

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 states 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 six states and New Zealand almost equals that of Europe or the United States of America, while the population numbers a little over four and a half 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 states 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 states can it be said that the railway lines traverse thickly-settled areas. Indeed, if a fault may be found with the state policy pursued in the past, 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. A few of these have been closed, and the remainder are worked at a loss. Notwithstanding these drawbacks, however, the railways of the Commonwealth of Australia collectively yield a net return equal to 2·51 per cent., and those of Australasia 2·61 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 afoot as early 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 construction 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 was endeavouring to surmount the obstacles that had arisen in its path, the work of railway construction was begun in the neighbouring state 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, which 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 state had not remained inactive. In addition to 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 state 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, $7\frac{1}{2}$ miles long, which was thrown open to traffic on the 21st April, 1856. The following year saw a railway constructed as far north as Gawler; 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 $145\frac{1}{2}$ miles.

The northern state 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 states comprised in the Commonwealth 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. The commencement of railway construction in New Zealand was due to an agitation on the part of the settlers of Canterbury, who were desirous of facilitating communication between the city of Christchurch and the port of Lyttleton. The first portion of the line, as far as Ferrymead Junction, was brought into use on the 1st December, 1863.

The progress of railway construction, except, perhaps, in the state 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 lengthy 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. Since the year 1871, however, all the states and New Zealand 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.					
	Total.			During each year.		
	Common-wealth.	New Zealand.	Australasia.	Common-wealth.	New Zealand	Australasia.
1854	2½	.....	2½	2½	.....	2½
1855	16½	.....	16½	14	.....	14
1856	32½	.....	32½	16	.....	16
1857	117	.....	117	84½	.....	84½
1858	132	.....	132	15	.....	15
1859	171	.....	171	39	.....	39
1860	215	.....	215	44	.....	44

Year.	Miles opened.					
	Total.			During each year.		
	Common-wealth.	New Zealand.	Australasia.	Common-wealth.	New Zealand.	Australasia
1861	243	.....	243	28	.....	28
1862	373	.....	373	130	.....	130
1863	395	5	400	22	5	27
1864	469	5	474	74	.....	74
1865	490	5	495	21	.....	21
1866	519	5	524	29	.....	29
1867	711	7	718	192	2	194
1868	782	7	789	71	.....	71
1869	911	7	918	129	.....	129
1870	994	46	1,040	83	39	122
1871	1,030	105	1,135	36	59	95
1872	1,168	105	1,273	138	.....	138
1873	1,353	145	1,498	185	40	225
1874	1,491	209	1,700	138	64	202
1875	1,602	542	2,144	111	333	444
1876	1,961	718	2,679	359	176	535
1877	2,493	954	3,447	532	236	768
1878	2,906	1,070	3,976	413	116	529
1879	3,222	1,171	4,393	316	101	417
1880	3,675	1,258	4,933	453	87	540
1881	4,192	1,334	5,526	517	76	593
1882	4,704	1,465	6,169	512	131	643
1883	5,107	1,480	6,587	403	15	418
1884	5,855	1,570	7,425	748	99	838
1885	6,227	1,654	7,881	372	84	456
1886	6,859	1,810	8,669	632	156	788
1887	7,657	1,841	9,498	798	31	829
1888	8,365	1,865	10,230	708	24	732
1889	9,162	1,912	11,074	797	47	844
1890	9,757	1,956	11,713	595	44	639
1891	10,163	2,011	12,174	406	55	461
1892	10,394	2,011	12,405	231	.....	231
1893	10,688	2,108	12,796	294	97	391
1894	10,974	2,168	13,142	286	60	346
1895	11,600	2,190	13,790	626	22	648
1896	11,641	2,190	13,831	41	.....	41
1897	11,970	2,185	14,155	329	(-) 5	324
1898	12,170	2,222	14,392	200	37	237
1899	12,702	2,257	14,959	532	35	567
1900	12,995	2,271	15,266	293	14	307
1901	13,497	2,300	15,797	502	29	531
1902	13,821	2,323	16,144	324	23	347
1903	13,730	2,404	16,134	(-) 91	81	(-) 10

It will be seen from the foregoing table that the lines opened in the Commonwealth and Australasia averaged 30 miles in length during each year from 1854 to 1861; from 1862 to 1871 the annual average was 82 miles in the Commonwealth and 89 in Australasia; from 1872 to 1881, 312 miles in the Commonwealth and 439 in Australasia; from 1882 to 1891, 597 miles in the Commonwealth and 665 in Australasia; and from 1892 to 1903, 333 miles in the Commonwealth and 372 in Australasia. It is now the established policy of each state to keep the railways under state control, and only in exceptional circumstances is that policy departed from. Excluding coal, timber, and other lines which are not open to general traffic, there are within the Commonwealth only $640\frac{1}{4}$ miles of private lines, equal to but 4·66 per cent. of the total mileage open; and in Australasia only $728\frac{1}{4}$ miles, or 4·51 per cent. of the total mileage open. In Victoria the railways are entirely in the hands of the Government; while in Western Australia there are 277 miles of private lines, or 15·44 per cent. of the total mileage of the state; in New South Wales, $81\frac{1}{4}$ miles; in Tasmania, 160 miles, and in South Australia, 20 miles. A departure from the ordinary policy of the state has also been made in Queensland, where the construction of the railway from Mareeba to Chillagoe, a distance of 102 miles, has been carried out by private persons. The private lines of New Zealand have a total length of 88 miles. Except in the case of Western Australia, none of these private railways are trunk lines, the most important of them being primarily intended to facilitate the development of important mines, and not for general traffic.

The divergence of the policy of Western Australia from that pursued by the other states was caused by the inability of the Government to construct lines when railway extension 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 state have modified its policy, and on the 1st January, 1897, the Government acquired the Great Southern Railway, 243 miles in length, one of the two trunk lines in private hands. This railway, which was owned by the West Australian Land Company, Limited, was built on the land-grant system, the state concession being 12,000 acres for every mile of line laid down, of which the original concessionaire retained 2,000 acres. The total price paid by the Government for the railway, with all the interests of the company and of the original concessionaire, was £1,100,000, of which £800,000 is set down as the capital sum on which the railway authorities are expected to provide interest, exclusive of the amount invested in rolling stock. The other trunk line is the Midland Railway, 277 miles in length, owned by the Midland Railway Company of Western Australia, Limited. In this case the land granted by the state was also 12,000 acres per mile of line. In 1891 the Government granted some slight assistance to the company, and in the following year guaranteed £500,000 of 4 per cent. debentures, the security being a first charge

upon the railway and its equipment, and 2,400,000 acres selected land. At three months' notice, the state may foreclose should the company be indebted to it to the amount of £20,000.

The following statement shows the gauge and length of the private railways of Australasia, excluding coal, timber, and other lines which are not open to general traffic:—

Line	Gauge.	Length.
	ft. in.	miles.
New South Wales—		
Deniliquin-Moama	5 3	45
Cockburn-Broken Hill.....	3 6	35½
Warwick Farm	4 8½	¾
Queensland—		
Mareeba to Chillagoe	3 6	102
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
Tasmania—		
Emu Bay-Waratah-Guildford Junction- Zeehan	3 6	98
Lyell-Strahan	3 6	22
Gormanston to Kelly's Basin.....	3 6	33
Dundas-Zeehan.....	3 6	7
New Zealand—		
Wellington-Manawatu.....	3 6	84
Kaitangata-Stirling	3 6	4

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 so disposed, acquire the lines at a valuation. Similar conditions are found in most of the charters granted by the other states permitting the construction of private lines.

In the construction of railways during the last working year the state of Western Australia displayed most activity, 156 miles of new line having been opened for traffic during the year. It will be observed, on reference to the following table, that notwithstanding the opening of new lines, the total mileage is less than that shown in the previous year. The decrease is due to the closing in 1902 of several lines which were unable to pay working expenses.

The following table shows the extent of railway mileage in each state since 1861 :—

State.	1861	1866	1871	1876	1881	1886	1891-2	1901-2	1902-3
New South Wales..	73	143	358	554	1,040	1,941	2,266	3,107	3,220
Victoria	114	270	276	718	1,247	1,754	2,903	3,302	3,383
Queensland.....	*	50	218	298	800	1,433	2,320	2,903	2,813
South Australia....	50	56	133	303	845	1,226	1,823	1,901	1,901
Western Australia..	*	*	*	38	92	202	657	1,990	1,793
Tasmania	*	*	45	45	168	303	425	618	620
Commonwealth	243	519	1,030	1,961	4,192	6,859	10,394	13,821	13,730
New Zealand	*	5	105	718	1,334	1,810	2,011	2,323	2,404
Australasia	243	524	1,135	2,679	5,526	8,669	12,405	16,144	16,134

* 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 state 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 state with South Australia. It was proposed to extend the lines to Eucla, close to the South Australian border, and when that state had extended its railways to the same point, Perth would be connected with all the capitals of the Australian states. In June, 1897, the South Australian Railways Commissioner, in a report to the Commissioner of Public Works, estimated the cost of construction and equipment of a line to the Western Australian border, a distance of 553 miles, at £1,903,000. When the railways of the two states shall have been connected, as they will possibly be at no far distant date, 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 in course of construction and authorised on the 30th June, 1903 :—

	Miles.
New South Wales	312
Victoria	127
Queensland	216
South Australia	3
Western Australia	48
Commonwealth	706
New Zealand	194
Australasia.....	900

Notwithstanding the energetic expansion of the railway systems throughout Australasia since 1871, there is still room for considerable extension. In the state 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 eventually to extend this line as far north as Pine Creek, the southern terminus of the Port Darwin line. In the course of the year 1896 offers were made on behalf of various syndicates for the construction of the transcontinental railway, with the acquisition of the section from Palmerston to Pine Creek; but the Government was not prepared to recommend to Parliament the acceptance of any offer based on the land grant or guarantee system. 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.

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 trunk 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. In this state a system has been introduced by which railways are constructed under a guarantee given by the local authority on behalf of the ratepayers of the district. Details of this system are given on a subsequent page. In Victoria, Tasmania, and New Zealand the railways are well developed compared with size of territory, and any future extensions will hardly be on so large a scale as in the other states. Western Australia has accomplished much useful work in the direction of extending the lines to the gold-fields, and also to the south-western portion of the state.

CONTROL OF STATE RAILWAYS.

The states of Victoria, South Australia, New South Wales, Queensland and Western Australia have found it expedient to place the management and maintenance of railways under the control of commissioners. Victoria, in 1883, was the first state to adopt this system; four years later South Australia made the change, while New South Wales and Queensland followed in 1888, and Western Australia in 1902. Each of these states (with the exception of Western Australia,

where there is only one commissioner) appointed three officials as commissioners, and conferred upon them large executive powers, amounting to almost independent control, the object aimed at being to obtain economical management of the lines free from political interference. Subsequently Queensland, Victoria, and South Australia reduced the number of commissioners to one; but in New South Wales, where the administration has been most successful, no changes in the system have been made. On the 1st June, 1903, the control of the railways in Victoria was again vested in three commissioners. The control of the New Zealand railways was also handed over to a body of three commissioners in 1887; but at the beginning of 1895 the Government resumed charge of the lines, a general manager being appointed, responsible to a Minister for Railways.

In New South Wales and Victoria all proposals for new lines are submitted to committees selected from Members of the Houses of Parliament. These committees take evidence regarding the suitability of the route suggested, the probable cost of construction, the financial prospects of the line, and the grades to be adopted; and thereupon advise Parliament to adopt or reject the schemes proposed. This supervision of railway development may be said to have been attended with success, although lines that are not likely to be commercially successful have been recommended by the committee and sanctioned by Parliament.

DIVERSITY OF GAUGE.

Unfortunately for interstate communication, railway construction in Australia has proceeded without uniformity of gauge, and the accomplishment of this work, which it is everywhere admitted must be secured, becomes more formidable to contemplate as the years roll on. In 1846 Mr. Gladstone advised that the 4-ft. 8½-in. gauge should be adopted for any lines constructed in New South Wales; and two years later this gauge was adopted as the standard by the Royal Commission appointed for the purpose of determining a uniform gauge for England and Scotland. In 1850, however, the Sydney Railroad and Tramway Company decided to adopt the 5-ft. 3-in. gauge, and in 1852 an Act was passed which provided that all railways in the state should be laid down to that gauge. But in 1853 the company mentioned, having changed their engineer, altered their views on the gauge question, and applied to have the 4-ft. 8½-in. gauge substituted for the 5-ft. 3-in., succeeding in repealing the Act and in passing another which made the narrower gauge imperative. This step was taken without the concurrence of the other states, and feeling ran very high in Victoria in consequence, as two of the railway companies in that state had already given large orders for rolling-stock on the 5-ft. 3-in. gauge. Until the lines of the two states 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 class 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 state there are 507 miles laid to the 5-ft. 3-in. gauge, and 1,229 $\frac{1}{4}$ to that of 3-ft. 6-in., which is also the gauge of the 145 $\frac{1}{2}$ 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 transshipment is necessary on the boundary between that state and New South Wales. 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. On the west coast of that island an experiment is being made in the construction of a 2-ft. gauge line, at one-fourth the cost of a line laid down to the Tasmanian standard gauge. The advisableness of constructing lines of this class is also being considered in Victoria. The total length of line in Australasia laid down to a gauge of 5 ft. 3 in. is 3,890 $\frac{1}{2}$ miles; there are 3,138 $\frac{1}{2}$ miles on the 4-ft. 8 $\frac{1}{2}$ -in. gauge, and 8,354 $\frac{1}{2}$ miles on the 3-ft. 6-in. gauge.

As far back as May, 1889, Mr. Eddy urged the Government of New South Wales to take action with the object of securing a uniform gauge for the states, and frequently since that date the Railway Commissioners have directed attention to the urgency of dealing with this important question before the states incur greater expenditure in railway construction. They have suggested 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. 8 $\frac{1}{2}$ 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 states and New Zealand. In comparison with population, Western Australia, Queensland, and South Australia—the most extensive states—have the greatest mileage; but in proportion to the area of territory, Victoria, Tasmania, and New Zealand take the lead. The annexed table shows the relation of the railway mileage

to population and to the area of each state and New Zealand for the year 1902-3 :—

State.	Per Mile of Line Open.	
	Population.	Area.
	No.	sq. miles.
New South Wales	437	97
Victoria	356	26
Queensland	183	237
South Australia*	192	475
Western Australia	142	644
Tasmania	283	42
Commonwealth	289	222
New Zealand	336	43
Australasia	296	194

* Including Northern Territory.

In the following table are given the average population and area of territory per mile of line open in the principal countries of the world. 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	22,078	1,900	5.5
France	23,910	1,639	8.6
Germany	30,974	1,820	6.7
Austria-Hungary	22,691	2,001	10.4
Belgium	2,843	2,354	4.0
Netherlands	1,730	3,042	7.3
Switzerland	2,490	1,331	6.4
Sweden	7,023	737	24.5
Norway	1,308	1,712	94.9
Russia (exclusive of Finland)	29,646	3,497	65.8
Spain	8,315	2,239	23.4
Italy	9,852	3,296	11.2
India (inclusive of Native States)	25,373	11,601	69.6
Canada	18,868	285	161.6
Cape Colony	2,994	812	73.9
Argentine Republic	10,300	465	110.2
Brazil	8,718	1,644	25.0
Chili	2,880	1,092	97.2
United States of America	193,787	384	17.9
Commonwealth of Australia	13,730	289	222
Australasia	16,134	296	194

COST OF CONSTRUCTION.

At the close of the year 1902-1903, the cost of construction and equipment of the state railways completed and open to traffic in the Commonwealth was, in round figures, £129,490,000, or 58·7 per cent. of the public debts of the states comprised in the Federation, after deducting sinking funds. The construction and equipment of the railways of Australasia cost £148,572,700, or 54·1 per cent. of the public debt of Australasia, after deducting sinking funds. To what extent the states have contributed to this expenditure will be apparent from the subjoined table, showing the total cost and the average per mile :—

State.	Year.	Length of line open.	Gauge.	Total cost of Construction and Equipment.	Average cost per mile.
		miles.	ft. in.	£	£
New South Wales	1903	3,138½	4 8½	41,654,977	13,272
Victoria	„	3,383½	5 3	40,974,493	12,110
Queensland	„	2,711	3 6	20,302,177	7,488
South Australia	„	1,736½	{ 5 3 } { 3 6 }	13,400,796	7,718
Northern Territory.....	„	145½	3 6	1,175,056	8,080
Western Australia	„	1,516	3 6	8,141,782	5,370
Tasmania	1902	461½	3 6	3,840,747	8,302
Commonwealth .....	.....	13,092½	.....	129,490,028	9,890
New Zealand	1903	2,291	3 6	19,081,735	8,329
Australasia .....	.....	15,383½	.....	148,571,763	9,658

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 £5,370, as compared with an average of £9,890 for the Commonwealth and £9,658 for the whole of Australasia. In that state there have been few engineering difficulties to contend with, and the lines laid down have been of a light kind. In New South Wales, the average cost, given as £13,272, has been somewhat reduced lately, in consequence of the construction of light "Pioneer" lines, built at an expenditure of £2,019 per mile. The Minister for Public Works

has constructed 12, and is constructing 5 new lines by day labour, as the Railway Construction Department has had a somewhat unfortunate experience in regard to claims for extras to contracts, and expensive litigation in resisting such claims. In Victoria the average cost has been reduced from £13,153 to £12,110 since 1891. At that date it was decided to apply the "butty-gang" system to the construction of railways in the state, and to build all new country lines as cheaply as possible, and this principle has been strictly adhered to. Fairly substantial permanent-way has been laid down, with reduced ballast; unless absolutely necessary, fencing and gatehouses have been dispensed with; and only a skeleton equipment for stations and water supplies has been provided. As settlement progresses and traffic is developed, it is intended to raise these lines to the requisite standard of efficiency.

