RAILWAYS.

I N a country like Australasia, ill-supplied with navigable rivers, railway construction is abalated way construction is absolutely necessary to its proper development. This was recognized from an early period, but the difficulty of obtaining money at anything but a prohibitory interest long stood in the way of the construction of railways. Nevertheless, as will be seen, very considerable progress has been made, especially of late years; indeed, by far the greater portion of the Public Debt of Australasia has been contracted for railway purposes. As the extent of territory in Australasia almost equals that of Europe or the United States of America, while the population numbers less than four millions, it is almost needless to say that many of the lines run through districts very sparsely peopled. This is particularly the case with Queensland, South Australia, and Western Australia, where there are vast tracts of territory in which little in the nature of permanent settlement has yet been accomplished; and in none of the Colonies can it be said that the railway lines traverse thickly-settled areas. Notwithstanding these drawbacks the Railways of Australasia collectively yield a net return equal to 2.97 per cent. on the outlay.

The colonies of Victoria, South Australia, New Zealand, New South Wales, and Queensland have found it expedient to place the management and maintenance of railways under the control of Commissioners. Victoria, in 1883, was the first colony to adopt this system ; four years later South Australia and New Zealand saw the wisdom of the change, while New South Wales and Queensland followed in 1888. Each of these colonies has appointed three officials as Commissioners, and has conferred upon them by law large executive powers, amounting to almost independent control, the object aimed at being to obtain economic management free from political interference. In New South Wales and Victoria an additional safeguard in railway construction prevails. All proposed new lines before being sanctioned are submitted to a committee selected from Members of both Houses of Parliament. These committees take evidence as to the suitability of the route proposed, the probable cost of construction, the prospect of the line paying, and the grades to be adopted. Upon the evidence taken they draw up reports for or against the schemes proposed. This careful supervision of railway development has already been attended with success, and it is a matter of regret that such committees were not earlier constituted, as probably the Colonies would have been saved much useless railway construction and unnecessary expense.

The question of establishing railway communication with the interior from Sydney was agitated as far back as 1846, but it was not until the enormous accession to the population of these lands, which followed upon the discoveries of gold, that the matter was carried to a successful issue. The earliest railways were begun almost at the same time in New South Wales and Victoria. The works were, indeed, actually first commenced in New South Wales, but the first railway line opened for traffic was the Melbourne and Hobson's Bay line in 1854, 25 miles in length. No further extensions were opened in Victoria until 1857. In the first instance in both colonies the construction of the lines was undertaken by private enterprise; but the companies that pioneered the way in regard to railway construction soon found the magnitude of the undertaking beyond the scope of their funds, and it was apparent that only the Government could hope to keep pace with the needs of the country in this direction. The private works already begun in New South Wales were, therefore, bought up by the Government in 1854, and all such lines fell into Government hands in Victoria one year later, with the exception of the Hobson's Bay railway, which was not acquired till 1878. From 1855 the Governments of the two colonies undertook and carried on the work of railway extension.

In New South Wales 14 miles of railway were placed under traffic in 1855. This was the line from Sydney to Parramatta, and a further length of 9 miles was added in the following year. The first State railway-works in South Australia were undertaken in 1857; they were begun in New Zealand in 1860; in Queensland in 1864; in Tasmania in 1868; and in Western Australia in 1874.

From the humble beginnings mentioned above the mileage of the various systems throughout Australasia had increased to 12,756 in 1892, of which 11,962 miles belong to the State, and 794 miles are under private control. From 1854 to 1863 the mileage opened yearly averaged 40; for the succeeding ten years the average was 110 miles; from 1874 to 1883 it averaged 509 miles; and for the eleven years ended with 1893 the average yearly addition was 601 miles. The total mileage

