft. 6in. gauge could be constructed through the same country at a cost of £10,000 per mile, or say £200,000. The interest at 3½ per cent. on £40,000 is £1,400 per annum. The interest on £200,000 (which would be the cost of a 3ft. 6in. gauge line) at 3½ per cent. would be £7,000 per annum, showing a saving in interest in favour of the 2ft. gauge line of £5,600 per annum. This difference in interest on the cost of the two lines at compound interest would in less than seven years be more than the total outlay in constructing and equipping the 2ft. gauge railway. In other words, by constructing the line on the principles we have adopted, its total cost is defrayed by what would be the interest on a 3ft. 6in. gauge line during the first seven years of its existence.