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 states and New Zealand this item of expenditure is not of leading importance. The cost per mile in certain sparsely-settled countries is as follows:—

Canada	£12,067
Cape Colony	10,363
United States	12,810
Argentina.....	10,213
Mexico	9,417
Chili	10,103
Brazil	14,355

while for the Commonwealth of Australia it is £9,890, and for New Zealand £8,329.

REVENUE AND WORKING EXPENSES.

The avowed object of state railway construction in Australasia has been to promote settlement, apart from considerations of the profitable working of the lines; but 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 states have, with more or less success, handed them over to Commissioners to be worked according to commercial principles, free from political interference. With the exception of South Australia, so far as the Palmerston-Pine Creek line in the Northern Territory is

concerned, in all the states the revenue derived from the railway traffic exceeds the working expenses. During 1898-9 the states of New South Wales and Western Australia derived a profit from the working of the lines; and for the year ended 30th June, 1900, the states of South Australia proper and Western Australia were similarly favoured. During 1900-1, the lines of New South Wales and Western Australia, and for the years ended 30th June, 1902 and 1903, those of Western Australia, not only paid working expenses and interest but left a slight margin of profit. Even in New South Wales, where the Commissioners have achieved most commendable results during the term of their administration, there is a fairly large deficiency for the year ended 30th June, 1903, when it is borne in mind that the average price received for the loans of the state is but £96·37 per £100 of stock, and the interest payable is calculated accordingly. The net sum available to meet interest charges during the last two working years will be found in the following table, showing the earnings and working expenses:—

State.	Working year, 1901-1902.			Working year, 1902-1903.		
	Gross Earnings.	Working Expenses.	Net Earnings.	Gross Earnings.	Working Expenses.	Net Earnings.
	£	£	£	£	£	£
New South Wales.....	3,068,686	2,267,369	1,401,317	3,314,893	2,266,299	1,048,594
Victoria	3,367,843	2,166,118	1,201,725	3,046,858	2,082,087	1,014,771
Queensland	1,382,179	992,751	389,428	1,234,230	863,382	370,848
South Australia	1,085,175	689,517	395,658	1,076,612	624,511	452,101
Northern Territory	12,522	34,649	(-) 22,127	11,298	12,812	(-) 1,514
Western Australia	1,521,429	1,256,370	265,059	1,553,485	1,247,873	305,612
Tasmania*	205,791	173,400	32,391	233,210	173,292	59,918
Commonwealth ..	11,243,625	7,580,174	3,663,451	10,470,586	7,220,256	3,250,330
New Zealand†	1,874,586	1,252,237	622,349	1,974,038	1,343,415	630,623
Australasia	13,118,211	8,832,411	4,285,800	12,444,624	8,563,671	3,880,953

* Years ended 31st December, 1901 and 1902.

† Years ended 31st March, 1902 and 1903

(-) Denotes deficiency in amount available to meet working expenses.

The proportion of gross earnings absorbed by working expenses during each of the last five years will be found below :—

State.	Percentage of Gross Earnings absorbed by Working Expenses.				
	1898-9.	1899-1900.	1900-01.	1901-02.	1902-3.
New South Wales	53·75	55·93	57·17	61·80	68·37
Victoria	62·55	62·89	62·17	64·31	66·69
Queensland	57·14	64·78	80·34	71·82	69·95
South Australia	58·33	56·37	58·95	63·54	58·01
Northern Territory	117·73	164·47	182·59	276·70	113·40
Western Australia	70·91	68·40	77·19	82·58	80·33
Tasmania*	79·23	79·10	79·07	84·26	74·31
Commonwealth	59·71	61·46	64·66	67·41	68·96
New Zealand†	63·26	64·80	65·30	66·80	68·05
Australasia	60·18	61·94	64·75	67·33	68·73

* Years ended 31st December, 1898-1902.

† Years ended 31st March, 1899-1903.

It will be seen from this table that the percentage of working expenses for the states comprised in the Commonwealth has increased from 59·71 to 68·96 in the course of the five years; the increase for Australasia as a whole being from 60·18 to 68·73. In each state of the Commonwealth and New Zealand, with the exception of South Australia, Northern Territory and Tasmania, the working expenses have increased during the quinquennial period. In New South Wales, the increase was 14·62 per cent.; in Victoria, 4·14 per cent.; in Queensland, 12·81 per cent.; in Western Australia, 9·42 per cent.; and in New Zealand, 4·79 per cent. While the reduction in South Australia proper was 0·32 per cent.; in the Northern Territory, 4·33 per cent.; and in Tasmania, 4·92 per cent. At the present time the proportion of gross earnings absorbed by working expenses is smallest in South Australia proper, and, setting aside the Northern Territory railway, highest in Western Australia.

The following statement gives an analysis of the working expenses for the year 1903 for all the states except Tasmania, where the figures

refer to the year 1902, distinguishing the expenditure on maintenance, locomotive power, repairs and renewals, traffic expenses, and general charges. The distribution under the various heads is that made by the railway authorities, and, so far as can be seen, like charges have been grouped together in every case. For New South Wales and Victoria the table shows an item "Pensions and Gratuities"; in the other states expenditure under this heading is included with general charges. The item of "Compensation" can be given for all the states with the exception of Queensland, Tasmania, and New Zealand, where it is not separately shown. The important distinction of repairs to carriages and waggons and of maintenance of locomotive power is unfortunately not observed by Western Australia and Tasmania, the manner in which such repairs are carried out precluding the possibility of an exact distribution of the outlay. It is not proposed to enter into a comparison of the various branches of expenditure, since the differences disclosed by the table arise not from exigencies of working, but from the needs of the treasurers of the states, and the freedom of control, or otherwise, allowed to the managers. In a subsequent part of this chapter which deals with the railway systems of the states individually, an analysis is given of the working expenses for ten years.

Expenditure on—	New South Wales.	Victoria.	Queensland.	South Australia (Proper).	North-eastern Territory.	Western Australia.	Tasmania.	New Zealand.
Maintenance—								
Total	£ 486,596	523,253	292,952	139,297	6,981	265,548	58,612	460,398
Per train mile	d. 10·11	12·33	14·21	8·87	55·07	13·82	15·6	20·30
Per mile open	£ 160·4	158·4	105·5	80·0	48·00	185·2	125·2	203·55
Locomotive Power—								
Total	£ 925,584	641,319	270,162	265,343	2,479	642,808	63,791	378,575
Per train mile	d. 19·23	14·96	13·10	16·89	19·56	33·46	16·9	16·69
Per mile open	£ 305·1	192·3	97·2	153·0	17·05	448·3	136·3	167·36
Carriage and Waggon Repairs—								
Total	£ 164,245	133,614	73,513	51,874	972	Included under		105,976
Per train mile	d. 3·41	3·12	3·57	3·30	7·67	Locomotive		4·67
Per mile open	£ 54·1	40·1	25·5	30·0	6·68	Power.		46·85
Traffic Expenses—								
Total	£ 605,210	582,167	207,303	151,738	1,935	312,364	42,416	350,061
Per train mile	d. 12·58	13·58	10·06	9·66	15·26	16·26	11·2	15·88
Per mile open	£ 190·5	174·6	74·6	87·0	13·31	217·7	90·6	159·17
Compensation—								
Total	£ 7,070	10,729	.....	1,663	4	4,808	.....	.....
Per train mile	d. 0·15	0·25	.....	0·10	0·03	0·25	.....	.....
Per mile open	£ 2·4	3·2	.....	1·0	0·03	3·4	.....	.....
Pensions and Gratuities—								
Total	£ 8,126	93,507	.....	.....	.....	.....	.....	.....
Per train mile	d. 0·17	2·18	.....	.....	.....	.....	.....	.....
Per mile open	£ 2·7	28·0	.....	.....	.....	.....	.....	.....
General Charges—								
Total	£ 69,468	42,498	19,452	14,590	441	22,345	8,473	38,405
Per train mile	d. 1·45	0·99	0·94	0·93	3·43	1·16	2·3	1·69
Per mile open	£ 22·8	12·7	7·0	9·0	3·03	15·6	13·1	16·97
Total Expenses—								
Total	£ 2,266,299	2,082,087	863,382	624,511	12,812	1,247,873	173,292	1,343,415
Per train mile	d. 47·10	47·41	41·88	39·75	101·07	64·95	46·0	59·23
Per mile open	£ 747·0	609·3	310·8	360·0	88·10	870·2	370·2	593·00

INTEREST RETURNED ON CAPITAL

In establishing the financial results of the working of the lines, it is the practice of the railway authorities to compare the net returns with the nominal rate of interest payable on the railway loans outstanding, ignoring the fact that many loans were floated below par and that the nominal is not the actual rate of interest. A true comparison, of course, is afforded by taking the rate of interest payable on the actual sum obtained by the state for its outstanding loans. On this basis the only state which shows out advantageously during the year ended 30th June, 1903, was Western Australia, where the lines returned a profit of 0·27 per cent. after defraying interest charges on the capital cost. In New South Wales the receipts were adversely affected by the unfavourable season, and the interest returned only reached 2·52 per cent., while the actual rate payable on outstanding loans was 3·67 per cent., so that there was a deficiency of 1·15 per cent. on the year's transactions. Victoria also experienced the effects of the adverse season, the net receipts being only 2·47 per cent. on the capital cost, while the actual rate of interest on outstanding loans was 3·86 per cent., there being thus a shortage of 1·39 per cent. on the year's working. The receipts of the Queensland lines also suffered, the return being at the rate of 1·48 per cent. on the capital cost, while the interest charge on the loans of the state was equal to 3·92 per cent., the loss on the year's business being therefore 2·44 per cent. In South Australia proper, the net return for the year was equal to 3·08 per cent. on capital cost, and according to the method of comparison above adopted, this represents a loss of 0·66 per cent. for the year. As explained in subsequent pages, the lines in the Northern Territory are handicapped to such an extent that they do not pay even working expenses, the loss on capital cost being at the rate of 0·13 per cent., and this figure added to 4·37, the actual rate of interest payable on outstanding loans gives a deficiency of 4·50 per cent. on the year's transactions. The Tasmanian railway revenue showed a return equal to 1·56 per cent. on the capital cost, an improvement on the figures of previous years, but as the actual rate of interest on loans outstanding was 3·76 per cent., there was a deficiency equal to 2·20 per cent. For New Zealand lines the net revenue for the year was 3·31 per cent. on capital cost. No data exist on which a comparison can be made with actual rate of interest on outstanding loans, but the interest paid on the loans without taking into consideration the price received for the stock was 3·71 per cent., and on this basis the year shows a loss of 0·40 per cent.

The rate of return on capital 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 claimed.

The table given below shows the rate of interest returned on the capital expenditure for each of the last five years, with the sum by which such return falls short of the actual rate of interest payable on cost of construction. In the case of New Zealand, only the nominal loss is shown; the actual loss was somewhat higher:—

State.	1898-9.	1899-1900.	1900-01.	1901-2.	1902-3.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.

INTEREST RETURNED ON CAPITAL EXPENDITURE.

New South Wales	3·83	3·62	3·93	3·45	2·52
Victoria	2·75	2·83	3·14	2·96	2·47
Queensland	3·15	2·67	1·31	1·93	1·48
South Australia	3·42	3·91	3·86	2·98	3·08
Northern Territory	(-)0·22	(-)0·82	(-)0·98	(-)1·99	(-)0·13
Western Australia	4·55	5·81	4·35	3·54	3·75
Tasmania*	1·03	1·12	1·16	0·85	1·56
Commonwealth	3·31	3·25	3·14	2·88	2·51
New Zealand	3·29	3·42	3·48	3·43	3·31
Australasia	3·31	3·27	3·18	2·95	2·61

NET LOSS ON WORKING LINES.

New South Wales	+0·08	0·14	+0·19	0·23	1·15
Victoria	1·08	1·06	0·62	0·76	1·39
Queensland	0·85	1·35	2·67	2·01	2·44
South Australia	0·53	+0·02	0·01	0·83	0·66
Northern Territory	4·17	4·86	5·03	6·36	4·50
Western Australia	+1·01	+2·29	+0·83	+0·07	+0·27
Tasmania*	2·79	2·69	2·62	2·91	2·20
Commonwealth	0·53	0·59	0·65	0·86	1·26
New Zealand	0·52	0·37	0·30	0·33	0·40
Australasia	0·52	0·55	0·60	0·80	1·14

* Years 1898 to 1902.

† Net profit.

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 state, with the exception of 4·18 in the year 1886. The decline in the net profits was largely due to the extension of the lines in sparsely-populated districts; but

with the adoption of a more prudent policy in the matter of construction, rendered necessary by the severe financial pressure to which the states were subjected, and with more careful management, the returns, as will be evident from the foregoing table, are again showing improvement.

EARNINGS AND EXPENSES PER MILE.

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

State.	Gross Earnings.		Expenditure.		Net Earnings.	
	1901-02.	1902-3.	1901-02.	1902-3.	1901-02.	1902-3.
	£	£	£	£	£	£
New South Wales..	1,259	1,093	778	747	481	346
Victoria	1,031	913	663	609	368	304
Queensland	493	444	354	311	139	133
South Australia ...	625	620	397	360	228	260
Northern Territory	86	78	238	88	(—)152	(—) 10
Western Australia.	1,122	1,083	927	870	195	213
Tasmania*	448	498	377	370	71	128
Commonwealth	887	811	598	559	289	252
New Zealand	842	873	562	594	280	279
Australasia...	880	815	592	561	288	254

* 1901 and 1902.

For the states comprised in the Commonwealth the gross earnings per average mile worked during 1902-3 were £76 less than in the the previous year, and the working expenses were less by £39, leaving the net earnings at £252 in 1902-3, as compared with £289 in 1901-2. For the whole of Australasia the gross earnings per average mile worked during 1902-3 were £65 less than in the previous year, and the working expenses were reduced by £31, leaving the net earnings at £254 in 1902-3 as against £288 in 1901-2. On the next page will be found a table giving the returns per train mile. The states of New South Wales, Victoria, Queensland, and South Australia proper,

show a reduction in the train mileage during 1902-3, in comparison with that of the previous year :—

State.	Gross Earnings.		Working Expenses.		Net Earnings.	
	1901-02.	1902-3.	1901-02.	1902-3.	1901-02.	1902-3.
	d.	d.	d.	d.	d.	d.
New South Wales.....	75·58	68·89	46·71	47·10	28·87	21·79
Victoria	71·63	71·09	46·06	47·41	25·57	23·68
Queensland	58·54	59·87	42·05	41·88	16·49	17·99
South Australia	62·06	68·53	39·44	39·75	22·62	28·78
Northern Territory.....	99·26	89·13	274·67	101·07	(-)175·41	(-)11·94
Western Australia.....	81·00	80·85	66·89	64·95	14·11	15·90
Tasmania*.....	55·14	61·99	46·46	46·06	8·68	15·93
Commonwealth.....	70·59	69·62	47·59	48·01	23·00	21·61
New Zealand.....	88·80	87·02	59·32	59·23	29·48	27·79
Australasia	72·72	71·90	48·96	49·48	23·76	22·42

* 1900 and 1901.

FINANCIAL RESULTS OF FOREIGN RAILWAYS.

The interest on capital cost, the proportion of working expenses to the gross revenue, and the return 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 to the years 1902 or 1901, but in some cases there is no later information than for the year 1899.

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	1,216,861,421	54,932	3·42	62·0	65·7	40·7	25·0
France	657,680,000	27,607	4·21	54·3	67·1	36·5	30·6
Germany	620,152,000	20,385	6·05	61·4	77·3	46·3	31·0
Belgium	78,544,943	27,725	4·08	66·2	55·3	37·6	17·7
United States	2,393,966,000	12,810	5·99	64·6	83·0	53·5	29·5
Canada	225,822,484	12,067	2·39	68·5	74·0	56·7	23·3
Cape Colony	22,125,085	10,363	4·41	74·6	89·0	66·4	22·6
Commonwealth of Australia	129,490,028	9,890	2·61	69·0	69·6	48·0	21·6
Australasia	143,571,763	9,658	2·61	68·7	71·9	49·5	22·4

The figures given above for Cape Colony are for state lines only.

COACHING AND GOODS TRAFFIC.

The following table shows the number of passengers carried on the lines of the various states during the years 1881, 1891-2, 1901-2, and 1902-3. The number of journeys on the Victorian lines during the year ended 30th June, 1902, approximates to those of 1888-9, 1889-90, and 1890-91, and though, in common with the rest of the states, a great reduction occurred in 1893-94, the traffic, since the latter year, has manifested an upward movement. All the states have experienced the effects of the diminished spending power of the people, following on the financial crisis, but in every case a recovery has taken place. The number of passenger journeys in Tasmania in 1902 shows a small increase compared with the returns for 1891:—

State.	Passengers carried.			
	1881.	1891-2.	1901-2.	1902-3.
New South Wales	6,907,312	19,918,916	30,885,214	32,384,138
Victoria	18,964,214	55,148,122	57,465,077	54,798,073
Queensland*	247,284	2,370,219	4,636,174	4,048,161
South Australia	3,032,714	5,744,487	9,497,222	9,061,488
Northern Territory .....	.....	4,541	3,755	3,631
Western Australia.....	67,144	456,631	8,158,299	9,106,396
Tasmania.....	102,495	704,531	777,445	761,345
Commonwealth	29,321,163	84,347,447	111,423,186	110,163,232
New Zealand	2,911,477	3,555,764	7,356,136	7,575,390
Australasia	32,232,640	87,903,211	118,779,322	117,738,622

* 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 102 per cent., varying from 44 per cent. in New Zealand to 747 per cent. in Tasmania. During the decennial period 1891-2 to 1901-2, the increase in tonnage has varied from 4 per cent. in South Australia to 1,401 per

cent. in Western Australia, with an average increase of nearly 63 per cent. for the Commonwealth, and 64 per cent. for the whole of Australasia.