	Miles or	ened.		Miles o	pened.
Year.	Total.	During each year.	Year.	Total.	During each year
1854 1855 1856 1857 1858 1859 1860 1861 1862 1863 1864 1865 1866 1866 1867 1868 1869 1870 1871 1872 1873	$\begin{array}{c} 2\frac{1}{3}\\ 16\frac{1}{2}\\ 32\frac{1}{2}\\ 117\\ 132\\ 171\\ 215\\ 242\\ 372\\ 399\\ 474\\ 494\\ 524\\ 718\\ 789\\ 918\\ 1,040\\ 1,135\\ 1,273\\ 1,498\\ \end{array}$	$\begin{array}{c c} 2\frac{1}{2} \\ 14 \\ 16 \\ 84\frac{1}{2} \\ 15 \\ 39 \\ 44 \\ 28 \\ 130 \\ 27 \\ 74 \\ 21 \\ 29 \\ 194 \\ 71 \\ 129 \\ 194 \\ 71 \\ 129 \\ 192 \\ 95 \\ 138 \\ 225 \\ \end{array}$	1874 1875 1876 1877 1878 1879 1880 1881 1882 1883 1884 1885 1884 1885 1885 1885 1885 1885	$\begin{array}{c c} 1,700\\ 2,144\\ 2,678\\ 3,976\\ 4,393\\ 5,526\\ 6,169\\ 6,587\\ 7,425\\ 7,881\\ 8,669\\ 9,498\\ 10,230\\ 11,074\\ 11,713\\ 12,174\\ 12,405\\ 12,756\\ \end{array}$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

opened in Australasia, and the extensions during each year since railways were first undertaken, will be found below :---

In 1883 a junction was effected between the New South Wales and Victorian lines at the river Murray; three years later direct communication was established between Victoria and South Australia; and in 1888 the last mile of line connecting Sydney with the northern colony was completed, thus placing the four Capitals, Brisbane, Sydney, Melbourne, and Adelaide in direct communication with each other. Proposals have been made to the Government of Western Australia to construct a railway upon the land-grant system, connecting the eastern districts of the colony with South Australia. It is proposed to extend the lines to Eucla, close to the South Australian Border, and when that colony has extended her railways to the same point, Perth will be connected with all the capitals of the Australian Colonies. Should this be carried out, the European mails will, in all likelihood, be landed at Fremantle, and sent overland to the various destinations throughout the continent.

Unfortunately no agreement was carried out between the Colonies asto the adoption of an uniform gauge. As far back as 1846 the 4-ft. 8½-in. gauge was recommended by Mr. Gladstone for any railways



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that might be constructed in New South Wales, and this recommendation was confirmed two years afterwards by the English Railway Commissioners. But in 1850 the Sydney Railway Company decided upon adopting the 5-ft. 3-in. gauge, and in 1852 an Act was passed which provided that the gauge of all railways in the Colony should be 5 ft. 3 in. In 1853, however, the Sydney Railway Company, having changed their engineer, altered their views with regard to the question of gauge, and applied to have the 4-ft. 82-in. gauge substituted for the 5ft. 3 in., and succeeded in repealing their Act, and in passing another which made the narrower gauge imperative. This step was taken without the concurrence of the other colonies, and feeling ran very high in Victoria in consequence, as two of the railway companies in that Colony had already given large orders for rolling-stock on the 5-ft. 3-in. gauge. Until the lines of the two colonies met on the boundary no discomfort was, of course, experienced; but since then the break of gauge, and the consequent change of trains, has been a source of irritation and inconvenience. The South Australian Government adopted at the outset the 5 ft. 3 in. gauge of Victoria; but finding that the construction of lines of this gauge involved a heavier expense than they were prepared to face, the more recent lines were built on a gauge of 3 ft. 6 in. In that colony there are 511 miles laid with the 5 ft. 3 in. gauge, and 1,320 with that of 3 ft. 6 in. The line joining Adelaide with the Victorian Border, as well as several of the other trunk-lines, have been constructed on the wide gauge, so that the line from Melbourne to Adelaide is uniform. The private line, which prolongs the South Australian system into New South Wales as far as Broken Hill, is on the 3 ft. 6 in. gauge. All the Queensland lines are built on the gauge of 3 ft. 6 in., so that transhipment is necessary on the boundary between that colony and New South Wales. The difficulty caused by this diversity of gauge is already found to be troublesome. It is admitted on all hands that the trouble can be got over only by establishing uniformity of gauge, and every year in which action is delayed will make the establishment of that uniformity more costly. Tasmania, Western Australia, and New Zealand have adopted the 3 ft. 6 in. gauge. The first line laid down in Tasmania was on the 5 ft. 3 in. gauge, but it was soon altered to 3 ft. 6 in. The total length of line in Australasia laid down to a gauge of 5 ft. 3 in. is 3,489 miles; there are 2,355 miles of the 4 ft. $8\frac{1}{2}$ in. gauge, and 6,912 miles of the 3 ft. 6 in. gauge. By the purchase of the Main Line Company's property in 1890, and by taking over other private lines since, the Tasmanian Government now controls a system of 420 miles of railway open for traffic.

