RAILWAYS.

TO the proper development of a country like Australasia, ill-supplied with navigable rivers, railway construction is absolutely essential. This has been recognised from an early period, and for the last forty years the Governments of the principal colonies have been fully alive to the importance of carrying on the work. For a long time, however, they were hampered in their efforts by the difficulty of borrowing money in London at a reasonable rate of interest; but since the year 1871 considerable progress has been made in the work of construction; indeed, by far the greater portion of the public debt of Australasia has been contracted for railway purposes. As the area of the seven colonies almost equals that of Europe or the United States of America, while the population numbers less than four and a quarter millions, it is almost needless to say that many of the lines run through districts very sparsely peopled. This is particularly the case in the colonies of 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. Indeed, if a fault may be found with the Governmental policy pursued in some of the provinces, it is that in some cases expensive lines have been laid down in empty country the requirements of which could have been effectually met for many years to come by light and cheap lines, and that in consequence the railway administrators find themselves heavily burdened with a number of unprofitable lines which, as the less of two evils, they must continue to work at a loss. Notwithstanding these drawbacks, however, the railways of Australasia collectively yield a net return equal to 2·98 per cent. on the cost of construction.

History of Railway Construction.

An agitation for the introduction of the railway into the colony of New South Wales was in existence as far back as 1846, and in August of that year it was decided at a public meeting held in Sydney to survey a line to connect the capital with Goulburn. But no decided step was taken towards the construction of the railway until September, 1848, when the Sydney Railroad and Tramway Company was formed for the purpose of laying down a line between Sydney and Parramatta and Liverpool, to be afterwards extended to Bathurst and to Goulburn. The first sod was turned by the Hon. Mrs. Keith Stewart, daughter of Sir Charles Fitzroy, the Governor of the colony, on the 3rd July, 1850. Although started during a period of trade depression, when there was an abundant supply of labour, the scheme was only well under weigh when the discovery of gold caused a stampede from the city, and the company was left without workmen to carry on the undertaking. Undeterred, however, by the difficulties into which the changing conditions of the country had plunged the Sydney Railroad and Tramway Company, private enterprise in 1853 essayed the further task of constructing a line between Newcastle and Maitland; but this project proved no more successful than the other, and in the following year the Government was forced to step in and carry out the schemes for which the two companies had been promoted. From that time the work of construction was vigorously pressed forward, and on the 26th September, 1855, the line from Sydney to Parramatta, 14 miles in length, was opened to traffic; and on the 11th April, 1857, Newcastle was connected with East Maitland. The extension to Goulburn of the Sydney line was completed on the 27th May, 1869.

While the Sydney Railroad and Tramway Company were trying to surmount the obstacles that had arisen in their path, the work of railway construction was begun in the neighbouring colony of Victoria, no fewer than three private companies being promoted in 1853 for that purpose. Material assistance in the shape of land grants and guarantee of interest was afforded by the Government; and on the 13th September, 1854, the first completed railway in Australasia, a line extending from Flinders-street, Melbourne, to Port Melbourne, was opened to traffic. It had been begun nearly three years after the line to connect Sydney with Parramatta, but was only $2\frac{1}{2}$ miles long. No further mileage was brought into operation until May 13, 1857, when the Melbourne and Hobson's Bay Railway Company, who had constructed the first line, effected communication with St. Kilda; and on the 17th June of the same year a line from Williamstown to Geelong, 39 miles in length, which had been built by another company, was declared open. Meanwhile the Government of the colony had not remained inactive. Besides assisting private enterprise with liberal concessions, it had taken over in 1855 an unfinished line started by the third of the companies referred

to, and was carrying on the work of construction on its own account. By the year 1863 it had acquired all the lines in the colony with the exception of those owned by the Melbourne and Hobson's Bay Company, which were not purchased until the year 1878.