State.	1881.	1891-2.	1901-2.	1902-3.
	tons.	tons.	tons.	tons.
New South Wales	2,033,850	4,296,713	6,467,552	6,596,241
Victoria	1,366,603	2,720,886	3,433,627	3,093,997
Queensland.....	161,008	768,527	1,725,520	1,566,960
South Australia.....	646,625	1,337,859	1,392,257	1,349,617
Northern Territory .....	.....	2,633	2,436	2,455
Western Australia	27,816	135,890	2,040,092	1,968,331
Tasmania	21,043	178,224	314,628	407,505
Commonwealth	4,256,945	9,440,732	15,376,112	14,985,106
New Zealand	1,437,714	2,066,791	3,529,177	3,730,394
Australasia.....	5,694,659	11,507,523	18,905,289	18,715,500

The percentage of receipts from coaching traffic to the total receipts is somewhat less in the states of the Commonwealth and New Zealand than in the United Kingdom, where for the year 1902 the coaching receipts formed 46·43 per cent. of the total obtained from goods and passenger traffic. The figures for each state are given below :—

State.	Coaching Traffic. per cent.	Goods Traffic. per cent.
New South Wales.....	42·41	57·59
Victoria	52·25	47·75
Queensland.....	37·88	62·12
South Australia.....	32·71	67·29
Northern Territory	29·38	70·62
Western Australia	30·77	69·23
Tasmania ..	46·06	53·94
Commonwealth.....	42·25	57·75
New Zealand.....	37·48	62·52
Australasia.....	41·51	58·49

AVERAGE WEIGHT OF TRAIN LOAD.

The useful comparisons that may be made between the railway systems of the various states are very limited, and greater uniformity in the presentation of the railway reports is extremely desirable in view of the provisions of the Commonwealth Act for the possible control of the railway systems by the central government. An example

of want of uniformity in an important particular is the absence of information which would enable the average train load to be ascertained. This information can only be given for two states—South Australia and New South Wales—and for the latter state, complete returns are available for three years only. The figures for South Australia show a considerable variation in the average weight during the last eight years; but, for the years 1899, 1900, and 1901, the average is uniformly high when compared with that for each of the preceding three years. In 1902 a considerable fall occurred, consequent on a falling off in tonnage carried without a commensurate reduction in mileage; a slight improvement, however, was manifested during 1903. The figures quoted do not include the business of the Northern Territory:—

Year.	Goods mileage.	Ton mileage.	Average weight of train.
			tons.
1896	2,089,911	134,846,696	64·52
1897	2,265,277	159,454,588	70·34
1898	2,273,537	157,143,651	69·11
1899	2,426,477	191,041,569	78·73
1900	2,569,958	197,079,956	76·68
1901	2,686,789	202,649,157	75·42
1902	2,468,326	170,523,167	69·08
1903	2,311,250	165,357,307	71·54

The average tonnage for goods trains is, therefore, 72·2 tons, which is 5·3 tons higher than in New South Wales, the only other system with which a comparison can be made. The New South Wales figures, with the exception of those for the years 1900, 1901, 1902, and 1903, are unsatisfactory, inasmuch as the goods mileage relates to the year ended 30th June, while the ton mileage is for the year ending 31st December following. There are no returns for 1899:—

Year.	Goods mileage.	Ton mileage.	Average weight of train.
			tons.
1896	4,001,164	255,621,932	63·9
1897	4,244,385	273,400,624	64·4
1898	4,260,368	314,996,969	73·9
1900	4,610,343	320,364,852	69·5
1901	5,836,587	404,740,360	69·4
1902	6,586,032	436,814,308	66·3
1903	6,405,756	399,578,918	62·4

The average for the period was 66·9 tons. The figures for New South Wales and for South Australia compare very favourably with the

returns of the British railways, but are very far behind those of some of the great American lines, as the following figures show :—

BRITISH RAILWAYS, 1900.

Company.	Goods mileage.	Ton mileage.	Average weight of train.
			tons.
London North-Western	22,668,940	1,311,000,000	57
Midland	27,270,791	1,377,000,000	50
Great Western	23,096,578	1,056,000,000	46
North-Eastern	17,565,768	1,055,000,000	60
Great Northern	12,027,759	534,000,000	44½
Lancashire and Yorkshire)	6,681,695	450,000,000	67
Great Eastern	8,564,851	322,000,000	37½
Great Central.....	8,328,551	360,000,000	43
Total	126,204,933	6,465,000,000	51

The New York Central appears to great advantage compared with the British lines ; the average weight of train for the years quoted was :—

	tons.		tons.
1894	249	1897	270
1895	252	1898	299
1896	268	1899	322

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 1902-3, and, considerable as are the numbers in each class, they could with advantage be largely increased in most of the states :—

State.	Engines.	Coaching Stock.	Goods Stock.
New South Wales	559	1,115	11,443
Victoria	547	1,482	9,872
Queensland	342	446	7,183
South Australia	346	435	6,021
Northern Territory	6	7	134
Western Australia.....	316	264	5,991
Tasmania.....	75	172	1,274
Commonwealth ...	2,191	3,921	41,918
New Zealand	372	751	12,992
Australasia	2,563	4,672	54,910

RAILWAY ACCIDENTS.

The persons meeting with accidents on railway lines may be grouped in three classes—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 1902-1903 in those states for which returns are available :—

State.	Passengers.		Railway Employés.		Trespassers, &c.		Total.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
New South Wales	2	37	14	737	26	34	42	808
Victoria	2	177	10	317	28	80	40	574
South Australia	1	8	2	23	5	4	8	35
Northern Territory .....	...	.....	...	.....	...	.....	...	.....

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 carried. The figures are calculated over a period of ten years and brought down to the latest available dates :—

Country.	Number of Passengers.		Average per million passengers carried.	
	Killed.	Injured.	Killed.	Injured.
Germany	609	2,484	0·1	0·4
Austria-Hungary	200	1,896	0·1	1·3
Belgium	142	1,929	0·1	1·8
Sweden	24	43	0·2	0·3
France	793	3,696	0·2	1·5
Norway	8	16	0·1	0·2
Holland	28	133	0·1	0·5
Switzerland	177	709	0·4	1·5
Russia	576	2,315	0·9	3·7
United Kingdom	137	5,707	0·01	0·56
Spain	155	924	0·5	3·3
Canada	118	934	0·7	5·4
New South Wales	57	461	0·23	1·85
Victoria	29	1,490	0·06	3·17
South Australia	11	28	0·16	0·41

NEW SOUTH WALES.

The progress of railway construction during the twenty years which followed the opening of the first line was very slow, for in 1875 the length of line in operation had only reached 435 miles. From 1876 to 1889, greater activity prevailed, no less than 1,748 miles being constructed during the period, but this rate of increase was not continued, and only 14 miles were opened during the next three years. Subsequently there was renewed activity, and the length of line opened to 30th June, 1903, was 3,138½ miles, the amount expended thereon for construction and equipment being £41,654,977, or at the rate of £13,272 per mile.

The railways of the state are divided into three branches, each representing a system of its own. The southern system, which is the most important, serving as it does the richest and most thickly-populated districts, and placing Sydney, Melbourne, and Adelaide in direct communication, has several offshoots. From Culcairn, there are two branch lines, one connecting with Corowa on the Murray River, and the other with Germanton; from The Rock a line extends to Lockhart; from Junea a branch extends as far as the town of Hay in one direction, and Finley in another, and places the important district of Riverina in direct communication with Sydney. From Cootamundra a southerly branch carries the line to Tumut, and another in a north-westerly direction to Temora; the latter will shortly be extended to Wyalong. From Murrumburrah a branch has been constructed to Blayney, on the western line, thus connecting the southern and western systems of the state. From Koorawatha a branch has been laid down to connect Grenfell with the railway system. Nearer the metropolis, the important town of Goulburn is connected with Cooma, bringing the rich pastoral district of Monaro into direct communication with Sydney. From Goulburn, a branch line has also been opened to Crookwell. Another line that forms part of the southern system has been constructed to Nowra, connecting the metropolis with the coastal district of Illawarra, which is rich alike in coal and in the produce of agriculture. The western system of railways extends from Sydney over the Blue Mountains, and has its terminus at Bourke, a distance of 503 miles from the metropolis. Leaving the mountains, the western line, after throwing out a branch from Wallerawang to Mudgee, enters the Bathurst Plains, and connects with the metropolis the rich agricultural lands of the Bathurst, Orange, and Wellington districts. Beyond Dubbo it enters the pastoral country. At Blayney, as before stated, the western line is connected with the southern system by a branch line to Murrumburrah; at Orange a branch connects that town with Forbes on the Lachlan River, and from Parkes, one of the stations on this branch line, an extension to Condobolin on the Lachlan River has been constructed. Further west, at Dubbo, a branch line extends

to Coonamble, and from the main line at Névertire, a short line extends to the town of Warren, and at Nyngan a branch line connects the important mining district of Cobar with Sydney. From Byrock a line branches off to Brewarrina. The western system also includes a short line from Blacktown to Richmond on the Hawkesbury River. The northern system originally commenced at Newcastle, but a connecting line has been constructed, making Sydney the head of the whole of the railway systems of the state. This connecting line permits of direct communication between Adelaide, Melbourne, Sydney, and Brisbane, a distance from end to end of 1,808 miles, or altogether between the terminus of Oodnadatta, in South Australia, and Cunnamulla, in Queensland, there is one continuous line of railway, 3,100 miles in length. The northern system comprises a branch from Werris Creek, *via* Narrabri and Moree, to Inverell, thus placing the Namoi and Gwydir districts in direct communication with the ports of Newcastle and Sydney. There is also under construction a line from Narrabri to Walgett, with a branch to Collarendabri. A portion of the North Coast railway has also been constructed from Murwillumbah, on the Tweed River, to Lismore on the Richmond River, and an extension through Casino to Grafton is now in course of construction. A short line branches off the main northern line at Hornsby, and connects with the north shore of Port Jackson at Milson's Point.

Up to October, 1888, the control of the railways was vested in the Minister for Works, the direct management being undertaken by an officer under the title of Commissioner. It was, however, recognised that political influence entered unduly into the management of this large public asset, and, as a consequence, the "Government Railways Act of 1888" was passed, with the object of removing the control and management of the railways from the political arena, and vesting them in three railway Commissioners, who were required to prepare for presentation to Parliament an annual report of their proceedings, and an account of all moneys received and expended during the preceding year. While the avowed object of state railway construction has been to promote settlement, apart from consideration of the profitable working of the lines, the principle has nevertheless been kept in view that in the main the railways should be self-supporting. It will be seen, from subsequent pages, that, despite the fact that the Commissioners are hampered by a large number of unprofitable lines, they have succeeded in placing the railways of the state in a satisfactory financial position.

Revenue and Working Expenses.

The net sum available to meet interest charges during the last decennial period is set forth in the following table, and the returns show that the Commissioners have achieved most important results during their term of administration. A reference to the table on page 357 will show that on two occasions during the last decennial period the railways returned a small profit after meeting the charges for working

expenses and interest on capital, while, with the exception of the last year, there has been a considerable reduction in the percentage of average loss during the ten years. Owing to the adverse season, the year 1903 has been financially the worst in the history of the railways of the state.

Year.	Gross Earnings.	Working Expenses.	Net Earnings.	Proportion of Working Expenses to Gross Earnings.
	£	£	£	per cent.
1894	2,813,541	1,591,842	1,221,699	56·58
1895	2,878,204	1,567,589	1,310,615	54·46
1896	2,820,417	1,551,888	1,268,529	55·02
1897	3,014,742	1,601,218	1,413,524	53·11
1898	3,026,748	1,614,605	1,412,143	53·34
1899	3,145,273	1,690,442	1,454,831	53·75
1900	3,163,572	1,769,520	1,394,052	55·93
1901	3,573,779	2,043,201	1,530,578	57·17
1902	3,668,686	2,267,369	1,401,317	61·80
1903	3,314,893	2,266,299	1,048,594	68·37

In the foregoing table will be found ample evidence of the economical working of the state railways under their present management, for, despite the exceedingly unfavourable conditions, the net earnings for the financial year ended 30th June, 1903, were 31·63 per cent. of the total earnings, as against 33·31 per cent. when the Commissioners took office. The financial depression of 1893, which brought about a great change in the character of the coaching traffic, and the continued unfavourable character of the seasons, adversely affected the earnings of several years; the fall in earnings, however, was met by a reduction in working expenses, so that the satisfactory results of the railway management were not greatly affected. The year 1900 compares somewhat unfavourably with the three years immediately preceding. This is due to the fact that, notwithstanding a much larger tonnage carried, the merchandise and live stock traffic showed a decrease in freight earned, clearly indicating that the traffic from these sources had been carried at less profitable rates than hitherto. The traffic in wool and hay also showed a large falling off, but there was no further diminution in the net earnings for the year 1901, the total, £1,530,578, being the largest for the period shown in the table. The revenue exceeded that of the previous year by £410,207, towards which all classes of traffic contributed. The increased traffic, the greater cost of coal and materials, and the more liberal advances granted to the wages staff, were responsible for the rise of £273,681 in the working expenses. For the year ended 30th June, 1902, however, a considerable falling off in the net earnings occurred. The rise from 57·17 to 61·80 in the percentage of working expenses to gross earnings was due to the increased volume of traffic carried at exceptionally low rates, largely contributed to by the concessions made in the carriage of starving stock and fodder. The increased cost of fuel, the additional repairs to the

rolling stock and permanent way, the necessity for hauling water for locomotive and other purposes, and the increments granted to the staff, also contributed to the reduction in net earnings. As previously pointed out, the year ended June, 1903, was the most disastrous in the history of the railways of New South Wales. Owing to the long-continued dry weather, water had to be despatched by train to several remote parts of the state, and large quantities for locomotive uses had also to be transported for long distances. The latter, of course, was carried free, while merely a nominal rate was charged for the former, the working expenses being thereby heavily burdened, with practically no corresponding gain to revenue. During the year live stock was carried at greatly reduced rates from the drought-stricken areas to places where feed was obtainable, while fodder for starving animals was carried at an extremely low charge. Exclusive of terminal charges, the average rate on all fodder carried fell to 0·04d., and on all live stock to 1·23d. per ton per mile, without taking into consideration the amount of empty, and consequently unprofitable, running involved.

The cost of working has steadily increased over the last three years of the decade, and this has in great measure been brought about by the increased cost of fuel, the heavier expenditure on stores, and the large outlay on wages. Much of the additional charge under the last-mentioned heading has been necessitated by the adoption of eight hours instead of nine hours per day for the running staff. Renewals and replacement of old stock also added a heavy burden to the total expenditure. For the last quinquennial period the average charge for maintenance amounted to £421,758, as against £313,806 for the preceding five years, the capital account having been debited only with expenditure on new lines and the outlay necessary to meet the heavy growth of passenger and goods traffic.

For 1903-4 the prospect is very encouraging. The copious rainfall over the whole of New South Wales has resulted in a prolific growth of herbage for stock, while from present appearances the wheat harvest will be the best experienced in the history of the state.

The proportion of working expenses to earnings is less in New South Wales than in any other part of Australia, as the following figures, which are the average of the five years 1899-1903, will show:—

	Per cent.
New South Wales	59·51
Victoria.....	63·72
Queensland	68·63
South Australia	60·32
Western Australia	76·54
Tasmania	79·06
New Zealand	65·81

An analysis is given hereunder of the working expenses of the New South Wales railways for the ten years, 1894-1903; in this statement the total expenses as well as the expenses per train mile and per mile of line in operation, are given. It will be seen that there has been a

general reduction in the expenditure per train mile, and this reduction is visible in all the details included in the total, with the exception of the expenditure upon locomotive power, which has slightly increased during the ten years. In regard to the working expenses generally, it may be said that the condition of affairs revealed by the table is satisfactory. When the Commissioners took over the management of the railways in 1888, large renewals of rolling stock were needed, while additional expenditure had to be incurred on permanent way and buildings. The result of this will be seen in the high outlay per train mile and per mile open in the earlier years of the decade. By the year 1896, the lines were in thorough working order, and have been so maintained since that date. The rolling stock has been very greatly improved; the tractive power of the engines has been increased, and types of locomotives adapted to the special and general needs of the traffic introduced.

Year ended 30th June.	Maintenance of Way, Works, and Buildings.	Locomotive Power.	Carriage and Wagon Repairs and Renewals.	Traffic Expenses.	Compensation.	Pensions and Gratuities.	General Charges.	Total.
	£	£	£	£	£	£	£	£
1894	418,989	507,649	127,221	458,011	5,186	10,744	64,042	1,501,842
1895	399,679	494,657	130,776	441,798	33,232	8,446	59,001	1,567,580
1896	350,964	533,255	150,073	437,591	15,248	3,875	60,879	1,551,858
1897	358,057	574,255	152,885	444,857	2,894	5,203	63,067	1,601,218
1898	353,969	597,455	139,161	455,545	3,296	4,504	60,675	1,614,605
1899	370,197	635,145	141,942	471,532	5,451	2,652	63,523	1,690,442
1900	406,044	648,767	159,630	478,818	4,164	4,250	67,847	1,769,520
1901	484,750	761,625	174,478	537,227	11,111	4,764	69,246	2,043,201
1902	521,983	875,582	184,232	588,938	20,234	6,296	70,104	2,267,369
1903	486,596	925,584	164,245	605,210	7,070	8,126	69,468	2,266,290

PER TRAIN MILE.

	d.	d.	d.	d.	d.	d.	d.	d.
1894	14·03	16·99	4·26	15·33	·18	·36	2·14	53·29
1895	12·63	15·63	4·13	13·96	1·05	·27	1·87	49·54
1896	10·91	16·53	4·67	13·60	·47	·12	1·89	48·24
1897	10·57	16·95	4·51	13·13	·09	·15	1·86	47·26
1898	10·18	17·19	4·00	13·11	·10	·13	1·75	46·46
1899	10·09	17·32	3·87	12·85	·14	·07	1·73	46·07
1899	10·09	17·32	3·87	12·85	·14	·07	1·73	46·07
1900	10·96	17·51	4·31	12·92	·11	·11	1·83	47·75
1901	10·81	16·98	3·89	11·08	·25	·10	1·55	45·56
1902	10·75	13·04	3·79	12·13	·42	·13	1·45	46·71
1903	10·11	19·23	3·41	12·53	·15	·17	1·45	47·10

PER MILE OPEN.