The population and area of territory per mile of line open varies considerably. As regards population per mile of line open, Western Australia, South Australia, and Queensland—the most extensive colonics—show most favourably; but, in comparison per mile of line open to the area of the territory, Victoria, New Zealand, and Tasmania take

	Per mile of line open.			
Colony.	Population.	Square miles of Territory.		
New South Wales	492	128		
Victoria	399	30		
Queensland	179	284		
South Australia	189	494		
Western Australia	80	1,516		
Tasmania	326	56		
New Zealand	315	51		
Australasia	316	248		

In the following table are shown the population and area of territory per mile of line open in other countries. Of course a comparison can only be made fairly between Australasia and other young countries in process of development :---

Countries.	Length of Railway.	Population per Mile of Line.	Area per Mile of Line.
United Kingdom France Germany Austria-Hungary Belgium Netherlands Switzerland Sweden and Norway Spain Italy India (British) Canada (Dominion of) Cape Colony Argentine Republic Brazil Chili Mexico United States of America.	miles. 20,325 21,605 26,971 17,993 2,810 1,630 2,082 6,225 6,708 8,686 18,042 14,588 2,444 8,023 6,651 1,735 6,900 171,000 12,756	$\begin{array}{c} 1,875\\ 1,775\\ 1,833\\ 2,374\\ 2,160\\ 2,865\\ 1,401\\ 1,094\\ 2,618\\ 3,516\\ 15,920\\ 331\\ 625\\ 531\\ 2,105\\ 1,653\\ 1,653\\ 1,687\\ 368\\ 316\end{array}$	sq. miles. 6 9 8 15 4 8 8 47 29 13 86 227 91 140 483 169 111 20 248

The progress of railway construction, except, perhaps, in the case of Victoria, was anything but rapid during the earlier years. This was in a great measure owing to the sparseness of the population, and the

EXTENSION OF RAILWAY LINES.

natural fear that the income would not justify the expense of widelyextended lines. It was also due in some degree to the low estimation in which Australasian securities were held in London, and the consequent high rate of interest at which money for railway construction had to be borrowed. The initial difficulties attendant on railway construction may be said to have ended about 1871, for since that year progress has been made by all the Colonies. The mileage under State and private control for each colony during each period shown was :--

Colony.	1861.	1866.	1871.	1876.	1881.	1886.	1891-92.	1892-93.
New South Wales Victoria Queensland South Australia Western Australia Tasmania New Zealand Australasia	73 114 * 56 * * * 243	143 275 50 56 * * * 524	358 276 218 133 * 45 · 105 1,135	554 718 298 308 38 45 718 2,679	$1,040 \\ 1,247 \\ 800 \\ 845 \\ 92 \\ 168 \\ 1,334 \\ 5,526$	$\begin{array}{c} 1,941\\ 1,754\\ 1,433\\ 1,226\\ 202\\ 303\\ 1,810\\ \hline 8,669\end{array}$	$\begin{array}{r} 2,266\\ 2,903\\ 2,320\\ 1,823\\ 657\\ 425\\ 2,011\\ \hline 12,405 \end{array}$	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$

* Railways not in existence.

The following table shows the length of Government Railways under construction during 1893 :---

New South Wales	Miles.	Tasmania	Miles *
Victoria	.107	New Zealand	188
Queensland	59		
South Australia	59	Total	804
Western Australia	292		

Notwithstanding the energetic expansion of the railway systems throughout Australasia since 1881, there is still room for considerable extension. In South Australia railway construction is entirely confined to the south-eastern corner and to the extension of the Northern Line, which has its present terminus at Oodnadatta, 686 miles from Adelaide. It is proposed to eventually extend this line as far north as Pine Creek, the southern terminus of the Port Darwin line. When this railway is completed direct overland communication will be established between the northern and southern portions of the continent. The length of the gap between the terminus at Oodnadatta and that at Pine Creek is 1,140 miles on the telegraph route. An English syndicate offered to complete this railway on the land-grant system, but so far no decision has been arrived at. In New South Wales the railway extensions will be chiefly confined to perfecting the various systems already constructed. In Queensland, with its vast expanse of partly-settled territory and extensive seaboard, the railways are being constructed in separate systems. The

lines commence from each of the principal ports and run inland, but there is no doubt that not many years will elapse before these systems will become branches of a main trunk-line which in all likelihood will be the Brisbane-Charleville line extended as far as Normanton at the Gulf of Carpentaria. A motion has been carried in the Queensland Parliament affirming the desirability of allowing private enterprise to construct in the South, Central, and Northern Divisions of the Colony eleven railway lines under the provisions of the Railway Construction Land Subsidy Act.