Although a line from Goolwa to Port Elliot, 6 miles in length, over which the locomotive now passes, was opened on the 18th May, 1854, it was at that time merely a horse tramway; and the first railway in South Australia was a line connecting the city with Port Adelaide, 7½ miles long, which was thrown open to traffic on the 21st April, 1856. The following year saw the railway extended as far north as Gawler. New Zealand was the next of the Australasian colonies to make the introduction. As the result of an agitation on the part of the settlers of Canterbury, a railway was begun during the year 1863 for the purpose of connecting the city of Christchurch with the port of Lyttelton, and the first portion was brought into use on the 1st December, 1863. The northern colony of Queensland had enjoyed the privilege of self-government for several years when, early in 1864, a line to connect Ipswich with Grandchester was commenced, and on the 31st July of the same year it was opened. Although the Tasmanian Parliament granted a sum of £5,000 in 1863 for the survey of a line to connect Hobart with Launceston, the first railway in the island was one between Launceston and Deloraine, 45 miles in length, which was opened on the 10th February, 1871, having been commenced three years before. It was built by a private company, to whose capital, however, the Government had subscribed eight-ninths of the total amount of £450,000, on condition that the interest should be a first charge on the net receipts, and on the 3rd August, 1872, the line passed entirely into the ownership of the State. Communication between Hobart and Launceston was effected in 1876 by the completion of a line, connecting the southern city with Evandale Junction, which was constructed by an English company. The last of the seven colonies to introduce the railway was Western Australia, where a line from the port of Geraldton to Northampton was begun during 1874 and opened in 1878; while on the 1st October, 1889, a line from Palmerston to Pine Creek, in the Northern Territory, which had been built by the South Australian Government, was opened, the length being 145½ miles.

The progress of railway construction, except, perhaps, in the colony 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 natural fear that the return would not justify the expenditure which would have to be incurred in making wide extensions of the lines. It was also due, as previously pointed out, 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; but since the year 1871 all the colonies have made satisfactory progress. In the following table will be found the length of line

opened during each year, and the total mileage at the close of the working year:—

Year.	Miles opened.		Year.	Miles opened.	
	Total.	During each year.		Total.	During each year.
1854	2½	2½	1875	2,144	444
1855	16½	14	1876	2,679	535
1856	32½	16	1877	3,447	768
1857	117	84½	1878	3,976	529
1858	132	15	1879	4,393	417
1859	171	39	1880	4,933	540
1860	215	44	1881	5,526	593
1861	243	28	1882	6,169	643
1862	373	130	1883	6,587	418
1863	400	27	1884	7,425	838
1864	474	74	1885	7,881	456
1865	495	21	1886	8,669	788
1866	524	29	1887	9,498	829
1867	718	194	1888	10,230	732
1868	789	71	1889	11,074	844
1869	918	129	1890	11,713	639
1870	1,040	122	1891	12,174	461
1871	1,135	95	1892	12,405	231
1872	1,273	138	1893	12,779	374
1873	1,498	225	1894	13,125	346
1874	1,700	202	1895	13,773	648

It will be seen from the above table that the lines opened in Australasia averaged 30 miles in length during each year from 1854 to 1861; from 1862 to 1871 the annual average was 89 miles; from 1872 to 1881, 439 miles; and from 1882 to 1895, 825 miles. It is now the established policy of each colony to keep the railways under State control, and only in exceptional circumstances is that policy departed from. Excluding coal and other lines which are not open to general traffic, there are in Australasia only 907 miles of private lines, or but 6·6 per cent. of the total mileage open. In Victoria and Queensland the railways are entirely in the hands of the Government; while in Western Australia there are 572 miles of private lines, or exactly 50 per cent. of the total mileage of the colony; in New Zealand, 175 miles; in New South Wales, 85 miles; in Tasmania, 55 miles, of which 7 (the Dundas-Zeehan line) are worked by the State; and in South Australia, 20 miles. The divergence of the policy of Western Australia from that pursued by the other colonies was caused by the inability of the Government to construct lines when the extension of the railway was urgently required in the interests of settlement. Private enterprise was therefore encouraged by liberal grants of land to undertake the work of construction; but the changing conditions of the colony must modify the State policy, and there cannot be much doubt that in the near future the Government will make some effort to

acquire the two trunk lines at present in private hands. These are the Midland and Great Southern Railways, 277 miles and 243 miles in length respectively. The State concession to the promoters of these lines consisted of 12,000 acres of land for every mile of railway laid down, or, according to the mileage, nearly 6¼ million acres of land. The following statement shows the gauge and length of the private railways of Australasia :—

Line.	Gauge.	Length.
	ft. in.	miles.
New South Wales—		
Deniliquin-Moama	5 3	45
Cockburn-Broken Hill	3 6	36
Clyde-Rosehill	4 8½	3
Warwick Farm	4 8½	1
South Australia—		
Glenelg Railway Co.'s lines :		
Holdfast Bay	5 3	7
Victoria Square	5 3	7
Sidings, loops, &c.	5 3	6
Western Australia—		
Midland : Midland Junction-Walkaway Junction	3 6	277
Great Southern : Beverley-Albany	3 6	243
Darling Range-Guildford	3 6	20
Do -Rockingham	3 6	20
Albany-Torbay	3 6	12
Tasmania—		
Emu Bay-Waratah	3 6	48
Dundas-Zeehan	3 6	7
New Zealand—		
Wellington-Manawatu	3 6	84
Kaitangata-Stirling	3 6	4
Midland Railway	3 6	87

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.