	£	£	£	£	£	£	£	£
1894	172·6	209·1	52·4	183·7	2·1	4·4	26·4	655·7
1895	153·9	196·6	52·0	175·6	13·2	3·4	23·4	623·1
1896	133·6	210·6	59·3	172·9	6·0	1·5	24·1	613·0
1897	139·0	223·0	59·4	172·7	1·1	2·0	24·5	621·7
1898	135·1	224·7	52·3	171·3	1·3	1·7	22·8	607·2
1899	136·0	234·9	52·5	174·4	2·0	1·0	23·5	625·2
1900	147·9	236·4	58·1	174·5	1·5	1·7	24·7	644·8
1901	174·5	274·2	62·8	193·2	4·1	1·7	25·0	735·5
1902	179·2	300·6	63·2	202·2	6·9	2·2	24·1	778·4
1903	160·4	305·1	54·1	199·5	2·4	2·7	22·3	747·0

Interest returned on Capital.

In establishing the financial results of the working of the lines it is the practice of railway authorities to compare the net returns with the nominal rate of interest payable on the railway loans or on the public debt of the state. As previously pointed out, an accurate comparison can only be made by taking the average rate of interest payable on the actual sum obtained by the state for its outstanding loans. On this basis, the lines of the state have met the interest on construction and equipment during five years only, viz., 1881, 1882, 1883, 1899, and 1901. In 1901 the lines yielded a net sum of £74,000 after paying working expenses, interest, and all charges, but the year 1902 showed a loss of £91,000, while during the year ended 30th June, 1903, the loss was £480,000. The following table shows the average loss for each year during the period 1894-1903 :—

Year.	Interest returned on Capital.	Actual Rate of Interest payable on Outstanding Loans.	Average Loss.
	per cent.	per cent.	per cent.
1894	3·46	3·89	0·43
1895	3·58	3·94	0·36
1896	3·44	3·86	0·42
1897	3·78	3·81	0·03
1898	3·74	3·78	0·04
1899	3·83	3·75	*0·08
1900	3·62	3·76	0·14
1901	3·93	3·74	*0·19
1902	3·45	3·68	0·23
1903	2·52	3·67	1·15

* Average gain.

The fluctuation of the profits is partly owing to the extension of the lines in sparsely-populated districts ; but as a result of more economical working the returns show an improvement during the period, with the exception of 1903, the position of that year being due to the special circumstances dealt with in preceding pages. Regard must be paid to the fact, moreover, that there are twenty-four branch lines on which over thirteen millions sterling have been expended which do not pay their way, the loss on these lines being about £280,000 per annum.

Earnings and Expenses per Mile.

Two important facts which demonstrate the financial position of the railways and the character of the management are the earnings per train mile and per average mile open. Although the returns now being realised cannot be compared with those of 1875, when the net earnings per train mile fell little short of 52d., and per mile open of £775, the earnings, with the exception of those for the years 1902 and 1903, are in every way encouraging. The falling off in 1902 was largely due to the

increased volume of traffic carried at exceptionally low rates, the average revenue derived from all descriptions of merchandise and live stock traffic, exclusive of terminal charges, having decreased from 1.13d. to 1.07d. per ton per mile. Under the control of the Commissioners the net return per train mile during that year was increased from 27.4d. to 28.9d., or 5.5 per cent.; while per mile of line open for traffic the advance has been from £374 to £481, or 28.6 per cent. During the year ended 30th June, 1903, the adverse circumstances already alluded to brought about a considerable reduction, and the net earnings per train mile fell to 21.79d., and per mile open for traffic to £346. The gross earnings, expenditure, and net earnings per train mile for the past ten years are shown in the following table:—

Year.	Gross Earnings per train mile.	Expenditure per train mile.	Net Earnings per train mile.
	d.	d.	d.
1894	94.18	53.29	40.89
1895	90.96	49.54	41.42
1896	87.68	48.24	39.44
1897	88.99	47.26	41.73
1898	87.10	46.46	40.64
1899	85.72	46.07	39.65
1900	85.36	47.75	37.61
1901	79.69	45.56	34.13
1902	75.58	46.71	28.87
1903	68.89	47.10	21.79

The gross earnings, expenditure, and net earnings per average mile open for the past ten years, were as follow:—

Year.	Gross Earnings per average mile open.	Expenditure per average mile open.	Net Earnings per average mile open.
	£	£	£
1894	1,159	656	503
1895	1,144	623	521
1896	1,114	613	501
1897	1,171	622	549
1898	1,138	607	531
1899	1,163	625	538
1900	1,153	645	508
1901	1,286	735	551
1902	1,259	778	481
1903	1,093	747	346

In many cases the railways of the state pass through heavy and mountainous country, involving steep gradients. For the more expeditious and economical working of the traffic, important deviations have

been and are being carried out to secure better grades and to ease the curves. While much has been done in this direction, much remains to be accomplished, as many of the lines have been constructed with an unusual proportion of steep gradients, of which the worst are on the trunk lines, and are so situated that the whole of the traffic must 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 state of the Commonwealth or New Zealand do the lines attain such an altitude. In Queensland, the maximum height is 3,008 feet; in Victoria, 2,452 feet; in South Australia, 2,024 feet; in Western Australia, 1,522 feet; and in New Zealand, 1,252 feet. Where heavy gradients prevail, the working expenditure must necessarily be heavier than in the states where the surface configuration is more level.

Coaching and Goods Traffic.

The following table shows the number of passengers carried on the lines of the state during the year 1881, and for the last ten years, together with the receipts from the traffic, and the average receipts per journey:—

Year.	Passengers carried.	Receipts from Coaching Traffic.	Average Receipts per journey.
	No.	£	d.
1881	6,907,312	488,675	16 97
1894	19,265,732	1,047,029	13 04
1895	19,725,418	1,022,901	12 45
1896	21,005,048	1,043,922	11 93
1897	22,672,924	1,098,696	11 63
1898	23,233,206	1,126,257	11 63
1899	24,726,067	1,158,198	11 22
1900	26,486,873	1,227,355	11 12
1901	29,261,324	1,370,530	11 23
1902	30,885,214	1,403,744	10 91
1903	32,384,138	1,405,888	10 42

It will be seen that the years 1896 to 1903 show far larger numbers of passenger journeys than preceding years, but less satisfactory results in the way of average receipts per journey. This does not so much arise from curtailment of long-distance travelling as from the change of a large body of travellers from first to second class—a result due to diminished means, and doubtless to some extent to the more comfortable carriages now provided for second-class passengers. A return to prosperous times should show an increase in first-class travellers, but it frequently happens that the removal of the original impelling cause is not followed by a return to previous habits, so that the railways may not altogether recover the revenue lost by the change on the part of the travelling public.

The amount of goods tonnage for the year 1881, and from 1894 to 1903 is shown in the following table :—

Year.	Tonnage of Goods and Live Stock.	Earnings.
	tons.	£
1881	2,033,850	955,551
1894	3,493,919	1,766,512
1895	4,075,093	1,855,303
1896	3,953,575	1,776,495
1897	4,567,041	1,916,046
1898	4,630,564	1,900,491
1899	5,248,320	1,987,075
1900	5,531,511	1,936,217
1901	6,398,227	2,203,249
1902	6,467,552	2,264,942
1903	6,536,241	1,909,005

The subdivision of the tonnage of goods and live stock for the year ended 30th June, 1903, into a general classification is set forth in the subjoined statement. Particulars of the tonnage are given under nine broad classes, while the table also shows the average distance goods of each class were carried, and the average earnings per ton per mile. The last figure, however, does not include the terminal charges, which would probably increase the revenue per ton per mile by about 0·20d., from 0·98d. to 1·18d. The "miscellaneous" traffic comprises timber, bark, agricultural and vegetable seeds, in 5-ton lots; firewood, in 5 ton lots; bricks, drain pipes, and various other goods. "A" and "B" classes consist of lime, fruit, vegetables, hides, tobacco leaf, lead and silver ore, caustic soda and potash, cement, copper ingots, fat and tallow, mining machinery, ore tailings, leather, agricultural implements in 5 ton lots; and various other goods.

Description of Traffic.	Tons carried.	Average number of miles each ton of traffic is carried.	Earnings per ton per mile.
		miles.	d.
Coal, coke, and shale	3,890,932	18·91	0·56
Firewood	196,895	27·08	0·75
Grain, flour, &c.	83,105	177·47	0·31
Hay, straw, and chaff	257,910	275·24	0·04
Miscellaneous	785,778	66·30	0·62
Wool	76,179	259·64	1·94
Live stock	282,058	243·76	1·23
"A" and "B" classes	517,339	119·81	0·98
All other goods	213,998	151·09	3·75
	6,304,194	63·38	0·98
Terminal charges .....	.....	.....	0·20
Total	6,304,194	63·38	1·18

The charge for carrying goods one mile along the lines of the state in 1872 was 3·6d. per ton, while after an interval of thirty-one years, it has fallen to 1·18d. The decrease, however, is to some extent more apparent than real, inasmuch as it represents a more extensive development of the mineral traffic than of the carriage of general merchandise; but, when due allowance has been made on this score, it will be found that the benefit to the general producer and consumer has been very substantial, and it may safely be taken as indicating generally the lessened cost of carriage to persons forwarding goods by rail.

VICTORIA.

Railway operations in Victoria began with the opening of the line from Flinders-street, Melbourne, to Port Melbourne. In the early years the lines constructed were chiefly in the vicinity of the metropolis, and up to the year 1865, that is in ten years, only 274 miles were laid down; during the next decennial period a further length of 312 miles was constructed. As in the case of other states, more energy was manifested during the decade ended 1885, when no less than 1,092 miles were constructed; during the next ten years the rate of progress was maintained, and a further length of 1,444 miles was opened. The length of line open for traffic on 30th June, 1903, was 3,383½ miles, upon which the sum of £40,974,493 has been expended for construction and equipment, or an average of £12,110 per mile.

The railways of the state are grouped under seven systems—the Northern, North-Eastern, Eastern, South-Eastern, North-Western, South-Western, and Suburban lines. The Northern system extends from Melbourne to Echuca; the North-Eastern stretches from Kensington to Wodonga, and is the main line connecting Melbourne with Sydney; the Eastern connects Prince's Bridge, Melbourne, with Bairnsdale; the South-Eastern runs from Lyndhurst to Port Albert; the North-Western, joining Laverton with Serviceton, is the main line connecting Melbourne with Adelaide; the South-Western runs from Breakwater to Port Fairy; and the suburban system makes provision for the requirements of the population within a distance of about 20 miles from the metropolis. Included in the seven systems are no less than ninety main, branch, and connecting lines. With the exception of the eastern and extreme north-western portions of the state, where settlement is sparse, the railway facilities provided are in advance of those of any other state, in so far as the length of the line open for traffic is concerned.

Victoria, in 1883, was the first state of the group to adopt the system of placing the management and maintenance of the railways under the control of three Commissioners. From the 1st February, 1884, to the end of 1891 the construction as well as the working of the lines was vested in this body; but on the 1st January, 1892, the duty of construction was transferred to the Board of Land and Works under

the provisions of the "Railways Act, 1891." During 1896 the number of commissioners was reduced to one; but under the Victorian Railway Commissioners Act, 1903, the control of the lines of the state was placed in the hands of three commissioners from the 1st June, 1903.

Revenue and Working Expenses.

The net earnings, that is the sum available to meet interest charges during the last decennial period, are shown in the following table:—

Year.	Gross Earnings.	Working Expenses.	Net Earnings.	Proportion of Working Expenses to Gross Earnings.
	£	£	£	per cent.
1894	2,726,159	1,651,186	1,074,973	60·57
1895	2,581,591	1,547,698	1,033,893	59·95
1896	2,401,392	1,551,433	849,959	64·61
1897	2,615,935	1,568,365	1,047,570	59·95
1898	2,608,896	1,649,793	959,103	63·24
1899	2,873,729	1,797,725	1,076,004	62·55
1900	3,025,162	1,902,540	1,122,622	62·89
1901	3,337,797	2,075,239	1,262,558	62·17
1902	3,367,843	2,166,118	1,201,725	64·31
1903	3,046,858	2,032,087	1,014,771	66·69

It will be observed that while the gross earnings for the closing year of the decade are larger than those of the opening year, the net earnings for 1903 show a considerable falling off from those of the year 1894, while the proportion of working expenses to gross earnings was also much larger during the former year. The decrease in the gross revenue in comparison with that earned during the previous twelve months, is largely, if not entirely, attributable to the almost total failure of the harvest, the collateral loss in the passenger traffic, and the partial cessation of transport facilities owing to a strike of a section of the railway service. The intervening years show similar fluctuations to those of the other states comprised within the Commonwealth, due to a variety of causes, among the principal of which are—the financial crisis, the drought that has uniformly affected the whole of Australasia for some years past, and the fact that Victoria adopted the construction of a number of branch "cockspur" lines, which had to be worked at absolute loss. In many instances the lines did not even pay working expenses, apart from interest. Continued losses resulted in the closing to traffic of some of these lines during 1896 and subsequent years, and the Report for the year ended 30th June, 1902, shows that the average loss per annum on non-paying lines is £294,697. Notwithstanding the fall in 1902, the net revenue shows a gradual tendency to improvement during the previous six years, the fall in 1898 in comparison with the previous year being due to the fact that in 1897 the receipts were swollen by the exceptional traffic occasioned by the Jubilee celebrations. In 1898 additional expenditure, arising from increases of pay to the lower-grade employees, and from

improvements and renewals of permanent-way works and rolling stock caused a large inflation in working expenses. The proportion of working expenses to gross earnings shows a decided improvement with the exception of 1902 and 1903; and consequent on extensive renewals of way, repairs and renewals of stock, the payment of increments to employees, the heavy compensation for settlement of claims for personal injury, the extra price paid for coal under new contracts, and the inclusion of a sum of £78,913 expended on "belated repairs," this figure now stands somewhat higher than it did at the commencement of the decennial period.

The necessity for reducing expenditure has received serious consideration, and, as a consequence, a considerable reduction in train mileage has taken place. The operation of the principle of percentage deductions in respect of salaries and wages has resulted in a considerable saving, while the limitation of a large proportion of the staff to an average of five days' work per week, has enabled a saving in wages for the year to be effected to the extent of £73,000. In addition, economy was practised in various matters of detail, and, generally speaking, only such works were undertaken as were regarded essential in the interests of safety and efficiency.

Great care seems to have been taken to keep down the working expenses during the first four years of the decade shown in the following analysis of the working expenditure of Victorian railways, and a reduction of over £200,000 per annum was made in spite of an addition of 200 miles to the length of line in operation. After 1896, concessions in regard to salary or wages were made to the staff, amounting to £35,000 in 1897, and £66,312 in the following year. In 1899 and 1900 additional concessions were made, involving an annual expenditure of £41,000.

The following analysis, which is on the same basis as that already given for New South Wales, gives the details of the expenditure during the ten years. It will be observed that there is an item of £93,507 per annum for pensions and gratuities. The charges for this service for New South Wales amount to £8,126, and in none of the other railway systems is there any like expenditure.