In Victoria, Tasmania, and New Zealand the railways are well developed, compared with size of territory, and any future extensions in these colonies will hardly be on as large a scale as those of the other colonies. It is the established policy of each colony to keep the railways under State control, and only in extreme circumstances is that policy departed from. In two of the colonies—Victoria and Queensland—the lines are entirely in the hands of the Government, although such was not the case always in the former colony, and in none of the Colonies except Western Australia is the extent of private lines considerable when compared with that administered by the State. The following statement shows the gauge and length of the private railways of Australasia :—

Colony.	Line of Railway.	Gauge.	Length.
New South Wales South Australia Western Australia Tasmania New Zealand	Deniliquin-Moama Cockburn-Broken Hill Clyde-Rosehill Warwick Farm Woodville-Grange Adelaide-Glenelg (two routes) Albany-Beverley Guildford-Walkaway Great Southern Railway-Torbay Guildford-Darling Range. Rockingham-Jarrahdale and Inland Flinders Bay-Inland Quindalup-Forest Locheville-Timber Station Emu Bay-Waratah Wellington-Manawatu Kaitangata-Stirling Midland Railway	ft. 536122 3342536666666666666666666666666666666666	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
	. Total		794 16

A proviso has been inserted in the charters of the companies owning the private lines in New South Wales, whereby, after a certain date, the Government can, if disposed, acquire the lines at a valuation. Similar conditions are found in most of the charters granted by the other colonies permitting the construction of private lines.

The length of lines under the control of the Governments of Australasia is 11,811 miles, exclusive of 151 miles in the Northern Territory, constructed and equipped at a cost of £119,835,742, or an average of £10,146 per mile. The cheapest constructed lines were those of Western Australia, where the average rate has not exceeded £4,441 per mile. In Victoria the figures stand at £12,665, and in New South Wales at £14,743 per mile. The following are the details of the Government railways in Australasia, the Northern Territory of South Australia being' excluded:—

Colony.	Length of line open.	Gauge.	Total cost of Construction and Equipment.	Average cost per mile.
New South Wales Victoria Queensland South Australia Vestern Australia Fasmania New Zealand Australasia	miles. 2,351 2,933 2,353 1,664 204 420 1,886 11,811	$ \begin{array}{c cccc} \text{ft. in.} & 4 & 8\frac{1}{2} \\ 5 & 3 \\ 3 & 6 \\ 5 & 3 \\ 3 & 6 \\ 3 & 6 \\ 3 & 6 \\ 3 & 6 \\ \end{array} $	£ 34,657,571 37,462,372 16,746,195 11,830,590 905,974 3,499,920 14,733,120 119,835,742	£ 14,743 12,665 7,117 7,109 4,441 8,338 7,822 10,146

It would hardly be fair to institute comparisons between the cost of construction per mile in Australasia and in the densely-populated countries of Europe, for while in Europe the resumption of valuable ground is, perhaps, the heaviest expense in connection with the building of railways, in the Colonies this item of expenditure is not of leading importance. The cost per mile in certain sparsely-settled countries is given thus :---

Canada	£11,904
Cape Colony	. 8,580
United States	13,027
Argentina	9,702
Mexico	9,417
Chili	6,358
Brazil	8,104

while for Australasia it is $\pounds 10,146$.

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Every colony shows a surplus of revenue over working expenditure, notwithstanding that the avowed object of railway construction in the Colonies has been to promote settlement, apart from considerations of profitably working the lines. At the same time the principle has been kept in view that in the main the railways should be self-supporting.

The gross and net revenue for 1892–93, with the working expenses, were as follow :---

Colony.	Gross Revenue.	Working . Expenses.	Net Revenue.
,	£	£	f
New South Wales	2.927.056	1.738.516	1.188.540
Victoria	2.925.948	1.850.291	1.075.657
Queensland	1,041,222	632,321	408,901
South Australia	1,068,503	655,570	412.933
Western Australia	94,201	90,654	3,547
Tasmania	176,926	161,586	15,340
New Zealand	1,181,522	732,142	449, 380
Australasia	9,415,378	5,861,080	3,554,298

The returns for the first four colonies are for the year ending 30th June, 1893; New Zealand for 31st March, 1893; and Western Australia and Tasmania for 31st December, 1892.