In the construction of railways during the last working year the colony of Western Australia displayed most activity, in consequence of the urgent need of laying down lines to the goldfields of Yilgarn, Coolgardie, and Murchison. Of the 648 miles thrown open to traffic in Australasia during the twelve months, 402 miles were opened in Western Australia, 254 being built by the Government and 148 by private companies. The most important addition to the system of the colony was the line from Northam to Southern Cross, 170 miles in

length, which was opened on the 1st July, 1894. An extension of the same railway to Coolgardie, a further distance of 115 miles, was opened with great ceremony on the 23rd March, 1896; and it is proposed to take the line on to Kalgoorlie, 25 miles beyond Coolgardie. Another important addition to the Government railways during the working year ended June, 1895, was the extension of the line from Mullewa to Cue, in the centre of the Murchison gold-fields, a distance of 57 miles. The 148 miles of private line brought into operation were the remainder of the Midland Railway, owned by a London corporation, the completed line measuring 277 miles in length, and costing in its construction about one million sterling, the Government concession being over 3¼ million acres of land along the route. The extension of and additions to the Victorian lines amounted to 100 miles, which were very cheaply constructed on the butty-gang system, fencing, gates, and cattle-pits being dispensed with wherever possible. The following table shows the extension of the railway in each colony since 1861 :—

Colony.	1861.	1866.	1871.	1876.	1881.	1886.	1891-92.	1894-95.
New South Wales	73	143	358	554	1,040	1,941	2,266	2,616
Victoria	114	275	276	718	1,247	1,754	2,903	3,103
Queensland	*	50	218	298	800	1,433	2,320	2,379
South Australia	56	56	133	308	845	1,226	1,823	1,887
Western Australia.....	*	*	*	38	92	202	657	1,145
Tasmania	*	*	45	45	168	303	425	475
New Zealand	*	*	105	718	1,334	1,810	2,011	2,168
Australasia	243	524	1,135	2,679	5,526	8,669	12,405	13,773

* Railways not in existence.

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 of Queensland was completed, thus placing the four capitals, Brisbane, Sydney, Melbourne, and Adelaide, in direct communication with each other. A few years ago proposals were 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 was proposed to extend the lines to Eucla, close to the South Australian Border, and when that colony had extended its railways to the same point, Perth would be connected with all the capitals of the Australian colonies. These proposals, however, fell through, but when such a scheme shall have been carried out, as it will possibly be at no far distant date, although probably not by a private company, the European mails will, in all likelihood, be landed at Fremantle, and sent overland to all parts of the continent.

The following table shows the length of Government railways under construction on the 30th June, 1895 :—

	Miles.		Miles.
New South Wales.....	63	New Zealand.....	127
Victoria	26		
Queensland.....	7	Total.....	338
Western Australia.....	115		

Notwithstanding the energetic expansion of the railway systems throughout Australasia since 1871, there is still room for considerable extension. In the colony of South Australia 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 the proposal has not been accepted. In New South Wales the railway extensions will be chiefly confined to perfecting the various systems already constructed. At the present time several lines of what is termed the "pioneer" class are in course of construction in level pastoral country. These are of a light and cheap kind, on which the produce of the settlers may be conveyed to the parent lines at a reasonable speed and at a cheaper rate than carriage by road. 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 Southern, 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. In Western Australia great activity now prevails in extending the lines to the gold-fields, and also in the south-western portion of the colony in the interests of permanent settlement.

Control of State Railways.

The colonies of Victoria, South Australia, 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 made the change, while New South Wales and Queensland followed in 1888. Each of these colonies appointed three officials as Commissioners, and 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. Queensland, Victoria, and South Australia, however, have now reduced the number of Commissioners to one. In New South Wales the administration by the Commissioners has been most successful, and no changes have been made. The control of the New Zealand railways was also handed over to a body of three Commissioners in 1887; but on the 1st January, 1895, the Government resumed charge of the lines.

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.

Diversity of Gauge.

Unfortunately for intercolonial railway communication, no agreement was carried out between the colonies as to the adoption of a uniform gauge. As far back as 1846 the 4-ft. 8½-in. gauge was recommended by Mr. Gladstone for any railways 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 Railroad and Tramway 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 Railroad and Tramway Company, having changed their engineer, altered their views with regard to the question of gauge; they applied to have the 4-ft. 8½-in. gauge substituted for the 5-ft. 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, with 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 513 miles laid to the 5-ft. 3-in. gauge, and 1,229 to that of 3-ft. 6-in., which is also the gauge of the 145 miles of railway in the Northern Territory. The line joining Adelaide with the Victorian border, as well as several of the other trunk-lines, has 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 uniformity of gauge is desirable, and every year in which action is delayed makes 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 3,661 miles; there are 2,535 miles on the 4-ft. 8½-in. gauge, and 7,577 miles on the 3-ft. 6-in. gauge.