Year ended 30th June.	Maintenance of Way, Works, and Buildings.	Locomotive Power.	Carriage and Waggon Repairs and Renewals.	Traffic Expenses.	Compensation.	Pensions and Gratuities.	General Charges.	Total.
	£	£	£	£	£	£	£	£
1894	320,981	523,309	104,050	562,226	4,316	93,620	37,084	1,651,186
1895	331,198	478,439	89,129	514,131	6,806	84,509	43,486	1,547,693
1896	365,848	450,489	97,353	486,433	7,321	94,665	49,234	1,551,433
1897	381,298	451,548	101,946	497,030	4,689	83,958	47,901	1,568,365
1898	408,837	459,992	111,113	520,958	7,892	83,720	51,281	1,649,793
1899	480,792	502,763	130,659	546,754	3,611	81,284	51,862	1,797,725
1900	498,459	537,340	142,639	564,908	6,862	95,239	57,093	1,902,540
1901	518,488	646,192	147,153	600,000	7,945	90,443	56,018	2,075,239
1902	501,938	710,105	145,359	640,442	31,145	93,744	43,385	2,166,118
1903	528,253	641,319	133,614	582,167	10,729	93,507	42,498	2,032,087

Year ended 30th June.	Maintenance of Way, Works, and Buildings.	Locomotive Power.	Carriage and Waggon Repairs and Renewals.	Traffic Expenses.	Compensation.	Pensions and Gratuities.	General Charges.	Total.
PER TRAIN MILE.								
	d.	d.	d.	d.	d.	d.	d.	d.
1894	7.50	12.50	2.46	13.30	.10	2.21	.89	39.05
1895	8.31	12.00	2.24	12.90	.17	2.11	1.09	38.82
1896	9.77	12.03	2.60	12.99	.19	2.53	1.32	41.43
1897	9.92	11.74	2.65	12.93	.12	2.18	1.25	40.79
1898	10.62	11.95	2.89	13.69	.20	2.17	1.33	42.85
1899	11.88	12.42	3.23	13.51	.09	2.01	1.28	44.42
1900	11.84	12.76	3.39	13.41	.16	2.26	1.35	45.17
1901	11.25	14.02	3.19	13.21	.17	1.96	1.21	45.01
1902	10.68	15.10	3.09	13.62	.06	1.90	.92	46.06
1903	12.33	14.96	3.12	13.58	.25	2.18	.90	47.41

PER MILE OPEN.								
	£	£	£	£	£	£	£	£
1894	107.7	177.2	34.9	188.6	1.5	31.1	12.6	553.6
1895	107.4	165.1	23.9	166.8	2.2	27.5	14.1	502.0
1896	117.2	144.3	31.2	155.9	2.4	30.3	15.8	497.1
1897	122.0	144.4	32.6	159.0	1.5	26.9	15.3	501.7
1898	130.9	147.2	35.6	168.7	2.5	26.8	16.4	528.1
1899	154.0	161.0	41.9	175.1	1.2	20.0	16.6	575.8
1900	156.5	163.7	44.8	177.3	2.1	29.9	17.9	597.2
1901	160.6	200.2	45.6	188.6	2.2	23.0	17.4	642.6
1902	153.8	217.5	44.5	196.2	9.5	23.7	13.3	663.5
1903	158.4	192.3	40.1	174.6	3.2	23.0	12.7	609.3

Interest returned on Capital.

Continuing the basis adopted in the case of New South Wales of taking into consideration the absolute interest paid on the loans of the state and comparing this with the net earnings, the following table furnishes a review for the past ten years, and shows the average loss for each year of the period:—

Year.	Interest returned on Capital.	Actual Rate of Interest payable on Outstanding Loans.	Average Loss.
	per cent.	per cent.	per cent.
1894	2.88	4.04	1.16
1895	2.73	3.96	1.23
1896	2.24	3.98	1.74
1897	2.74	3.96	1.22
1898	2.49	3.93	1.44
1899	2.75	3.83	1.08
1900	2.83	3.89	1.06
1901	3.14	3.76	0.62
1902	2.96	3.72	0.76
1903	2.47	3.86	1.39

The earnings of the Victorian lines are largely reduced by the necessity of working of the lines upon which there is an annual loss of £294,697. The fluctuations in net profits are due to the opening of new lines in sparsely-settled districts and the effect of the drought upon the traffic. A gradual improvement is, however, manifest in the returns of the seven years prior to 1903, and the large shortage in the concluding year is due to the reasons already adverted to.

Earnings and Expenses per Mile.

While the present returns bear no comparison with those of 1872, when the net earnings per train mile were 73·29d. and per mile open £1,342, they are also below those secured during 1894, owing to the special circumstances already dealt with. The gross earnings, expenditure, and net earnings per train mile for the past ten years are set forth in the following table:—

Year.	Gross Earnings per train mile.	Expenditure per train mile.	Net Earnings per train mile.
	d.	d.	d.
1894	64·49	39·05	25·44
1895	64·76	38·82	25·94
1896	64·11	41·43	22·68
1897	68·03	40·79	27·24
1898	67·77	42·85	24·92
1899	71·00	44·42	26·58
1900	71·83	45·17	26·66
1901	72·39	45·01	27·38
1902	71·63	46·06	25·57
1903	71·09	47·41	23·68

The gross earnings, expenditure, and net earnings per average mile open for the past ten years were as follow:—

Year.	Gross Earnings per average mile open.	Expenditure per average mile open.	Net Earnings per average mile open.
	£	£	£
1894	914	553	361
1895	837	502	335
1896	769	497	272
1897	837	501	336
1898	835	528	307
1899	920	576	344
1900	949	597	352
1901	1,034	642	392
1902	1,031	663	368
1903	913	609	304

The tables indicate that while the gross earnings gradually improved up to 1902, the peculiar conditions of 1903 resulted in a considerable reduction on those of the previous two years. It is evident that the strictest economy will be necessary in the matter of expenditure, for the improvement in the revenue has so far been almost wholly neutralised by an increase in the working expenses.

Coaching and Goods Traffic.

The following table shows the number of passengers carried on the lines of the state during the year 1881, and for each of the last ten years, with the receipts from coaching traffic and the average receipts per journey :—

Year.	Passengers carried.	Receipts from Coaching Traffic.	Average Receipts per journey.
	No.	£	d.
1881	13,964,214	770,617	9·75
1894	40,880,378	1,359,675	7·98
1895	40,210,733	1,259,609	7·51
1896	40,993,798	1,264,219	7·40
1897	42,263,638	1,328,687	7·55
1898	43,090,749	1,325,062	7·38
1899	45,805,043	1,372,000	7·19
1900	49,332,899	1,469,910	7·15
1901	54,704,062	1,625,903	7·13
1902	57,465,077	1,648,381	6·89
1903	54,798,073	1,592,088	6·96

The number of passengers carried on the railways of Victoria reached its maximum in 1890, when no less than 58,951,796 persons made use of the lines. The reaction following on the banking crises of 1893 considerably affected the traffic, and in 1895 the number of passengers was reduced to 40,210,733; a gradual improvement, however, has since been manifest in the returns. Victoria occupies the leading position among the states as regards the number of passengers carried, the latest figures being as follow :—New South Wales, 32,384,138; Victoria, 54,798,073; Queensland, 4,048,161; South Australia, including the Northern Territory, 9,065,119; Western Australia, 9,106,396; Tasmania, 761,345; and New Zealand, 7,575,390. The superiority of the Victorian figures results from the large number of passengers carried on the suburban railways, the Melbourne system effectively serving the population within a distance of 20 miles from the centre, and carrying upwards of 88 per cent. of the total passengers. The magnitude of the suburban traffic is evidenced by the fact that the average receipts per journey during the last year are shown to be 6·96d., as against 10·42d. in New South Wales; 27·72d. in Queensland; 9·12d. in South Australia, including Northern Territory; 11·52d. in Western Australia; 31·25d. in Tasmania; and 18·26d. in New Zealand.

The amount of goods and live stock tonnage in 1881, and for each of the ten years from 1894 to 1903, with the earnings therefrom, is shown in the following table :—

Year.	Tonnage of Goods and Live Stock.	Earnings.
	Tons.	£
1881	1,366,603	894,592
1894	2,455,811	1,366,484
1895	2,435,857	1,321,982
1896	2,163,722	1,137,173
1897	2,383,445	1,287,248
1898	2,408,665	1,283,834
1899	2,779,748	1,501,729
1900	2,998,303	1,555,252
1901	3,331,860	1,711,894
1902	3,433,627	1,719,462
1903	3,093,997	1,454,770

The table indicates a gradual increase in the tonnage carried and earnings therefrom during the seven years preceding 1903. The figures for 1902 must be considered highly satisfactory, especially when it is remembered that the harvest conditions generally were not so good as in the preceding year. The considerable falling off in 1903 was due, as already pointed out, to the total failure of the harvest. Particulars of the subdivision of the tonnage of goods and live stock into a general classification are not available, and no information is furnished that will admit of a comparison being made in order to determine how far the cost of carriage per mile has been reduced during the period under review.

QUEENSLAND.

The progress of railway construction in Queensland for the first ten years after the opening of the Ipswich to Grandchester line was somewhat slow, only 268 miles having been constructed. In the decade ending in 1885, more energy was displayed, and a further length of $1,167\frac{1}{4}$ miles was constructed, while during the quinquennial periods ending in 1890 and 1895, extensions of 712 and 250 miles were opened. The length of line open on 30th June, 1903, was $2,710\frac{3}{4}$ miles, and the amount expended thereon for construction and equipment was £20,302,177, or at the rate of £7,480 per mile. During the year ended 30th June, 1903, the length of line open for traffic was increased by the opening of the extensions of the Kilkivan Branch and Mackay railways, but the total length was again reduced to $2,710\frac{3}{4}$ miles by the closing of the Bowen and Cooktown lines.

The railways of the state may be grouped into three divisions, comprising six systems. The southern division extends from Brisbane to Wallangarra in a southerly direction, to Cunnamulla in a westerly direction, and to Gladstone northerly along the coast, and has fifteen branch lines connected with it. The central division extends from Archer Park to Longreach, and has five branch lines connected with it. The northern division comprises the line from Mackay to Eton, Mirani

and Pinnacle ; the line from Townsville to Winton, with a branch to Ravenswood ; the line from Cairns to Mareeba ; and the line from Normanton to Croydon.

For many years the construction, maintenance, and control of the railways were carried out by a branch of the Public Works Office, and subsequently by a separate Ministerial Department with a Secretary responsible to Parliament and administering the details of the office in a manner similar to any other Crown Minister. The "Railways Act of 1888," however, while leaving the Minister in charge of the Department, vested the construction, management, and control of all Government railways in three Commissioners, of whom one was to be Chief Commissioner. The number was subsequently reduced to two, and later a single commissioner was appointed holding the authority formerly vested in the three: In undertaking railway construction the state is guided by other considerations than those which would direct the action of private investors, and is content, for a time at least, to recoup the expenditure in an indirect form. The disastrous result of the continued drought has operated against successful management during recent years, and in consequence of the fact that the rate of interest returned on capital expenditure during the past three years does not compare favourably with the previous years, a policy of stringent economy is to be pursued in the management of the railways, and the rates and fares have been increased with the object of reducing the deficit.

Revenue and Working Expenses.

The net sum available to meet interest charges during the last decennial period is shown in the following table:—

Year.	Gross Earnings.	Working Expenses.	Net Earnings.	Proportion of Working Expenses to Gross Earnings.
	£	£.	£	per cent.
1894	955,747	598,403	357,344	62·61
1895	1,025,512	581,973	443,539	56·75
1896	1,085,494	644,362	441,132	59·36
1897	1,179,273	684,146	495,127	58·01
1898	1,215,811	686,066	529,745	56·43
1899	1,373,475	784,811	588,664	57·14
1900	1,464,399	948,691	515,708	64·78
1901	1,316,936	1,057,981	258,955	80·34
1902	1,382,179	992,751	389,428	71·82
1903	1,234,230	863,382	370,848	69·95

With the exception of the last three years the foregoing table shows a gradual tendency towards an increase in revenue, but there have been considerable fluctuations in the proportion of working expenses to gross earnings. The net earnings for the year ended 30th June, 1900, were 35·22 per cent. of the total earnings, as against 36·33 per cent. when the railways were placed under their present control. It will be observed that the result secured for that year is considerably lower than those of the preceding two years, and is due to the fact that the railways were compelled to carry very large numbers of starving stock and large quantities of fodder at unremunerative rates. There were also heavy disbursements to replace and increase the stock of locomotives, and to carry out works which, though improving the equipment of the railways and ensuring safe running, have not been of a reproductive character, while during the year substantial increases in pay were conceded to all classes of railway employees. There was consequently a large increase in expenditure which was not accompanied by a corresponding improvement in the earnings. For the year ended 30th June, 1901, the revenue from passenger traffic showed a substantial increase; the decrease in earnings shown in the preceding table was entirely due to the loss of live stock by drought and consequent stoppage of station improvements, and to the necessity of carrying starving stock and fodder at merely nominal rates. The net earnings for the year were thus reduced to 19·66 per cent. of the total earnings. A slight improvement was manifested in the year ended 30th June, 1902, the percentage gained being 28·18 of the total earnings, the increase in rates and fares being responsible for the advance. Working expenses were curtailed by a reduction in the train mileage, and by the exercise of stringent economy in administration, and with the return of favourable seasons it was hoped that more satisfactory results would be secured. The adversity of the season during the year ended the 30th June, 1903, however, was responsible for a heavy decline. Less wool and live stock were carried, while the traffic in produce from the agricultural districts decreased by as much as 43 per cent.

An analysis of the working expenses of the Queensland railways for the ten years, 1894–1903, is given below. Taking the first year with the last it will be seen that there has been a substantial increase in the total cost, as well as in the rate per train mile and per mile of line open. In 1899 the expenditure per train mile had been reduced to 32·35d., as compared with 40·82d. in 1893 and 42·05d. in 1902. There can be no doubt that the expenditure for 1899 had been reduced below the point of safety and some services had been starved, and this necessitated in the following years an abnormal expenditure on improvements of the locomotive, carriage and waggon stock, and in bringing the equipment generally up to a better standard to ensure the safe working of the lines. In 1901 there was a considerable outlay on relaying and other heavy works; similar expenditure, or, at least,

expenditure on so large a scale, will not, of course, be needed for some little time.

Year ended 30th June.	Maintenance of Way, Works, and Buildings.	Locomotive Power.	Carriage and Waggon Repairs and Renewals.	Traffic Expenses.	General Charges.	Total.
	£	£	£	£	£	£
1894	251,946	139,231	31,201	150,045	25,980	598,403
1895	253,772	141,568	33,702	144,483	28,448	581,973
1896	248,468	172,373	34,936	161,656	26,929	644,362
1897	271,602	184,817	37,714	164,097	25,916	684,146
1898	261,706	186,226	38,719	172,503	26,912	686,066
1899	289,005	225,033	45,462	196,680	28,631	784,811
1900	335,777	302,752	56,256	221,640	32,266	948,691
1901	401,013	322,879	68,088	229,902	36,099	1,057,981
1902	355,793	317,831	71,915	226,745	20,467	992,751
1903	292,952	270,162	73,513	207,303	19,452	863,382

PER TRAIN MILE.

	d.	d.	d.	d.	d.	d.
1894	16.89	9.33	2.10	10.06	1.74	40.12
1895	14.32	8.67	2.07	8.85	1.74	35.65
1896	12.57	8.72	1.77	8.18	1.36	32.60
1897	13.20	8.98	1.83	7.97	1.26	33.24
1898	12.54	8.92	1.86	8.27	1.29	32.88
1899	11.91	9.28	1.87	8.11	1.18	32.35
1900	12.54	11.31	2.10	8.28	1.20	35.43
1901	16.63	13.39	2.82	9.53	1.50	43.87
1902	15.07	13.46	3.05	9.60	0.87	42.05
1903	14.21	13.10	3.57	10.06	0.94	41.88

PER MILE OPEN.

	£	£	£	£	£	£
1894	106.0	58.6	13.1	63.1	10.9	251.7
1895	98.3	59.5	14.2	60.7	11.9	244.6
1896	104.3	72.3	14.7	67.8	11.3	270.4
1897	111.9	76.2	15.5	67.6	10.7	281.9
1898	101.2	72.0	15.0	66.7	10.4	265.3
1899	106.5	82.9	16.8	72.5	10.6	289.3
1900	120.1	108.3	20.1	79.3	11.5	339.3
1901	143.1	115.3	24.3	82.1	12.9	377.7
1902	127.0	113.5	25.7	81.0	7.3	354.5
1903	105.5	97.2	26.5	74.6	7.0	310.8

Interest returned on Capital.

The financial results of the working of the lines are exhibited in the following table which covers a period of ten years :—

Year.	Interest returned on Capital.	Actual Rate of Interest payable on Outstanding Loans.	Average Loss.
	per cent.	per cent.	per cent.
1894	2·18	4·17	1·99
1895	2·68	4·16	1·48
1896	2·63	4·09	1·46
1897	2·87	4·04	1·17
1898	2·92	4·04	1·12
1899	3·15	4·00	0·85
1900	2·67	4·02	1·35
1901	1·31	3·98	2·67
1902	1·93	3·94	2·01
1903	1·48	3·92	2·44

A fair proportion of the railway construction of recent years has been in country of a purely pastoral character, and it is manifest that a sufficient traffic to prove remunerative cannot be looked for immediately from localities possessed of only a scattered and limited population; but it is confidently expected that these lines will ultimately pay interest on cost of construction. Unfortunately, Queensland, in common with the other provinces, is burdened with lines of railway not warranted by existing or prospective traffic, and these will always be a handicap to successful management.

Earnings and Expenses per Mile.

While the results now secured cannot be compared with those of 1880, when the net earnings per train mile were a little over 43d., and per mile open £222, a satisfactory state of affairs is disclosed by a review of the figures for earnings shown in the subjoined tables. It will be seen that the net earnings per train mile, as well as the net return for each mile of line open, have, except in the last four years, been fairly well sustained. The fall in 1900, 1901, 1902, and 1903, as compared with the previous three years, is due to the fact that the continuance of the

drought and the consequent loss in sheep and cattle have operated against the revenue from the carriage of wool and live stock, while the increased traffic which was obtained consisted largely of the removal of starving stock from and the carriage of fodder to drought-stricken districts, a class of traffic which had to be undertaken at unremunerative rates. The gross earnings, expenditure, and net earnings per train mile for the past ten years are shown in the following table:—

Year.	Gross Earnings per train mile.	Expenditure per train mile.	Net Earnings per train mile.
	d.	d.	d.
1894	64·18	40·12	24·06
1895	62·82	35·65	27·17
1896	54·91	32·60	22·31
1897	57·30	33·24	24·06
1898	58·27	32·88	25·39
1899	56·62	32·35	24·27
1900	54·69	35·43	19·26
1901	54·61	43·87	10·74
1902	58·54	42·05	16·49
1903	59·87	41·88	17·99

The gross earnings, expenditure, and net earnings per average mile open for the past ten years were as follow:—

Year.	Gross Earnings per average mile open.	Expenditure per average mile open.	Net Earnings per average mile open.
	£	£	£
1894	402	251	151
1895	431	244	187
1896	455	270	185
1897	486	281	205
1898	470	265	205
1899	506	289	217
1900	523	339	184
1901	470	377	93
1902	493	354	139
1903	444	311	133

Coaching and Goods Traffic.