The following table shows the proportion of working expenses to gross revenue for each colony in 1892–3. In four colonies the proportion of the working expenses to gross revenue was below the average for Australasia. These were New South Wales, Queensland, South Australia, and New Zealand. Victoria was a trifle over the average, but Tasmania and Western Australia were largely in excess. The best position for the year in question was occupied by New South Wales, where 40.6 of the total takings remained to the good after the working expenses were paid; while in Tasmania over £91 and in Western Australia more than £96 out of every £100 received went to defray the cost of working the lines.

Colony.	Working Expenses— Proportion to Gross Revenue. 1892-93.
New South Wales Victoria Queensland South Australia Western Australia Tasmania New Zealand Australasia	$\begin{array}{c} \text{per cent.} \\ 59.4 \\ 63.2 \\ 60.7 \\ 61.3 \\ 96.2 \\ 91.3 \\ 61.9 \end{array}$

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The average interest payable on all Australasian loans is 3.96 per cent., and the returns yielded by the railways is 2.97 per cent., showing a loss in working of 0.99 per cent., equivalent to £1,186,400. The figures are :---

Colony.	Interest returned on Capital.	Average Interest payable on Capital Expenditure.	Average Loss.
New South Wales	per cent. 3.48	per cent.	per cent. 0:34
Victoria	2.87	3.99	1.12
Queensland	244	3.93	1.49
South Australia*	3.49	4.08	0.20
Western Australia	0.39	4.09	3.70
Tasmania	0.43	4.19	3.76
New Zealand	3.02	4.02	1.00
Australasia	2.97	3.96	0.99

* Northern Territory not included.

The rate of return on capital which is shown in the foregoing table represents the interest on the gross cost of the lines. In some cases the nominal amount of outstanding debentures is less than the actual expenditure on construction and equipment, owing to the fact that in these cases some loans have been redeemed, but as the redemption has been effected by means of fresh loans charged to general services, or by payments from the general revenue, and not out of railway earnings, no allowance on this account can reasonably be made.

The subjoined table shows the rate per cent. realized on capital expenditure for the last five years for those colonies where the management is under the administration of Commissioners :---

Colony.	1888-9.	1889-90.	1890-1.	1891-2.	892 - 3.
New South Wales Victoria Queensland South Australia New Zealand	per cent. 3·14 3·73 0·84 4·05 2·60	per cent. 3·18 2·91 1·70 5·03 2·97	per cent. 3.60 2.72 1.74 5.32 2.95	per cent. 3·58 · 2·58 2·57 4·38 2·79	per cent. 3.48 2.87 2.44 3.49 3.05

The following table shows the gross earnings, expenditure, and net profit per average mile open. In 1881 the New South Wales railways yielded 5.31 per cent.—a higher rate of interest on the capital cost than was ever reached before or since. In the same year the Victorian lines yielded a return of 4.04 per cent., which is the highest on record with the exception of 4.18 in the year 1886. The decline in the net profits

RATE OF RETURN PER MILE.

is largely due to the extension of the lines in sparsely-populated districts. There is no doubt that with more limited extensions of this class, before long the Colonies will equalise the difference between net revenue and the interest on capital cost. The returns per average mile open were :---

Colony.	Gross Earnings.		Expen	diture.	Net Profit per Average Mile open.	
	1891-2.	1892-3.	1891-2.	1892-3.	1891-2.	1892-3.
New South Wales Victoria Queensland South Australia Western Australia Tasmania New Zealand	£ 1,423 1,094 458 679 334 458 598	$\begin{array}{c} \pounds \\ 1,264 \\ 1,055 \\ 422 \\ 642 \\ 461 \\ 424 \\ 626 \end{array}$		$ \begin{array}{c} \pounds \\ 750 \\ 631 \\ 269 \\ 394 \\ 444 \\ 385 \\ 388 \end{array} $	$ \begin{array}{c c} \pounds \\ 546 \\ 338 \\ 180 \\ 311 \\ 19 \\ 57 \\ 219 \end{array} $	$\begin{array}{c} \pounds \\ 514 \\ 424 \\ 173 \\ 248 \\ 17 \\ 36 \\ 238 \end{array}$
Australasia	851	797	543	496	308	301