As far back as May, 1889, the Chief Commissioner for New South Wales railways brought the desirability of taking action with the object of securing a uniform gauge for the colonies under the notice of the Minister of the day, and quite recently the Commissioners have again directed attention to the urgency of dealing with this important question before the colonies incur greater expenditure in railway construction. They suggest that the settlement of the difficult question of the adoption of a standard gauge should be approached from the standpoint of which of the two gauges, 4 ft. 8½ in. and 5 ft. 3 in., can be adopted at the least cost and with the smallest amount of inconvenience to the country; and that the whole of the railways of New South Wales and Victoria, with that part of the South Australian lines laid to the 5-ft. 3-in. gauge, as well as the line to Cockburn, and all the lines in Queensland south of Brisbane leading to New South Wales, shall be altered to the standard, the cost of altering the railways and the rolling stock necessary to work them to be a national charge.

Comparison of Railway Facilities.

The population and area of territory per mile of line open vary considerably in the different colonies. As regards population per mile of line open, Western Australia, South Australia, and Queensland—the most extensive colonies—show most favourably; but in proportion

to the area of territory, Victoria, New Zealand, and Tasmania take the lead. The annexed table shows the relation of the railway mileage to population and to the area of each colony for the year 1894–95 :—

Colony.	Per mile of line open.	
	Population.	Area
	No.	sq. miles.
New South Wales	485	119
Victoria	381	28
Queensland	191	281
South Australia*	187	479
Western Australia	78	852
Tasmania	332	56
New Zealand	317	48
Australasia	305	223

* Including Northern Territory.

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.	Per Mile of Line Open	
		Population.	Area.
	miles.	No.	sq. miles
United Kingdom	20,908	1,863	6
France	21,952	1,747	9
Germany	26,646	1,855	8
Austria-Hungary	27,678	1,494	9
Belgium	2,811	2,159	4
Netherlands	1,837	2,456	7
Switzerland	2,165	1,350	7
Sweden and Norway	6,424	1,062	46
Spain	6,070	2,890	32
Italy	7,983	3,849	14
India	18,782	11,776	51
Canada	15,768	307	210
Cape Colony	2,441	701	103
Argentine Republic	8,353	542	134
Brazil	7,027	2,048	458
Chili	1,735	1,457	168
Mexico	7,119	1,685	108
United States of America	177,442	357	17
Australasia	13,773	305	223

Cost of Construction.

Below will be found the cost of construction and equipment of the State railways of Australasia. It will be seen that the lines which have been constructed most cheaply are those of Western Australia, where the average cost per mile has only been £3,804, as compared with an average of £9,786 for the whole of Australasia. In that colony there have been few engineering difficulties to contend with, and the lines laid down have been of such a light kind that within the last few years it has been found necessary to relay the Eastern Railway with heavier rails and equip it with more powerful locomotives, as the haulage power was found to be insufficient for reasonably heavy trains. In the colonies of New South Wales and Victoria the cost of construction has been greatest, averaging £14,461 and £12,221 per mile respectively :—

Colony.	Length of line open.	Gauge.	Total cost of Construction and Equipment.	Average cost per mile.
	miles.	ft. in.	£	£
New South Wales ...	2,531¼	4 8½	36,611,366	14,461
Victoria	3,103	5 3	37,922,207	12,221
Queensland	2,379	3 6	16,522,293	6,945
South Australia	1,722	5 3 3 6	12,520,378	7,271
Northern Territory..	145½	3 6	1,145,567	7,873
Western Australia ...	550	3 6	2,092,372	3,804
Tasmania	419¾	3 6	3,518,595	8,383
New Zealand	1,993	3 6	15,352,613	7,703
Australasia	12,843½	.....	125,685,391	9,786

For all the Australian colonies the figures given are those for the working year ended 30th June, 1895. In New Zealand and Tasmania the accounts are closed at different dates, and the figures refer to the twelve months ended 31st March, 1895, and 31st December, 1894, respectively. It should also be noted that in the case of Western Australia the mileage given is the average length of lines worked during the year, and the cost of construction the sum spent on the average mileage worked and not on the total mileage open on the 30th June, 1895, which was 573.