The number of passengers carried on the lines of the state during the year 1881, and for the last ten years, together with the receipts from the traffic, and the average receipts per journey, are set forth in the following table:—

Year.	Passengers carried.	Receipts from Coaching traffic.	Average Receipts per Journey.
	No.	£	d.
1881	247,284	113,490	110·14
1894	2,024,450	307,430	36·44
1895	2,054,416	308,025	35·98
1896	2,274,219	324,790	34·27
1897	2,633,556	359,811	32·79
1898	2,742,108	391,270	34·24
1899	3,716,425	447,123	28·87
1900	4,395,841	505,536	27·60
1901	4,760,559	536,462	27·05
1902	4,636,174	513,257	26·59
1903	4,048,161	467,594	27·72

It will be seen that the years 1899, 1900, 1901, 1902, and 1903 show a far larger number of passenger journeys than preceding years; this was largely due to an extraordinary expansion in the suburban traffic. The falling off in 1903 as compared with the three preceding years occurred almost wholly on the lines of the Southern Division. During the period the average receipts per journey show a decline, which may be expected to continue as the suburban traffic expands, so that in a few years the receipts per person carried will approximate closely to the average for the rest of Australia, viz., one shilling per journey.

The amount of goods tonnage for a similar period is shown in the following table:—

Year.	Tonnage of Goods.	Earnings.
1881.....	161,008 ...	£235,100
1894.....	785,475 ...	648,317
1895.....	900,591 ...	717,487
1896.....	1,026,889 ...	760,704
1897.....	1,243,603 ...	819,462
1898.....	1,323,782 ...	824,541
1899.....	1,684,858 ...	926,352
1900.....	1,688,635 ...	958,863
1901.....	1,530,440 ...	780,474
1902.....	1,725,520 ...	868,922
1903.....	1,566,960 ...	766,636

In the foregoing statement the tonnage of live stock is not included, the information not being available, but the earnings shown include the revenue derived from this class of traffic. The general traffic is divided

into eight classes, particulars of which, for the year ended 30th June, 1903, together with the receipts for each class, are shown in the sub-joined table. No information is available as to the average number of miles each ton of traffic is carried, or the earnings per ton per mile.

Description of Traffic.	Tons carried.	Receipts from traffic.
General merchandise	241,938	... £353,877
Agricultural produce	229,217	... 94,239
Wool	18,490	... 57,021
Coal.....	372,947	... 56,700
Minerals other than coal ..	313,473	... 34,815
Timber	390,895	... 83,606
Live stock .....	.....	... 86,378
Total	1,566,960	... £766,636

Guaranteed Railways.

Up to the 30th June, 1903, four railways, having a total length of 36 miles 55 chains, were constructed under "The Railways Guarantee Act of 1895." In accordance with this Act the local authority, representing the ratepayers of a district, agrees to pay up to one-half of the deficiency in working expenses with interest at the rate of 4 per cent. on the capital cost during the first fourteen years after opening, the sum to be raised by means of a rate not exceeding 3d. in the £ of value of ratable lands. Should the operations of any year provide a surplus, half of this is retained by the Government and the other half paid to the local authority for distribution among the ratepayers in return for the payments made on account of the deficiency in previous years. When the line has been payable for three years, the Government may cancel the agreement. The results of the working of three out of the four railways do not afford much encouragement to apply the provisions of the Act to other lines which may be projected in the future. The Pinalba branch, on which the expenditure to 30th June, 1903, was £46,085, showed, without taking into consideration the interest on capital cost, a net revenue for the year 1899 of £715; in 1900, £966; in 1901, £994; in 1902, £1,139; while in 1903, there was a loss of £219. Leaving out of consideration the interest on a capital cost of £11,385, the Allora branch shows a net revenue of £262 in 1899; £120 in 1900; and £105 in 1902; while in the year 1901, there was a loss of £182, and in the year just closed a further loss of £187. A capital expenditure of £47,632 has been incurred in connection with the Enoggera branch, and leaving out of consideration the interest charge thereon, there was a net revenue of £159 in 1899, and £67 in 1900, while the loss in 1901 was £440; in 1902, £235; and in 1903, £737. The Mount Morgan branch, which up to the 30th June, 1902, had involved a capital expenditure of £84,407, has given satisfactory results. The net revenue, leaving out of consideration the interest on capital cost, was £7,127 in 1899; £9,084 in 1900; £6,297 in 1901; £4,872 in 1902; and £4,147 in 1903.

SOUTH AUSTRALIA.

While the beginning of railway construction in South Australia dates as far back as 1854, very little progress was made in the subsequent twenty years, and in 1874 the total length of line in operation was only 234 miles; in 1880 this had increased to 627 miles; in 1890 to 1,610 miles; and in 1895 to 1,722 miles. The length of line in operation on the 30th June, 1903, was 1,736½ miles, and the amount expended thereon for construction and equipment, £13,400,796, or at the rate of £7,718 per mile.

The railways of South Australia proper are divided for the purposes of management into five systems. The Midland system, constructed on the 5ft. 3in. gauge, has a length of 236½ miles, and extends from Adelaide to Terowie in a northerly direction, and to Morgan, on the Murray River, in a north-easterly direction. The Northern system has a total length of 1,008¼ miles, 1,003 of which are 3 ft. 6 in. gauge, and 5½ miles 5 ft. 3 in. gauge. This system includes that portion of the transcontinental line which extends to Oodnadatta, a distance of 550 miles from Adelaide; the line to Cockburn, which provides for the requirements of the Broken Hill district of New South Wales; and branches to Port Augusta, Port Pirie, Wallaroo, and Port Wakefield. The Southern system comprises a length of 265¼ miles on a gauge of 5 ft. 3 in., and includes the main line connecting Adelaide with Melbourne, and branches—Wolseley to Naracoorte and from Naracoorte to Kingston, Mount Gambier, and Beechport. The line from Port Broughton to Barunga has a length of 10 miles.

During 1887 the control of the railways was entrusted to three commissioners; in 1895, however, the number was reduced to one, who is responsible to Parliament.

Revenue and Working Expenses.

The net sum available to meet interest charges is set forth in the following table:—

Year.	Gross Earnings.	Working Expenses.	Net Earnings.	Proportion of Working Expenses to Gross Earnings.
	£	£	£	£
1894	999,707	569,592	430,115	56·98
1895	960,155	568,973	391,182	59·26
1896	986,500	583,022	403,478	59·10
1897	1,025,035	614,254	410,781	59·92
1898	984,228	603,474	380,754	61·31
1899	1,058,397	617,380	441,017	58·33
1900	1,166,987	657,841	509,146	56·37
1901	1,236,616	729,039	507,577	58·95
1902	1,085,175	689,517	395,658	63·54
1903	1,076,612	624,511	452,101	58·01

The foregoing table shows that the gross earnings in 1901 were the largest during the decade, while the proportion of working expenses to gross earnings was lowest in 1900, the net earnings in the latter year being the highest for the period. The failure of the harvest and the

succession of adverse seasons which South Australia laboured under during part of the decennial period are the causes of the falling off in the revenue for several years. No other railway system in Australia depends so much upon the carriage of agricultural produce for its traffic, and years of shrinkage in the railway revenue are coincident with years of harvest failure. The increase in working expenses during the years 1899 and 1900 was due to the renewal of rolling stock, the relaying of portion of the permanent way, and other outlay expended from the improved revenue. The further increase during 1901 is explained by the rise in the price of coal and materials; by the increased train mileage; and by the fact that opportunity was taken of a fairly good year's revenue to debit working expenses with an unusual outlay under the head of "replacements." The operations of the year ended 30th June, 1902, show a considerable reduction in the gross earnings, which is attributable to the shrinkage in the Barrier traffic caused by the fall in the price of lead reducing the output of the mines. Moreover, consequent on the decrease in mining profits, the department was compelled to carry ore and concentrates at much lower rates, so that there was a diminished receipt from every ton of a smaller volume of traffic, and an increase in the proportion of working expenses to gross earnings. While the gross earnings for the year ended 30th June, 1903, exhibit a slight shortage in comparison with those of the previous year, a large reduction is manifest in the working expenses. This has been secured by restricting expenditure in every branch, and the postponement of repairs and renewals, which it would have been the truest economy to effect. The results secured may be looked upon as fairly satisfactory, when it is considered that the management is burdened with some very unproductive lines, notably that from Hergott Springs to Oodnadatta, which barely pays working expenses, and entails an annual payment of about £44,000 in interest.

The working expenditure of the South Australian lines, an analysis of which is given below, does not show very much variation from year to year. The average reached its lowest point in the year 1900 with 37·78d. per train mile; since then there has been a rise of about 2d. per train mile, which the railway managers attribute to the increased price of coal and materials, to larger expenditure on repairs and rolling stock, and to increases in the wages of the employees.

Year ended 30th June.	Maintenance of Way, Works, and Buildings.	Locomotive Power.	Carriage and Waggon Repairs and Renewals.	Traffic Expenses.	Compensation.	General Charges.	Total.
	£	£	£	£	£	£	£
1894	141,625	225,871	37,292	147,755	166	16,883	569,502
1895	138,983	214,271	51,956	147,173	73	16,517	568,973
1896	137,855	221,706	62,882	146,127	162	14,290	583,022
1897	159,798	244,235	50,546	144,935	713	14,027	614,254
1898	152,091	234,233	52,323	150,033	826	13,968	603,474
1899	160,514	236,004	53,754	146,962	645	13,901	617,380
1900	163,851	255,582	62,332	160,641	637	14,293	657,341
1901	185,202	293,913	63,654	164,589	1,562	15,029	729,039
1902	166,691	278,339	64,733	162,626	1,304	15,234	639,517
1903	139,297	265,343	51,874	151,738	1,663	14,696	624,511

Year ended 30th June.	Maintenance of Way, Works, and Buildings.	Locomotive Power.	Carriage and Waggon Repairs and Renewals.	Traffic Expenses.	Compensation.	General Charges.	Total.
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PER TRAIN MILE.

	d.	d.	d.	d.	d.	d.	d.
1894	9.80	15.61	2.58	10.22	0.01	1.17	39.39
1895	9.83	15.15	3.67	10.41	0.01	1.17	40.24
1896	9.58	15.42	4.37	10.16	0.01	0.99	40.53
1897	10.44	15.94	3.30	9.47	0.05	0.92	40.12
1898	9.82	15.14	3.38	9.69	0.05	0.90	38.98
1899	9.88	14.56	3.62	9.05	0.04	0.85	38.00
1900	9.41	14.67	3.61	9.23	0.04	0.82	37.78
1901	10.12	16.06	3.75	8.99	0.09	0.82	39.83
1902	9.53	15.96	3.70	9.30	0.08	0.87	39.44
1903	8.87	16.89	3.80	9.66	0.10	0.93	39.75

PER MILE OPEN.

	£	£	£	£	£	£	£
1894	85.1	135.7	22.4	88.8	....	10.1	342.1
1895	80.7	124.4	30.2	85.5	....	9.6	330.4
1896	80.1	128.7	36.5	84.9	....	8.3	338.5
1897	92.8	141.8	29.3	84.1	0.4	8.1	356.5
1898	88.2	135.9	30.4	87.0	0.5	8.1	350.1
1899	93.1	137.3	34.1	85.3	0.4	8.0	358.2
1900	94.7	147.7	36.3	92.8	0.4	8.2	380.1
1901	108.7	169.3	39.5	94.8	0.9	8.7	419.9
1902	96.0	160.6	37.3	93.6	0.8	8.8	397.1
1903	80.0	153.0	30.0	87.0	1.0	9.0	360.0

Interest returned on Capital.

The following table exhibits the financial results of the working of the lines during the last ten years:—

Year.	Interest returned on Capital.	Actual rate of Interest payable on Outstanding Loans.	Average Loss.
	per cent.	per cent.	per cent.
1894	3.54	4.27	0.73
1895	3.12	4.22	1.10
1896	3.21	4.12	0.91
1897	3.26	4.05	0.79
1898	2.98	4.03	1.05
1899	3.42	3.95	0.53
1900	3.91	3.89	0.02*
1901	3.86	3.87	0.01
1902	2.98	3.81	0.83
1903	3.08	3.74	0.66

* Represents profit.

The interest returned on capital during 1900 was the highest secured since 1892, when the railways returned 4.78 per cent. on capital expenditure, and exceeded by a slight amount the interest rate on the debt of the province. South Australia possesses one advantage not shared by any other province, namely, a large and steady long-distance

traffic from a neighbouring state. The Broken Hill traffic is a very important factor in the railway revenue, as the greater portion of the line connecting the mines with the seaports runs through South Australian territory. The extent of the Broken Hill traffic will be found mentioned on page 380.

Earnings and Expenses per Mile.

The net earnings now secured are very much below those of 1891 when the return per train mile was 38·64d., and per mile open £370; a gradual improvement is, however, noticeable up to 1900, the fall in 1901 and 1902 being due to the reasons already adverted to on a previous page. The figures for 1903 again show an upward tendency. The gross earnings, expenditure, and net earnings per train mile for the past ten years are shown in the following table:—

Year.	Gross Earnings per train mile.	Expenditure per train mile.	Net Earnings per train mile.
	d.	d.	d.
1894	69·14	39·39	29·75
1895	67·90	40·24	27·66
1896	68·57	40·53	28·04
1897	66·95	40·12	26·83
1898	63·57	38·93	24·59
1899	65·14	38·00	27·14
1900	67·02	37·78	29·24
1901	67·56	39·83	27·73
1902	62·06	39·44	22·62
1903	68·53	39·75	28·78

The gross earnings, expenditure, and net earnings per average mile open for the past ten years are set forth in the following table:—

Year.	Gross Earnings per average mile open.	Expenditure per average mile open.	Net Earnings per average mile open.
	£	£	£
1894	601	342	259
1895	558	330	228
1896	573	338	235
1897	595	356	239
1898	571	350	221
1899	614	358	256
1900	674	380	294
1901	712	419	293
1902	625	397	228
1903	620	360	260

The results for the year 1900 may be viewed as satisfactory, taking into consideration the fact that the number of train miles run during

that year was higher than in any previous year during the period. It will be seen that there was a substantial fall in the net earnings per train mile for the year ended 30th June, 1902, due to the reasons already referred to. The present earnings per train mile, and the return per mile of line open are above the average of the Commonwealth as a whole.

Coaching and Goods Traffic.

The following table shows the number of passengers carried on the lines of the state during the year 1881, and for each of the last ten years, together with the receipts from the traffic, and the average receipts per journey :—

Year.	Passengers carried..	Receipts from Coaching Traffic.	Average Receipts per Journey.
	No.	£	d.
1881	3,032,714	151,867	12-01
1894	5,260,079	274,243	12-51
1895	5,224,854	263,448	12-09
1896	5,435,956	288,594	12-73
1897	5,789,297	297,026	12-31
1898	6,050,189	291,411	11-56
1899	6,171,081	297,207	11-56
1900	7,416,506	337,723	10-93
1901	8,863,632	359,172	9-74
1902	9,643,058	369,677	9-34
1903	9,061,488	342,037	9-05

The table indicates an improvement in the number of passengers carried; the falling off during the last year in comparison with 1902 being due to the less prosperous season; the average receipts per journey have, however, gradually declined.

The amount of goods tonnage for the same period is shown in the following table :—

Year.	Tonnage of Goods and Live Stock.	Earnings.
	No.	£
1881	646,625	222,184
1894	1,014,010	694,724
1895	1,000,408	666,600
1896	1,056,963	670,961
1897	1,146,293	700,629
1898	1,189,095	664,348
1899	1,403,727	731,156
1900	1,485,976	798,231
1901	1,628,444	843,019
1902	1,392,257	681,045
1903	1,349,617	703,522

Fluctuation in the tonnage of goods carried is presented by the figures in the foregoing table, and the considerable decrease manifested in the past two years, in comparison with 1901, is due to the continuous

fall in the metal market not only reducing the output, but leading to a general slackness of business on the Barrier, while, in addition, ore and concentrates were carried at lower rates. The volume of traffic secured by South Australia from the Barrier District of New South Wales amounted to 491,711 tons out of the total of 1,349,617 tons, and the receipts from all traffic passing through Cockburn to £339,341 out of a revenue of £1,076,612.

The following table shows a classification of the goods carried during 1903, and the amount received for carriage. It would have been interesting to exhibit also the charge for haulage of each description of goods during the last ten years, but no information is available which will enable such particulars to be compiled. There has been a general reduction in freight charges, and the average charge per ton per mile for all goods has fallen from 1·05d. in 1897 to 1·03d. in 1903:—

Description of Traffic.	Tons Carried.	Receipts from Traffic. £
Minerals	546,701	226,728
Grain	101,602	29,578
Wool.....	14,798	19,690
Goods other than above	647,066	355,166
Live stock	39,450	72,360

NORTHERN TERRITORY.

Railway construction in the Northern Territory has been confined to the line from Palmerston to Pine Creek, opened on the 1st October, 1889, and the returns for the past eight years show that the traffic does not even pay working expenses.

Revenue and Working Expenses.