The following is a co-relative table showing the returns per train mile :— -

Colony.	Gross Earnings.		Expenditure.		Net Profit per Train Mile.	
	1891-2.	1892-3.	1891-2.	1892-3.	1891-2.	1892-3.
New South Wales Victoria Queensland South Australia Western Australia Tasmania New Zealand	$\begin{array}{c} \text{d.} \\ 89\cdot 3 \\ 62\cdot 9 \\ 63\cdot 8 \\ 70\cdot 0 \\ 48\cdot 5 \\ 44\cdot 6 \\ 88\cdot 9 \end{array}$	$\begin{array}{c} d. \\ 93 \cdot 5 \\ 65 \cdot 0 \\ 60 \cdot 1 \\ 66 \cdot 3 \\ 53 \cdot 8 \\ 47 \cdot 7 \\ 73 \cdot 0 \end{array}$	d. 54·9 43·5 38·8 37·8 45·7 39·1 56·3	d. 55*5 41*0 36*5 40*7 51*8 36*6 45*3	$\begin{array}{c} \text{d.} \\ 34\cdot 3 \\ 19\cdot 5 \\ 25\cdot 0 \\ 32\cdot 3 \\ 2\cdot 8 \\ 5\cdot 6 \\ 32\cdot 6 \end{array}$	$\begin{array}{c} \text{d.} \\ 38.0 \\ 24.0 \\ 23.6 \\ 25.5 \\ 2.0 \\ 11.1 \\ 27.7 \end{array}$
Australasia	72.4	74.4	46.2	45.9	26.2	28.5

In some of the colonies the railways pass through heavy and mountainous country, involving steep gradients. This is particularly the case in New South Wales, where the lines are most exceptional in their character, having been constructed with an unusual proportion of steep gradients, the worst being on the trunk-lines, and so situated that the whole of the traffic has to pass over them. In the Southern system the line at Cooma reaches an altitude of 2,659 feet above the sea-level; on the Western, at the Clarence station, Blue Mountains, a height of 3,658 feet is attained; while on the Northern line the highest point,

RAILWAYS, 1893-4

Statistics relating to the New South Wales Railways for the year ended 30th June, 1894, were published while this volume was being printed. The figures show a gross revenue of £2,813,541, and working expenses £1,591,842, leaving a net profit of £1,221,699. This is the largest contribution to the general revenue yet made by the railways, and must be looked upon as a notable achievement, as the year was one of intense business trouble throughout Australasia. . The satisfactory result indicated was brought about by a reduction in working expenses, which amounted to only 56 58 per cent. of revenue, as compared with 59.39 in 1893, 61.60 in 1892, and 66.69 in 1888. The gross earnings per train mile for the year 1894 were 7s. 101d., while the working expenses amounted to 43. 51d., leaving a net profit of 3s. 5d. Both the gross and the net earnings were largely in excess of the results obtained when the Commissioners took office, the increase in the former being equal to 15 per cent., while the net earnings showed an increase of about 50 per cent. A comparison of the working of the railways of all the Colonies for the year ended June, 1894, would have been specially interesting, in view of the successful results shown by the New South Wales Railways. Unfortunately, such a comparison cannot be made, as the detailed reports of the other Colonies have not yet been published.

4,471 feet, is reached at Ben Lomond. In no other colony of the group do the lines attain such an altitude. In Queensland the maximum height is 3,008 feet; in Victoria, 2,452 feet; in South Australia, 1,970 feet; and in New Zealand, 1,252 feet. In the colonies where heavy gradients prevail the working expenditure must necessarily be heavier than in the colonies where the surface configuration is more level.

The interest on capital cost, the proportion of working expenses to the gross revenue, and the returns per train mile for some of the principal countries, is given below. The figures refer either to the years 1890 or 1891:—

	Capi	Capital Cost.			Per Train Mile.			
Country.	Total.	Per Mile Open.	Return Per Cent.	tion to Gross Revenue.	Gross Revenue.	Working Expenses.	Net Revenue.	
United Kingdom France Germany Austria-Hungary Belgium United States Canada Cape Colony Australasia	£ 919,425,421 569,080,000 512,951,000 305,042,000 57,157,721 1,831,083,000 168,034,518 16,949,722 117,968,937	£ 45,536 27,375 20,201 19,516 28,271 11,205 11,483 8,968 10,113	p. cent. 4.0 3.9 5.6 3.4 4.0 3.9 1.6 4.6 3.0	per cent. 55.0 52.5 55.3 53.1 59.2 68.5 73.0 58.9 63.8	$\begin{array}{c} \text{s. d.} \\ 5 & 0 \\ 6 & 0 \\ 6 & 0 \\ 6 & 2 \\ 4 & 7 \\ 5 & 8 \\ 4 & 6 \\ 4 & 6 \\ 6 & 0 \\ 6 & 0 \\ 6 & 0 \\ \end{array}$	$\begin{array}{c} \text{s. d.} \\ 2 & 0\frac{1}{3} \\ 3 & 2 \\ 3 & 6\frac{1}{4} \\ 3 & 3\frac{1}{4} \\ 3 & 10\frac{1}{3} \\ 3 & 10 \\ 3 & 10\frac{1}{4} \end{array}$	$\begin{array}{c} s \ d. \\ 2 \ 3\frac{1}{4} \\ 2 \ 10 \\ 3 \ 0\frac{1}{4} \\ 1 \ 10 \\ 1 \ 10 \\ 1 \ 3 \\ 2 \ 8 \\ 2 \ 2 \\ \end{array}$	