It would hardly be fair to institute a comparison 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 as follows :—

Canada	£11,732
Cape Colony	9,009
United States	11,343
Argentina	9,702
Mexico	9,417
Chili	6,358
Brazil	8,104

while for Australasia it is £9,786.

Revenue and Working Expenses.

Every colony shows a surplus of revenue over working expenditure, notwithstanding that the avowed object of railway construction in Australasia 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, and some of the colonies have, with more or less success, handed the lines over to Commissioners to be worked according to commercial principles, free from political interference.

The gross and net revenue for the year 1894–5, with the working expenses, were as follow :—

Colony.	Gross Revenue.	Working Expenses.	Net Revenue.
	£	£	£
New South Wales	2,878,204	1,567,589	1,310,615
Victoria	2,581,591	1,543,393	1,038,198
Queensland	1,025,512	581,973	443,539
South Australia	960,155	568,973	391,182
Northern Territory	14,722	11,477	3,245
Western Australia	296,000	182,046	113,954
Tasmania	144,487	122,850	21,637
New Zealand	1,150,851	732,160	418,691
Australasia	9,051,522	5,310,461	3,741,061

During the year 1894–5 the gross earnings of the State railways of Australasia increased by £74,735, and the working expenses were reduced by £71,998, so that the net revenue showed an addition of £146,733, which was an improvement on the results obtained during

the previous twelve months even when allowance is made for the fact that the capital invested in open lines was increased by £2,545,935 in the course of the working year. The colonies which made the greatest progress were New South Wales, Queensland, and Western Australia, where the gross earnings increased by £64,663, £69,765, and £155,436 respectively. In the first two colonies there was a large reduction in the working expenses as well as increased earnings, the addition to the net revenue derived from the working of the lines being £88,916 in New South Wales and £86,195 in Queensland. In Western Australia, on the other hand, there was, as could only be expected in face of the large addition to the mileage open for traffic, an increase in working expenditure, leaving the extra net earnings at £77,363. While the management of the New South Wales railways has been most satisfactory since the Commissioners took office, and steady progress has been made towards making the lines self-supporting, the development of the goldfields in Western Australia has achieved even better results for the railways of that colony, for while working expenses actually exceeded the gross earnings by £6,527 in the year 1890, in 1894–5 Western Australia was the only colony whose railways gave a surplus after defraying interest on the invested capital. In Tasmania there was also an addition to the net revenue, but this result was attained by a reduction in the working expenditure to the extent of £13,618 in face of a diminution of £7,596 in the amount of gross earnings. In all the other colonies—Victoria, New Zealand, and South Australia, both in the colony proper and in the Northern Territory—a backward movement was evinced. The position occupied by Victoria is the most remarkable, the earnings from the passenger traffic having dropped 25 per cent. during the last four years, and the earnings from the carriage of goods 17 per cent. During the last working year the falling-off in the gross revenue was no less than £144,568, but a reduction of £92,026 in the working expenses left the decrease at £52,542. In New Zealand and South Australia a saving was also effected in the expenditure, and the decline in the net revenue was £18,743 and £38,933 respectively. The decision of Parliament that white labour only should be employed on the Palmerston-Pine Creek line in the Northern Territory somewhat increased the working expenses, and, with diminished earnings, caused a reduction of £1,545 in the amount available to meet interest charges.

The following table shows the proportion of working expenses to gross revenue for each colony in 1894–5. In two colonies—New South Wales and Queensland—the proportion of working expenses to gross revenue was below the average for Australasia. Victoria and South Australia were a trifle over the average; Western Australia and New Zealand were high; and Tasmania and the Northern Territory of South Australia were largely in excess of the average. The best position for the year was occupied by New South Wales, where 45·54 of the total takings remained to the good after the working expenses were paid;

while in Tasmania over £85 out of every £100 received went to defray the cost of working the lines. In the colonies of New South Wales, Victoria, Queensland, and Western Australia the proportion of receipts absorbed in working expenses has been steadily reduced during the last five years; in New Zealand the percentage was higher in 1894–5 than in any of the previous four years; while in Tasmania and South Australia the figures have fluctuated greatly, the proportion in the former colony in 1894 being less than in 1893, 1892, and 1891, but much higher than in 1890, and in the latter colony lower in 1894–5 than in 1892–3, but higher than in 1893–4 and other years.

Colony.	Percentage of Working Expenses to Gross Earnings.
New South Wales	54·46
Victoria	59·78
Queensland	56·74
South Australia	59·26
Northern Territory	77·96
Western Australia	61·50
Tasmania	85·02
New Zealand	63·62
Australasia	58·67

Interest returned on Capital.