The gross earnings, expenditure, and net earnings, with the proportion of working expenses to gross earnings of the line are set forth in the following table, which covers a period of ten years:—

Year.	Gross Earnings.	Working Expenses.	Net Earnings.	Proportion of Working Expenses to Gross Earnings.
	£	£	£.	per cent.
1894	16,193	11,403	4,790	70·42
1895	14,722	11,477	3,245	77·96
1896	15,105	15,289	(—) 184	101·22
1897	17,908	18,966	(—) 1,058	105·91
1898	14,124	20,268	(—) 6,144	143·50
1899	14,758	17,375	(—) 2,617	117·73
1900	14,799	24,340	(—) 9,541	164·47
1901	13,845	25,280	(—) 11,435	182·59
1902	12,522	34,649	(—) 22,127	276·70
1903	11,298	12,812	(—) 1,514	113·40

(—) Denotes loss.

The experience of the past eight years offers no encouragement to any further extension of railways in the Northern Territory. The actual results of working have not been quite so unfavourable as would appear from the foregoing table, as each of the two years 1900 and 1901 was charged with the payment of an instalment of £10,000, and 1902 with the final instalment of £21,931, towards the reconstruction of the jetty which was destroyed by a hurricane in 1896.

The expenditure on working for 1903 may be divided as follows :—

	£
Maintenance of Permanent Way Buildings, &c.....	6,981
Locomotive Power.....	2,479
Carriage and Waggon Repairs	972
Traffic Expenses.....	1,935
General Charges.....	445
Total.....	12,812

These figures are equivalent to 101·07d. per train mile, and £88·10 per mile of line open for traffic.

Interest returned on Capital.

The following table shows the average loss for each year during the last ten years, after the interest on cost of construction has been deducted from the net earnings :—

Year.	Interest returned on Capital.	Actual Rate of Interest payable on Outstanding Loans.	Average Loss.
	per cent.	per cent.	per cent.
1894	0·42	4·08	3·66
1895	0·28	4·22	3·94
1896	(—) 0·02	4·12	4·14
1897	(—) 0·09	4·05	4·14
1898	(—) 0·53	4·03	4·56
1899	(—) 0·22	3·95	4·17
1900	(—) 0·82	4·04	4·86
1901	(—) 0·98	4·05	5·03
1902	(—) 1·99	4·37	6·36
1903	(—) 0·13	4·37	4·50

(—) Denotes loss.

From the outset there was very little prospect that the traffic on this line would meet the interest on the cost of construction and equipment ; and although for the first five years there was a margin after paying working expenses, the results of the past eight years show that even working expenses have not been met. The deficiency is in part due to the heavy expenditure necessitated by the ravages of the teredo in the sub-structure of the jetty at Palmerston, and the large outlay to repair damages caused by the cyclone which struck Port Darwin in the early

part of 1897. Fluctuations in the volume of traffic are also partly responsible for the deficiency.

Earnings and Expenses per Mile.

The gross earnings, expenditure, and net earnings per train mile for a period of ten years are shown in the following table :—

Year.	Gross Earnings per Train Mile.	Expenditure per Train Mile.	Net Earnings per Train Mile.
	d.	d.	d.
1894	125·14	88·12	37·02
1895	115·10	89·73	25·37
1896	114·28	115·67	(—) 1·39
1897	137·28	145·38	(—) 8·10
1898	112·97	162·12	(—) 49·15
1899	115·53	136·02	(—) 20·49
1900	114·53	188·37	(—) 73·84
1901	109·75	200·39	(—) 90·64
1902	99·26	274·65	(—) 175·39
1903	89·13	101·07	(—) 11·94

(—) Denotes loss.

The gross earnings, expenditure, and net earnings per average mile open for the last decennial period were as follow :—

Year.	Gross Earnings per average mile open.	Expenditure per average mile open.	Net Earnings per average mile open.
	£	£	£
1894	111	78	33
1895	101	79	22
1896	104	105	(—) 1
1897	123	130	(—) 7
1898	97	139	(—) 42
1899	102	119	(—) 17
1900	102	167	(—) 65
1901	95	174	(—) 79
1902	86	238	(—) 152
1903	78	88	(—) 10

(—) Denotes loss.

The gross earnings show little variation from year to year, but the expenditure was increased through the series of accidents at the terminal port, to which reference has already been made.

Coaching and Goods Traffic.

The following table shows the number of passengers carried on the Palmerston to Pine Creek Line since its opening, together with

the receipts from the traffic and the average receipts per journey :—

Year.	Passengers carried.	Receipts from Coaching Traffic.	Average Receipts per journey.
	No.	£	d.
1890 (nine months)	4,567	4,330	227·54
1891	4,515	4,693	249·45
1892	4,541	4,159	219·80
1893	6,169	4,007	155·89
1894	4,076	3,820	224·91
1895	2,950	3,755	305·48
1896	2,901	3,772	312·04
1897	3,080	4,055	315·97
1898	3,126	3,556	273·01
1899	3,191	3,173	238·64
1900	3,374	3,556	260·48
1901	4,097	3,415	200·05
1902	3,755	3,032	193·80
1903	3,631	2,913	192·53

The table shows an increase in the number of passengers carried during 1893 ; but the promise of the year was not sustained, and the traffic fell away by more than one-half during 1895, 1896, and 1897, although the earnings did not decline in anything like the same proportion. Since the year last mentioned there has been a steady, though small, increase in the number of passengers ; but without a corresponding addition to the revenue. The receipts per journey indicate that a large proportion of the traffic is of a long-distance character.

The amount of goods tonnage for a similar period is shown in the following table :—

Year.	Tonnage of Goods and Live Stock.	Earnings.
	Tons.	£
1890 (nine months)	2,114	7,499
1891	2,426	9,035
1892	2,633	9,267
1893	2,328	9,470
1894	2,524	10,260
1895	2,053	8,643
1896	2,493	9,149
1897	3,150	11,222
1898	2,678	8,570
1899	3,187	10,091
1900	3,009	9,626
1901	2,981	8,892
1902	2,436	7,996
1903	2,455	7,000

The average receipts per ton per mile during the year 1903 were 7·39d., as against 8·43d. in 1896.

WESTERN AUSTRALIA.

The first railway constructed in Western Australia was that from Geraldton to Northampton, a length of 34 miles 17 chains, opened for traffic on the 26th July, 1879. Between that date and the close of 1885, a further length of 91 miles 55 chains was constructed. To the end of 1890, only 200½ miles were constructed, and on the 30th June, 1895, there were 57½ miles open for traffic. Railway construction received a considerable impetus subsequent to 1895, and on the 30th June, 1903, there were 1,516 miles open for traffic, at a cost of £8,141,782 for construction and equipment, or at the rate of £5,370 per mile.

The state railways of Western Australia are comprised in five systems. The Eastern system has a length of 196 miles, and includes the line from Fremantle to Northam, with branches to Newcastle, Beverley, Greenhills, Perth Racecourse, and Owen's Anchorage, the Mahogany Creek deviation, and Goomalling; the Eastern Gold Fields system extends eastward from Northam, and includes the Kanowna, Menzies, Leonora, and Boulder branches, the total length being 491 miles; the South-western system comprises the line from East Perth to Bunbury, with branches to Colliefields, Bridgetown, Busselton, and Canning and Bunbury Racecourses, and has a length of 234 miles; the Northern system includes the line from Geraldton to Cue and Nannine, with branches to Walkaway, Mullewa, and Northampton, the total length being 352 miles; and the Great Southern system, from Beverley to Albany, is 243 miles in length.

The control of the state railways was formerly vested in the Commissioner for Railways as member of the Government, the active management being undertaken by an officer with the title of General Manager, but on the 1st July, 1902, the administration was placed in the hands of an independent Commissioner.

Revenue and Working Expenses.

The net sum available to meet interest charges during the last ten years is shown in the following table:—

Year.	Gross Earnings.	Working Expenses.	Net Earnings.	Proportion of Working Expenses to Gross Earnings.
	£	£	£	per cent.
1894	140,564	103,973	36,591	73·96
1895	296,000	182,046	113,954	61·50
1896	529,616	263,704	265,912	49·79
1897	915,483	577,655	337,828	63·09
1898	1,019,677	786,318	233,359	77·11
1899	1,004,620	712,329	292,291	70·91
1900	1,259,512	861,470	398,042	68·40
1901	1,353,704	1,044,920	308,784	77·19
1902	1,521,429	1,256,370	265,059	82·58
1903	1,533,485	1,247,873	305,612	80·33

From the foregoing statement it will be seen that the gross earnings have increased from £140,564 in 1894 to £1,553,485 in 1903. The rush to the gold-fields of Western Australia has brought an enormous amount of traffic to the railways of that state, and the lines stand in a position which it is impossible for those of any other province to attain, except under similar circumstances. The proportion of working expenses to gross earnings during the ten years has increased from 73·96 per cent. to 80·33 per cent., the intervening years showing considerable irregularity. The rates for the carriage of merchandise are so low that the revenue derived from the traffic is hardly sufficient to pay for working it, and with a view to economy during 1899 the train service was considerably curtailed, and trains previously confined to passenger traffic were converted into mixed trains, conveying both passengers and goods, the result being a substantial reduction in working expenses proportionately to the gross earnings.

The relation of working expenses to gross earnings for 1903 showed a percentage of 80·33, as compared with 82·58, 77·19, and 68·40 in the preceding three years. The comparatively large increase during the period is attributable to several causes. There was a substantial addition to the tonnage of coal, timber, and goods hauled at low rates, but no profit was returned therefrom, the receipts only about equalling the working expenses in connection therewith. A heavy expenditure was incurred on locomotive repairs, and among other contributing causes were the rise in price of coal and stores, and increased rates of wages.

Western Australian lines show much greater variation from year to year than the lines of any other state. During the ten years 1894–1903, the lowest expenditure was in 1894 with 38·92d. per train mile, which rose to 66·89d. in 1902, but dropped to 64·95d. in 1903. The conditions, however, in the earlier years of the decade, when only 321 miles of line were open for traffic, and the train miles run amounted only to 641,080, were entirely different from those of 1903 with 1,516 miles open for traffic and an aggregate train mileage of 4,611,315. In 1899 there was a reduction in the total working expenses, brought about mainly by the curtailment of the mileage; this was accomplished by reducing the number of passenger trains and adopting a system of mixed trains. In the year 1900 there was a large increase in the number of locomotives, and in the repairs to carriages, waggons, &c. This increase, so far as can be seen, was attributable, partly to the natural development of the traffic, but chiefly to the inadequate workshop accommodation and to the fact that the water supply for railways was both inferior and expensive. The year 1901 showed a great advance in the cost of the railways, the expenditure per train mile rising from 49·04d. to 60·78d., every branch participating in the increase. It was in this year that the fifty-four hours per week system was introduced, involving the employment of an increased wages staff, and in addition thereto there was a general increase in the rates of wages. The conditions of working at Fremantle locomotive shops entailed a large outlay, and, in addition, there was

an increased expenditure on locomotives due to the compulsory use of bad water, and the overwork of rolling stock owing to a shortage of hauling power and waggons. During the year named the railways were undoubtedly worked at a very great disadvantage.

The increased expenditure per train mile in 1901 was continued during 1902, when it rose from 60·78d. to 66·89d., in consequence of the expanded outlay in all branches of the service. There was a specially heavy expenditure in the locomotive branch, amounting to £173,297. In 1903, however, the average per train mile fell to 64·95d.

Year.	Mainten- ance of Way, Works, and Buildings.	Locomotive Power, Carriage and Waggon Repairs.	Traffic Expenses.	Compensa- tion.	General Charges.	Total.
	£	£	£	£	£	£
1894	20,493	47,129	31,250	.....	5,101	103,973
1895	36,202	86,453	50,725	.....	8,666	182,046
1896	56,036	101,692	94,388	.....	11,588	263,704
1897	97,184	221,884	225,615	11,651	21,321	577,655
1898	176,741	315,066	266,167	9,803	18,541	786,318
1899	165,277	297,500	227,225	3,568	18,759	712,329
1900	183,096	406,565	252,750	4,455	14,604	861,470
1901	221,451	497,188	296,045	6,926	23,310	1,044,920
1902	246,931	670,485	306,408	7,246	25,300	1,256,370
1903	265,548	642,808	312,364	4,808	22,345	1,247,873

PER TRAIN MILE.

	d.	d.	d.	d.	d.	d.
1894	7·67	17·64	11·70	.....	1·91	38·92
1895	8·71	20·80	12·21	.....	2·08	43·80
1896	8·72	15·83	14·69	.....	1·81	41·05
1897	9·19	20·97	21·34	1·10	2·02	54·64
1898	11·74	20·92	17·68	0·65	1·23	52·22
1899	12·18	21·92	16·74	0·26	1·38	52·48
1900	10·42	23·15	14·39	0·25	0·83	49·04
1901	12·83	28·92	17·22	0·40	1·36	60·78
1902	13·15	35·70	16·31	0·38	1·35	66·89
1903	13·82	33·46	16·26	0·25	1·16	64·95

PER MILE OPEN.

	£	£	£	£	£	£
1894	63·8	146·8	97·4	.....	15·9	323·9
1895	65·8	157·2	92·2	.....	15·8	331·0
1896	96·6	175·3	162·7	.....	20·0	454·6
1897	117·1	267·3	271·8	14·0	25·7	695·9
1898	181·5	323·5	273·3	10·0	19·0	807·3
1899	130·1	234·3	178·9	2·8	14·8	560·9
1900	135·1	300·0	186·5	3·3	10·8	635·7
1901	163·4	366·9	218·5	5·1	17·2	771·1
1902	182·1	494·5	225·9	5·3	18·7	926·5
1903	185·2	448·3	217·7	3·4	15·6	870·2

Interest returned on Capital.

The following is a statement of the average interest earned by the railways on the money invested in them, and affords a comparison with the interest paid on the public debt of the state :—

Year.	Interest returned on Capital.	Actual Rate of Interest payable on Outstanding Loans.	Average gain.
	per cent.	per cent.	per cent.
1894	3.12	4.09	*0.97
1895	5.45	4.57	0.88
1896	11.48	3.84	7.64
1897	9.05	3.61	5.44
1898	4.62	3.59	1.03
1899	4.55	3.54	1.01
1900	5.81	3.52	2.29
1901	4.35	3.52	0.83
1902	3.54	3.47	0.07
1903	3.75	3.48	0.27

* Average loss.

The railways of Western Australia have not only met working expenses during the past nine years, but have left a margin after making provision for the payment of interest on capital expenditure. In the construction of these railways, few engineering difficulties were met with, and the lines, which are of a light character, were constructed at a cheaper rate than those of any other state. This fact, together with the enormous increase in coaching and goods traffic, due to the development of the gold-fields, has been instrumental in securing such a favourable return.

Earnings and Expenses per Mile.

The gross earnings, expenditure, and net earnings per train mile for the last ten years are shown in the following table :—

Year.	Gross Earnings per train mile.	Expenditure per train mile.	Net Earnings per train mile.
	d.	d.	d.
1894	52.59	38.92	13.67
1895	71.22	43.80	27.42
1896	82.44	41.05	41.39
1897	86.59	54.64	31.95
1898	67.72	52.22	15.50
1899	74.01	52.48	21.53
1900	71.70	49.04	22.66
1901	78.74	60.78	17.96
1902	81.00	66.89	14.11
1903	80.85	64.95	15.90

The gross earnings, expenditure, and net earnings per average mile open for the past ten years were as follow :—

Year.	Gross Earnings per average mile open.	Expenditure per average mile open.	Net Earnings per average mile open.
	£	£	£
1894	438	324	114
1895	538	331	207
1896	913	454	459
1897	1,103	696	407
1898	1,047	807	240
1899	791	561	230
1900	930	636	294
1901	999	771	228
1902	1,122	927	195
1903	1,083	870	213

While the gross earnings per train mile have increased from 52·59d. in 1894 to 80·85d. in 1903, the net earnings also show a slight improvement during the period, having risen from 13·67d. in the former year to 15·90d. in the latter. The causes that have led up to this have already been indicated. It will be observed that the expenses per train mile for 1902 are the highest for the period. From 1898 to 1900 a reduction was secured by the adoption of mixed trains. The volume of coaching and goods traffic carried during 1898 was larger than in previous years, but the net earnings per average mile open show a marked reduction. The increased traffic, of course, necessitated extra expenditure; and being accompanied by a reduction in rates, had the temporary effect of reducing the net earnings. It is estimated that the adoption of the new rates, as compared with the old, involved a loss during 1898 of at least £232,000 in the working of the Northam, Southern Cross, Coolgardie, and Kalgoorlie railways, but the wisdom of the railway policy of the country was justified by the results of the following two years. The abnormal rise in the expenditure for 1901 has already been explained.

Coaching and Goods Traffic.

The following table shows the number of passengers carried on the lines of the state during the year 1887, the earliest for which particulars are available, and for the last ten years, together with the receipts from the traffic, and the average receipts per journey :—

Year.	Passengers carried.	Receipts from Coaching Traffic.	Average Receipts per Journey.
		£	d.
1887	No. 173,656	19,032	26·29
1894	617,080	64,409	25·05
1895	1,022,248	122,051	28·65
1896	1,679,816	188,765	26·97
1897	3,607,486	410,750	27·33
1898	5,669,444	458,402	19·41
1899	5,872,200	364,687	14·90
1900	6,225,068	402,500	15·52
1901	6,823,453	407,319	14·33
1902	8,158,299	430,093	12·65
1903	9,106,396	437,232	11·52

The statement shows a large increase in the number of passengers carried each year; the gradual reduction in the average receipts per journey indicates the expansion of the suburban and local traffic.

The amount of goods tonnage for a similar period is shown in the following table :—

Year.	Tonnage of Goods.	Earnings.
1887	52,151	£20,380
1894	204,686	76,155
1895	255,839	173,949
1896	435,855	340,850
1897	858,748	494,733
1898	1,203,911	561,275
1899	1,132,246	639,933
1900	1,384,040	857,012
1901	1,719,720	946,385
1902	2,040,092	970,684
1903	1,968,331	983,877

It will be seen that the increase in the goods traffic has been considerable since 1897, while the tonnage in 1902 was nearly two and a half times that of 1897. Owing to reduction in the charges for carriage, the earnings have not shown so considerable an expansion.