The number of passengers carried on the Victorian lines is greatly in excess of that of New South Wales, due in a large measure to the complete suburban system prevailing in the former colony, which places the principal suburbs in direct communication with the metropolis.

The following table shows the number of passengers carried on the Government lines of each of the Colonies in 1881, in 1891–92, and 1892–93, and are quoted from the official returns of the various Railway Departments :--

Galana	Passengers carried.						
Colony.	1881.	1891-92.	1892-93.				
New South Wales Victoria Queensland South Australia Western Australia Tasmania New Zealand	number. 6,907,312 18,973,070 247,284 3,032,714 67,144 102,495 2,911,477	$\begin{array}{c} \text{number.}\\ 19,918,916\\ 69,546,921\\ 2,370,219\\ 5,749,028\\ 508,304\\ 725,724\\ 3,555,764 \end{array}$	number. 19,932,703 58,445,075 2,247,029 5,744,487 464,348 704,531 3,759,044				
Australasia	32,241,496	102,374,876	91,297,217				

The Queensland and New Zealand returns do not include passengers with season tickets.

The amount of goods tonnage is shown in the subjoined table. In the period from 1881 to 1891 there was an increase of about 156 per cent., varying from 71 per cent. in South Australia to 377 per cent. in Queensland. The tonnage for 1892-3 shows on the whole a slight decrease upon the figures for the previous year :---

Colony.	1881.	1891-2.	1892-3.
New South Wales	tons. 2,033,850	tons. 4,296,713	tons. 3,623,728
Victoria	1,249,049	3,431,578	3,386,888
Queensland	161,009	768,527	762,938
South Australia	646,625	1,106,839	1,337,859
Western Australia	27,816	94,476	138,910
Tasmania	44,396	161,141	178,224
New Zealand	523,099	2,122,987	2,193,330
Australasia	4,685,844	11,982,261	11,621,877

The percentage of receipts from coaching traffic to the total receipts is about the same in the Australasian Colonies as in Europe. The proportion in the United Kingdom for 1892 was 43.44 per cent. for coaching traffic to 52.22 per cent. for goods traffic, besides which there was 4.34 per cent for miscellaneous receipts, which could not properly be classed under either of the above heads; so that the proportion of receipts from coaching traffic to goods traffic was 45.41 per cent. against 54.59 per cent. The figures for the various colonies are given below :—

Colony.	Coaching Traffic.	Goods Traffic.
New South Wales	per cent. 38·1	per cent. 61.9
Victoria	51.5	48.5
Queensland	22.3	77.7
South Australia	30.0	70.0
Western Australia	36.8	63.2
Tasmania	49.5	50.5
New Zealand	36.9	63.1
Australasia	38.9	61.1

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The following table gives the different classes of rolling-stock in the possession of the several Australasian Governments during 1892–93; and, considerable as are the numbers of each class, they could with advantage be largely increased :---

Colony.	Locomotives.	Passenger Carriages.	Goods Waggons.
New South Wales	515	1,053	10,551
Victoria	499	1,107	8,530
Queensland	273	329	3,906
South Australia	247	326	5,620
Western Australia	28	53	442
Tasmania	62	172	1,034
New Zealand	269	491	8,357
Australasia	1,893	3,531	38,440

RAILWAY ACCIDENTS.