The average interest payable on the capital expended on railway construction by the Governments of the Australasian colonies is 3·90 per cent., and the return yielded by the lines is 2·98 per cent., showing a loss in working of 0·92 per cent., equivalent to £1,154,800. It will be seen from the table given below that the only colony which has a surplus after paying interest on the invested capital is Western Australia, although in New South Wales the loss is but slight, and is gradually diminishing. In the case of Western Australia, however, it must be pointed out that the Government have raised the tariff on the lines leading to the gold-fields with the avowed object of making the additional charges pay for the cost of construction by the time the gold deposits are worked out, and it may reasonably be claimed that these extra earnings should be placed to a separate account. If this were done, it would probably be found that the net earnings during the year 1894–5 did not quite reach 4 per cent. on the capital expenditure, so that there was a slight deficit instead of an actual gain. The railways in New Zealand, on the other hand, are not credited with the cost of some State services which are estimated at £38,500 for the year, so

that inclusive of this traffic the lines of that colony returned 2·99 instead of 2·73 per cent. on the cost of construction.

Colony.	Interest returned on Capital.	Average Interest payable on Capital Expenditure.	Average Loss.
	per cent.	per cent.	per cent.
New South Wales	3·60	3·79	0·19
Victoria	2·74	3·92	1·18
Queensland	2·68	3·91	1·23
South Australia	3·12	4·01	0·89
Northern Territory	0·28	3·94	3·66
Western Australia	5·44	4·09	*1·35
Tasmania	0·61	3·82	3·21
New Zealand	2·73	4·00	1·27
Australasia	2·98	3·90	0·92

* Average gain.

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 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. realised on capital expenditure during the last five years in all the colonies. The lines of New South Wales, Victoria, Queensland, and South Australia are under the control of Commissioners; while those belonging to New Zealand were similarly administered for practically the whole period dealt with, although they have again been brought directly under Government control:—

Colony.	1890-91.	1891-92.	1892-93.	1893-94.	1894-95.
	per cent.	per cent.	per cent.	per cent.	per cent.
New South Wales	3·59	3·58	3·48	3·46	3·60
Victoria	2·72	2·58	2·87	2·89	2·74
Queensland	1·74	2·57	2·37	2·18	2·68
South Australia	5·32	4·78	3·07	3·54	3·12
Northern Territory	0·12	0·31	0·34	0·42	0·28
Western Australia	†0·05	†0·37	‡0·79	3·12	5·44
Tasmania*	0·68	0·68	0·43	0·44	0·61
New Zealand	2·95	2·79	3·05	2·88	2·73

* For years 1890 to 1894. † Calendar years 1891 and 1892.
‡ Six months ended 30th June, 1893.

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 in that colony, with the exception of 4·18 in the year 1886. The decline in the net profits 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, the colonies will before long equalise the difference between net revenue and the interest on capital cost.

Earnings and Expenses per Mile.

The gross earnings, expenditure, and net earnings per average mile open during the last two years were as follow :—

Colony.	Gross Earnings.		Expenditure.		Net Earnings.	
	1893-4.	1894-5.	1893-4.	1894-5.	1893-4.	1894-5.
	£	£	£	£	£	£
New South Wales..	1,159	1,144	656	623	503	521
Victoria.....	914	837	548	501	366	336
Queensland	402	431	252	245	150	186
South Australia ...	601	558	342	331	259	227
Northern Territory	111	101	78	79	33	22
Western Australia.	438	538	324	331	114	207
Tasmania*.....	356	338	319	288	37	50
New Zealand	613	585	384	372	229	213
Australasia...	732	708	439	415	293	293

* 1893 and 1894.

For the whole of Australasia the gross earnings per average mile open during 1894–5 were £24 less than in the previous year, but the working expenses were reduced to a similar extent, leaving the net earnings at £293 for both years. Below will be found a table giving the returns per train mile. In New South Wales, Queensland, Western Australia, and New Zealand there was an increase in the train mileage run during 1894–5 ; in the other colonies there was a decrease. The

reduction in Victoria was 577,854 miles, due to a falling-off in the passenger traffic and to action taken by the management in the interests of economy :—

Colony.	Gross Earnings.		Expenditure.		Net Earnings.	
	1893-4.	1894-5.	1893-4.	1894-5.	1893-4.	1894-5.
	d.	d.	d.	d.	d.	d.
New South Wales..	94·2	91·0	53·3	49·6	40·9	41·4
Victoria	64·5	64·8	38·7	38·7	25·8	26·1
Queensland	64·2	62·8	40·1	35·7	24·1	27·1
South Australia ...	69·1	67·9	39·4	40·2	29·7	27·7
Northern Territory	125·1	115·1	88·1	89·7	37·0	25·4
Western Australia.	52·6	71·2	38·9	43·8	13·7	27·4
Tasmania*	45·6	45·8	40·9	39·0	4·7	6·8
New Zealand.....	90·4	85·7	56·7	54·2	33·7	31·5
Australasia ...	74·4	73·7	44·6	43·2	29·8	30·5

* 1893 and 1894.

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 ; in the Western, at the Clarence station, Blue Mountains, a height of 3,658 feet is attained ; while on the Northern line the highest point, 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.

Financial Results of Foreign Railways.

The interest on capital cost, the proportion of working expenses to the gross revenue, and the returns per train mile for the railways of some of the principal countries of the world are given below. The figures for

the countries other than Australasia refer either to the year 1893 or 1894 :—

Country.	Capital Cost.			Working Expenses: Proportion to Gross Revenue.	Per Train Mile.		
	Total.	Per Mile Open.	Return Per Cent.		Gross Revenue.	Working Expenses.	Net Revenue.
	£	£	p. cent.	per cent.	d.	d.	d.
United Kingdom	985,387,355	47,130	3·77	56·0	60·6	33·9	26·7
France	607,000,000	27,375	3·41	57·1	65·2	37·3	27·9
Germany	542,543,000	20,361	4·56	63·6	73·2	45·6	27·6
Austria-Hungary	315,813,539	18,495	3·52	56·9	66·5	37·8	28·7
Belgium	58,631,479	29,042	4·34	56·3	56·3	31·7	24·6
United States	1,995,521,000	11,343	4·01	70·4	68·0	48·0	20·0
Canada	184,994,800	11,732	1·60	71·1	57·7	40·2	17·5
Cape Colony	13,407,385	8,950	2·72	64·8	90·0	58·4	31·6
Australasia	125,685,391	9,786	2·98	58·7	73·7	43·2	30·5

The figures given above for the Cape Colony are for State lines only, while the cost of construction per mile shown on page 168 is the average of both Government and private railways. For the United States the capital cost includes the capital paid up on the elevated railroads, but the other figures do not take into account the working of these lines.

Coaching and Goods Traffic.

The number of passengers carried on the Victorian lines is greatly overstated, in consequence of the operation of a system of enumeration under which every passenger passing over several sections in the course of the same journey is counted once for each section. It will be seen from the table given below that during the last few years the number of sectional journeys on the Victorian lines has fallen off enormously, but nearly all the colonies have experienced the effects of the diminished spending power of the people :—

Colony.	Passengers carried.		
	1881.	1891-92.	1894-95.
New South Wales	6,907,312	19,918,916	19,725,418
Victoria	18,973,070	69,546,921	40,210,773
Queensland*	247,284	2,370,219	2,054,416
South Australia	3,032,714	5,749,028	5,224,854
Northern Territory	No lines	4,541	2,950
Western Australia	67,144	508,304	1,022,248
Tasmania	102,495	725,724	514,461
New Zealand*	2,911,477	3,555,764	3,905,578

* Exclusive of journeys of season ticket-holders.

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. Since the latter year, however, the tonnage has declined in some of the colonies, notably in Victoria. The figures are appended :—

Colony.	1881.	1891-92.	1894-95.
	tons.	tons.	tons.
New South Wales	2,033,850	4,296,713	3,907,844
Victoria	1,249,049	3,431,578	2,435,837
Queensland	161,009	768,527	900,591
South Australia	646,625	1,106,839	1,000,408
Northern Territory	No lines.	2,633	2,053
Western Australia	27,816	94,476	255,839
Tasmania	44,396	161,141	174,457
New Zealand	523,099	2,122,987	2,048,391
Australasia	4,685,844	11,984,894	10,725,420

The percentage of receipts from coaching traffic to the total receipts is somewhat less in the Australasian colonies than in the United Kingdom, where for the year 1894 the coaching receipts formed 47 per cent. of the total obtained from goods and passenger traffic. The figures for each colony are given below :—

Colony.	Coaching Traffic.	Goods Traffic.
	per cent.	per cent.
New South Wales	35·5	64·5
Victoria	48·8	51·2
Queensland	30·0	70·0
South Australia	28·3	71·7
Northern Territory	27·9	72·1
Western Australia	38·9	61·1
Tasmania	43·7	56·3
New Zealand	37·2	62·8
Australasia	38·4	61·6

Rolling Stock.