The persons meeting with accidents on railway lines may be grouped under three heads—passengers, servants of the railways, and trespassers; and the accidents themselves may be classified into those arising from causes beyond the control of the person injured, and those due to misconduct or want of caution. Adopting this classification, the accidents during 1892–93 in those colonies for which returns are available are enumerated below :—

Colony	Passengers.		Railway Employés.		Trespassers, &c.		Total.	
Colony.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
New South Wales	7	47	10	87	11	5	28	139
Victoria		· 134	6	144	23	48	29	326
South Australia	1		7	31	3	8	11	39
Tasmania				20	1	1	1	21
New Zealand	3	9	2	120	5	41	10	170

The railways of Australasia have been as free from accidents of a serious character as the lines of most other countries. In order to obtain a common basis of comparison it is usual to find the proportion which the number of persons killed or injured bears to the total passengers carried. There is, however, no necessary connection between the two, for it is obvious that accidents may occur on lines chiefly devoted to goods traffic; and a more reasonable basis would be the accidents to passengers only compared with the number of passengers carried. The data from which such a comparison could be made are wanting for some countries; as far as the figures can be given they are shown in the following table, which exhibits the number of passengers killed and injured per million passengers carried. The figures are calculated over a series of years and brought down to the latest available dates :---

Country.	Number of	Number o	of Passengers.	Average per million passengers carried.	
	Years.	Killed.	Injured.	Killed.	Injured.
Germany Austria-Hungary Belgium Sweden France Italy Norway Holland Switzerland Russia United Kingdom Portugal Spain Canada New South Wales	6 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	$ 187 \\ . 50 \\ 55 \\ 9 \\ 262 \\ 45 \\ 2 \\ 6 \\ 33 \\ 181 \\ 350 \\ 6 \\ 113 \\ 92 \\ 68 $	781 403 463 9 1,309 395 1 17 109 544 4,321 66 477 397 433	$\begin{array}{ c c c c c } 0.1 & 0.1 & 0.1 & 0.1 & 0.1 & 0.2 & 0.2 & 0.2 & 0.2 & 0.2 & 0.2 & 0.1 & 0.1 & 0.1 & 0.2 & 0.3 & 0.2 & 0.4 & 0.9 & 0.3 & 0.2 & 0.4 & 0.9 & 1.3 & 0.4 & 0$	$\begin{array}{c c} 0.4 \\ 1.1 \\ 1.2 \\ 0.2 \\ 1.1 \\ 1.8 \\ 0.1 \\ 0.2 \\ 0.7 \\ 2.5 \\ 1.8 \\ 4.1 \\ 3.8 \\ 5.5 \\ 2.5 \end{array}$
Victoria	10 ² / ₂	32	1,168	0.1	1.8

TRAMWAYS.

In all the Australasian Colonies tramways are in operation, but it is chiefly in Sydney and Melbourne, the inhabitants of which numbered at the latest date 421,030 and 444,832 respectively, that the density of settlement has necessitated the general adoption of this mode of transit. In New South Wales steam-motors are mostly used, though there is a length of $1\frac{1}{2}$ miles of cable tram at North Shore, and another cable-line is being constructed from King-street, Sydney, to Ocean-street, Woollahra. The length of Government tram-lines open on the 30th June, 1893, was 49 miles, which had cost for construction the sum of £1,118,471. The receipts for the year ended on the same date were £295,367, and the working expenses £233,808, leaving a profit of £61,559, or 5.51 per cent. In Victoria the cable system is in operation in the metropolitan area, the lines having been constructed by a municipal trust at a cost of £1,671,966. The tramways are leased to a company, and the receipts for the year ending 31st December, 1893, were £375,192. The number of passengers carried during the year was 35,096,240. In addition to these lines, there are over 20 miles of horse tramway in Victoria.

In Queensland there is a system of horse trams, controlled by a private company. The liabilities at the 30th September, 1892, were £152,379, and the assets £147,164; the receipts for the year ending in the same date were £31,189, and the expenses £35,048. The number of horses owned by the company was 387, and cars 51. There were 2,564,304 passengers carried during the year.

In South Australia there are no Government tramways, but horse trams are run in the principal streets of Adelaide by private companies. No particulars have been collected respecting the length of these lines, nor of the returns therefrom.

The Western Australian Government owns a line of horse tramway on a 2-ft. gauge between Roeburne and Cossack, a length of 8 miles.

In Tasmania a private company maintains a line of horse tramway, 11 miles in length, between Don and Barrington, on the north-west coast. The cost was $\pounds 9,926$, the receipts in 1891 came to $\pounds 1,169$, and the expenditure $\pounds 1,194$. Passengers are carried free of charge on this line. The average number of horses employed was 10 and vehicles 9.

There are also trainways in existence in New Zealand under private management, but no particulars are at present available.