The following table gives the different classes of rolling stock in the possession of the several Australasian Governments at the end of the

year 1894–5, and considerable as are the numbers of each class, they could with advantage be largely increased in most of the colonies :—

Colony.	Locomotives.	Passenger Carriages.	Goods Waggons.
New South Wales	523	1,044	10,557
Victoria	516	1,096	9,071
Queensland	276	329	3,827
South Australia	305	353	6,130
Northern Territory	6	7	134
Western Australia	49	75	1,459
Tasmania	62	122	1,088
New Zealand	269	498	8,468
Australasia	2,006	3,524	40,734

During the last working year many locomotives were lying idle in Victoria in consequence of the reduction in the number of trains running. It is admitted that the older carriage stock is somewhat behind the requirements of the present day, but want of funds and the unsettled state of the traffic prevented any additions from being made. Of the 276 locomotives belonging to the Queensland lines, 46 are of low power, and not suitable for general use. This colony has a large number of rolling stock under order, as have also New Zealand and Western Australia. In the last-mentioned province the rolling stock has never been sufficient for the traffic, which has been much incommoded thereby.

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 might be classified into those arising from causes beyond the control of the person injured, and those due to misconduct or want of caution. The following table shows the number of persons killed and injured on the Government railways during 1894–95 in those colonies for which returns are available :—

Colony.	Passengers.		Railway Employés.		Trespassers, &c.		Total.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
New South Wales	16	77	17	70	9	13	42	160
Victoria	2	101	13	133	27	48	42	282
South Australia	...	2	...	16	7	7	7	25
Tasmania*	...	.....	...	.....	...	.....	...	.....
New Zealand	3	9	5	131	4	52	12	192

* No persons killed or injured.

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 Years.	Number of Passengers.		Average per million passengers carried.	
		Killed.	Injured.	Killed.	Injured.
Germany	5	209	903	0·1	0·4
Austria-Hungary.	4	45	435	0·1	1·2
Belgium	5	62	575	0·1	1·3
Sweden	5	7	11	0·1	0·2
France	5	321	1,747	0·2	1·3
Italy	5	62	483	0·3	2·0
Norway	4	.....	2	0·0	0·0
Holland	5	13	39	0·1	0·4
Switzerland	6	137	416	0·7	2·1
Russia	6	177	591	0·7	2·1
United Kingdom.	2	223	2,389	0·1	1·3
Portugal	5	6	66	0·4	4·1
Spain	6	113	477	0·9	3·8
Canada	4	50	264	0·9	5·9
New South Wales	10½	84	522	0·4	2·8
Victoria	10	37	1,282	0·1	2·7

New South Wales Railways, 1895–6.

Principally on account of the drought which prevailed in the colony, and the strike of coal-miners at Newcastle, the revenue derived from the New South Wales railways declined from £2,878,204 in 1894–5 to £2,820,417 during the year ended 30th June, 1896. The working expenses, however, were diminished by £15,701, so that the net receipts showed a fall of £42,086, the total amount available to meet interest charges being £1,268,529, yielding 3·44 per cent. on the capital expenditure of £36,852,194.

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 408,500 and 447,461 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 are 1½ miles of cable tram and 2 miles of electric tram at North Sydney, and another cable-line, 2½ miles in length, from King-street, Sydney, to Ocean-street, in the suburb of Woollahra. The length of Government tram-lines open on the 30th June, 1895, was 61 miles, which had cost for construction the sum of £1,428,518. The receipts for the year ended on the same date were £282,316, and the working expenses £230,993, leaving a profit of £51,323, or 3·59 per cent. on the invested capital.

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 £1,705,794. The tramways are leased to a company, and the receipts for the year ended 31st December, 1895, were £344,783. The number of passengers carried during the year was 33,447,689. In addition to these lines, there are 48 miles of cable, 4 miles of electric, and about 9 miles of horse tramway in Victoria.

In Queensland there is a system of horse trams, controlled by a private company. The liabilities on the 30th September, 1894, were £104,253, and the assets £144,615; the receipts for the year ended at the same date were £25,717, and the expenses £31,596. The number of horses owned by the company was 369, and of cars 51.

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 8½ miles, constructed at a cost of £20,446. For the year ended 30th June, 1895, the gross earnings were £2,251, and the working expenses £1,895, leaving the net receipts at £356, equal to 1·75 per cent. on the capital cost.

In Tasmania there is an electric tramway, about 9 miles in length, owned by a private company. The cost of construction and equipment was £90,000; the average number of hands employed is 75; and the company possesses 20 cars, of which the average number in use is 12. For the year ended 31st December, 1894, the receipts amounted to £14,112, and the working expenses, excluding directors' fees, to £10,826. The passengers carried during the twelve months numbered 1,456,322.

There are also tramways in existence in New Zealand under private management, but no particulars in regard to them are at present available.