TASMANIA.

The progress of railway construction in Tasmania has been somewhat slow, for owing to the fact that the island is small and possesses numerous harbours, the railways have had to face severe competition with sea-borne traffic. As stated earlier in the chapter, the line from Launceston to

Deloraine, 45 miles in length, was opened on 10th February, 1871, and though an agitation long existed for the construction of a railway between the principal centres, Hobart and Launceston, it was not till the 1st November, 1876, that it was opened for traffic. No further extension was carried out until 1884, when an increase of 48 miles was made, and up to 1890 the total mileage opened was only 398, of which 48, opened in 1884, were constructed by a private company. The length of state railways opened to 31st December, 1902, was 461 $\frac{3}{4}$ miles, at a cost of £3,840,747 for construction and equipment, or at the rate of £8,302 per mile.

The lines of state railway in operation in Tasmania are the Western, from Launceston to Burnie, with branch to Chudleigh; the Main line from Hobart to Launceston, with branches from Launceston to Scottsdale, Parattah to Oatlands, Conara Junction to St. Mary's, Bridgewater to Glenora, and Brighton Junction to Apsley; the Sorell line, from Bellerive to Sorell; and the West Coast line, from Strahan Wharf to Maestris.

The control of the railways is vested in the Department of Lands and Works, the active management being undertaken by an officer with the title of General Manager.

Revenue and Working Expenses.

The net sum available to meet interest charges in connection with the railways of the state for each of the years during the last decennial period was as follows:—

Year.	Gross Earnings.	Working Expenses.	Net Earnings.	Proportion of Working Expenses to Gross Earnings.
	£	£	£	£
1893	152,083	136,468	15,615	89·73
1894	144,488	122,850	21,638	85·02
1895	149,642	120,351	29,291	80·42
1896	162,932	122,171	40,761	74·98
1897	166,834	128,544	38,290	77·04
1898	178,180	141,179	37,001	79·23
1899	193,158	152,798	40,360	79·10
1900	202,959	160,487	42,472	79·07
1901	205,791	173,400	32,391	84·26
1902	233,210	173,292	59,918	74·31

The cost of working the Tasmanian railways is comparatively high, and, as in New Zealand, the lines have to face severe competition with sea-borne traffic while there are no large inland centres that could support railways. There is a marked decrease year by year in the Australian traffic *via* Launceston, which is attributed to the great improvement in the direct steamer service between Melbourne and Hobart

The following analysis of the working expenses of Tasmanian railways for the ten years 1893-1902 does not call for special comment. There has, of late years, been a slight upward tendency in the cost of train mileage, partly due to the increased price of coal. In the years 1895, 1896 and 1897 it is evident that necessary expenditure on rolling stock was not carried out, thus throwing the burthen of repairs on to later years—this was especially the case in regard to locomotive repairs. In 1901 there were extensive renewals of locomotive boilers, but a portion of the expenditure in connection therewith might have been saved by earlier attention:—

Year ended 31st December.	Maintenance of Way, Works, and Buildings.	Locomotive Power, Carriage and Waggon Repairs and Renewals.	Traffic Expenses.	General Charges.	Total.
	£	£	£	£	£
1893.....	50,191	48,623	31,152	6,502	136,468
1894.....	44,762	42,483	29,507	6,098	122,850
1895.....	46,548	38,381	29,424	5,998	120,351
1896.....	46,813	38,326	30,909	6,123	122,171
1897.....	48,561	40,683	32,989	6,311	128,544
1898.....	54,927	45,180	33,765	7,307	141,179
1899.....	56,238	51,662	37,370	7,528	152,798
1900.....	58,862	53,865	39,300	8,460	160,487
1901.....	59,897	63,580	41,138	8,785	173,400
1902.....	58,612	63,791	42,416	8,473	173,292

PER TRAIN MILE.

	d.	d.	d.	d.	d.
1893.....	15·1	14·6	9·3	1·9	40·9
1894.....	14·2	13·5	9·3	1·9	38·9
1895.....	15·4	12·6	9·7	2·0	39·7
1896.....	15·2	12·4	10·0	2·0	39·6
1897.....	15·2	12·8	10·3	2·0	40·3
1898.....	17·3	14·2	10·7	2·3	44·5
1899.....	16·7	15·4	11·1	2·2	45·4
1900.....	17·3	15·8	11·6	2·5	47·2
1901.....	16·1	17·0	11·0	2·3	46·4
1902.....	15·6	16·9	11·2	2·3	46·0

PER MILE OPEN.

	£	£	£	£	£
1893.....	117·5	113·8	72·9	15·2	319·4
1894.....	104·8	99·4	69·0	14·3	287·5
1895.....	109·0	89·8	68·8	14·0	281·6
1896.....	109·6	89·7	72·3	14·3	285·9
1897.....	112·4	94·1	76·3	14·5	297·3
1898.....	123·3	101·5	75·8	16·4	317·0
1899.....	126·3	116·0	83·9	16·9	343·1
1900.....	132·1	120·9	88·2	19·0	360·2
1901.....	130·3	138·4	89·5	19·1	377·3
1902.....	125·2	136·3	90·6	18·1	370·2

Interest returned on Capital.

The following table shows the average loss on the working of the Tasmanian railways for each year during the last ten years :—

Year.	Interest returned on Capital.	Actual rate of Interest payable on Outstanding Loans.	Average Loss.
	per cent.	per cent.	per cent.
1893	0·44	4·11	3·67
1894	0·61	3·96	3·35
1895	0·83	3·88	3·05
1896	1·16	3·87	2·71
1897	1·09	3·85	2·76
1898	1·03	3·82	2·79
1899	1·12	3·81	2·69
1900	1·16	3·78	2·62
1901	0·85	3·76	2·91
1902	1·56	3·76	2·20

The foregoing table shows that there was a slight improvement in the condition of the railway revenue during the five years preceding 1901. During 1901 the interest returned on capital expenditure fell to nearly that of the year 1895. Among the causes leading to this was the reduction in passenger fares, in the case of single fares by 45 per cent., and return fares by $27\frac{1}{2}$ per cent. These large reductions did not result in the fulfilment of anticipations, and on the 1st December, 1901, a revised scale was adopted, which is still 20 per cent. below that in force in 1900. The competition of the Emu Bay Company and the low prices ruling for lead and silver have brought about a decrease in revenue on the Government West Coast line. Working expenses have absorbed 84·26 per cent. of total revenue, and the large increase over the previous five years is due to increased mileage, more extensive renewals of locomotive boilers paid for out of working expenses, and the increased price of coal. The competition already referred to, together with the heavy initial cost of the railways themselves, especially of the main line connecting Hobart with Launceston, for which the price paid by the Government on its resumption was at the rate of £9,069 per mile, as against an average of £8,304 per mile for the lines of the state generally, render it extremely difficult, even with the most careful management, to effect any considerable diminution in the average loss. Even in the case of the Western line from Launceston to Burnie, which passes through the finest agricultural land in the state, the return, after paying working expenses for the year ended 31st December, 1902, was only 2·69 per cent. on the cost of construction and equipment. The returns for the year ended 31st December, 1902, however, show a

considerable improvement on those of the previous year, the gross and net earnings being the highest for the decennial period.

Earnings and Expenses per Mile.

The following tables indicate the gross earnings, expenditure, and net earnings per train mile and per average mile of line open. It will be observed that the net earnings per train mile reached 15d. in 1902, a point beyond which it does not seem likely there will be much expansion. The considerable reduction in net earnings during 1901, in comparison with the previous five years, is due to the shrinkage of revenue consequent on the reduction of fares, and the contraction in revenue from goods traffic already referred to. This compares very unfavourably with the results for other parts of Australia.

Year.	Gross Earnings per train mile.	Expenditure per train mile.	Net Earnings. per train mile.
	d.	d.	d.
1893	45·63	40·94	4·69
1894	45·83	38·96	6·87
1895	49·36	39·69	9·67
1896	52·85	39·63	13·22
1897	52·34	40·33	12·01
1898	56·17	44·50	11·67
1899	57·50	45·49	12·01
1900	59·70	47·20	12·50
1901	55·14	46·46	8·68
1902	61·99	46·06	15·93

The earnings and expenditure per average mile open were as shown in the following statement:—

Year.	Gross Earnings per average mile open.	Expenditure per average mile open.	Net Earnings per average mile open.
	£	£	£
1892	424	387	37
1893	356	319	37
1894	338	287	51
1895	350	281	69
1896	381	286	95
1897	386	297	89
1898	400	317	83
1899	434	343	91
1900	456	360	96
1901	448	377	71
1902	498	370	128

The peculiar position of Tasmania has already been referred to. The portions of the lines at first constructed were within the more densely populated districts, and the later extensions were projected into the more thinly-peopled areas, which were without sufficient production to afford a payable traffic. In comparison with the other states the proportion of expenses to gross earnings is extremely high, and while for the five years ended 1900 an improvement was shown, the increase in 1901 and 1902 indicates that it is not possible under present conditions to reduce expenditure.

Coaching and Goods Traffic.

Particulars in respect of the number of passengers carried on the state lines of Tasmania during the year 1881, and for the last ten years, together with receipts from the traffic and the average receipts per journey, are set forth in the following table:—

Year.	Passengers carried.	Receipts from Coaching Traffic.	Average Receipts per Journey.
	No.	£	d.
1881	102,495	10,396	24·34
1893	546,671	64,428	28·28
1894	514,461	58,070	27·09
1895	526,814	57,947	26·39
1896	542,825	59,771	26·43
1897	603,530	62,447	24·88
1898	617,643	68,317	26·54
1899	640,587	73,147	27·40
1900	683,015	76,184	26·77
1901	777,445	78,328	24·18
1902	761,345	99,115	31·25

During the year 1892 there was a comparatively large number of passengers carried. This was due to the resumption of the main line connecting Hobart with Launceston, the returns for the years in question being swollen by the traffic over the increased length of line. The traffic, however, was not sustained, for in the subsequent year a large diminution in the number of persons making use of the lines was recorded. There has since been a revival, and there are good grounds for supposing that this improvement will be continued. The average receipts per journey do not vary to any considerable extent, the amount of suburban traffic properly so-called being very small. The fall in 1901 is largely due to the considerable reduction in fares already alluded to. A reaction, however, set in during 1902, and the average receipts per journey for that year are the highest during the decennial period.

The amount of goods tonnage for a similar period is shown in the following table :—

Year.	Tonnage of Goods and Live Stock.	Earnings. £
1881	21,043	8,332
1893	164,982	73,490
1894	174,457	73,639
1895	204,480	78,797
1896	229,707	85,780
1897	229,620	86,941
1898	235,096	93,620
1899	312,446	107,661
1900	308,453	111,904
1901	314,628	108,698
1902	407,505	134,096

No information is available showing the subdivision of the tonnage of goods and live stock for the year into a general classification. The average distance each ton of goods was carried was 35·30 miles, and the average receipts per ton per mile 1·82d.

NEW ZEALAND.

The continuance of the native war in New Zealand, militated against the rapid extension of the railways, and at the close of the war in 1870 there were only 46 miles in operation. In 1875 the length of line opened for traffic had increased to 542 miles; in 1885, to 1,613 miles; in 1890, to 1,842 miles; and in 1895 to 2,014 miles. The length of line opened to 31st March, 1903, was 2,291 miles, at a cost of £19,081,735 for construction and equipment, or at the rate of £8,329 per mile.

The railway system of the colony is divided into ten sections. The Kawakawa and Whangarei sections, in the extreme north of the North Island, are short lines to coal-fields, and the Kaihu section was built for the purpose of tapping large timber areas inland. The Auckland section forms the northern portion of the North Island main trunk railway, which, when complete, will terminate at Wellington, on the shores of Cook's Strait. The Wellington-Napier-New Plymouth section comprises the group of lines which serve the southern portion of North Island. In the northern portion of Middle Island, the Westland, Westport, Nelson, and Picton sections form only the first link in the chain of through communication. On the East Coast of Middle Island, the actual working portion of the main trunk line is to be found. The present terminus is at Culverden, from whence extension will be made northward. This is known as the Hurunui-Bluff section, and includes the service to Christchurch, Dunedin, Invercargill, and the Bluff.

During the year ended March, 1901, the whole of the Midland railways were formally taken possession of by the Government and incorporated with the Westland section of the Government railways. They had previously been worked by the Government as a trust. The total length of these lines was about 83 miles.

The management of the railways of New Zealand was placed in the hands of three Commissioners in 1887, but early in 1895 the Government resumed charge of the lines, the active control being vested in an officer with the title of General Manager, who is responsible to the Minister for Railways.

Revenue and Working Expenses.

The net sum available to meet interest charges during each year of the last decennial period is set forth in the following table:—

Year.	Gross Earnings.	Working Expenses.	Net Earnings.	Proportion of Working Expenses to Gross Earnings.
	£	£	£	£
1894	1,172,793	735,360	437,433	62·70
1895	1,150,851	732,161	418,690	63·62
1896	1,183,041	751,368	431,673	63·51
1897	1,286,158	789,054	497,104	61·35
1898	1,376,008	857,191	518,817	62·30
1899	1,469,665	929,738	539,927	63·26
1900	1,623,891	1,052,358	571,533	64·80
1901	1,727,236	1,127,848	599,388	65·30
1902	1,874,586	1,252,237	622,349	66·80
1903	1,974,038	1,343,415	630,623	68·05

The foregoing table shows that the serious fluctuations which at times characterise the returns of the states on the mainland of Australia are absent from those of New Zealand, the configuration of the islands and their higher latitude rendering them to a very great extent immune from the periodical droughts to which the Australian states are so subject. The proportion of working expenses to gross earnings does not vary to any considerable extent, and the rise during the past four years is attributed to the payment of an increased rate of wages to employees, replacing old engines with new, extensive repairs due to the increased age of the stock, and the relaying of a portion of the permanent way with heavier rails. The traffic has, in many places, practically outgrown the carrying capacity of the lines, which were originally intended as the pioneers of settlement, and were not built to cope with a business such as exists in many parts of the colony. The management urges the employment of the heaviest type of locomotive as a matter of the utmost importance in the interests of economy, together with the running of trains at frequent intervals and higher speeds. There are, however, considerable portions of main line still laid with light rails, and until such time as these can be replaced with rails of a heavier type, and the bridges strengthened to carry the heavier class of engine, it is impossible to obtain the best results of working.

The analysis of the working expenses of the New Zealand railways for the ten years, 1894-1903, which is here presented, shows that there

has been a regular increase since 1895, in which year the expenditure amounted to £732,161, equal to 54·54d. per train mile compared with 59·23d. per train mile in 1903.

In 1902 the Minister for Railways drew attention to the increasing age of the lines, the necessity for employing heavier rolling stock, and the accelerated speed which render the efficient maintenance of the track an imperative necessity; if the Minister's ideas are fully carried out an increased expenditure may be looked for. The advance in the cost of working from £372 to £594 per mile of line open is of no significance, such expenditure being due merely to the continued growth of the traffic.

Year ended 31st March.	Maintenance of Way, Works, and Buildings.	Locomotive Power.	Carriage and Wagon Repairs and Renewals.	Traffic Expenses.	General Charges.	Total.
	£	£	£	£	£	£
1894	268,451	177,833	56,470	201,166	31,440	735,360
1895	272,718	175,758	50,949	201,641	31,095	732,161
1896	282,593	185,669	54,692	207,253	21,161	751,368
1897	301,981	190,543	65,825	213,914	16,791	789,054
1898	327,987	209,289	65,344	232,646	21,925	857,191
1899	357,189	231,532	73,680	244,932	22,405	929,738
1900	394,619	295,542	76,555	262,552	23,090	1,052,358
1901	426,405	293,383	91,532	296,159	20,369	1,127,848
1902	436,847	351,172	99,522	333,211	31,485	1,252,237
1903	460,398	378,575	105,976	360,061	38,405	1,343,415

PER TRAIN MILE.

	d.	d.	d.	d.	d.	d.
1894	20·70	13·71	4·35	15·51	2·42	56·65
1895	20·32	13·09	3·79	15·02	2·32	54·54
1896	20·51	13·47	3·97	15·04	1·54	54·55
1897	21·26	13·41	4·64	15·06	1·18	55·55
1898	21·47	13·70	4·27	15·23	1·44	56·11
1899	21·60	14·00	4·46	14·81	1·35	56·22
1900	22·61	16·93	4·39	15·05	1·33	60·31
1901	22·15	15·24	4·75	15·38	1·06	58·58
1902	20·69	16·64	4·71	15·79	1·49	59·32
1903	20·30	16·69	4·67	15·88	1·69	59·23

PER MILE OPEN.

	£	£	£	£	£	£
1894	140·35	92·96	29·52	105·15	16·43	384·41
1895	138·57	89·31	25·89	102·45	15·80	372·02
1896	141·45	92·93	27·37	103·74	10·59	376·08
1897	149·77	94·50	32·65	106·09	8·33	391·34
1898	160·53	102·43	31·98	113·86	10·73	419·53
1899	172·92	112·09	35·67	118·56	10·85	450·09
1900	187·99	140·80	36·47	125·08	11·00	501·34
1901	196·14	134·95	42·11	136·23	9·37	513·80
1902	196·17	157·69	44·69	149·63	14·14	562·32
1903	203·55	167·36	46·85	159·17	16·97	593·90

Interest Returned on Capital.

The basis employed in the case of the states comprised within the Commonwealth for ascertaining the net interest payable on the railway debts cannot be adopted for New Zealand, the necessary data not being available. The nominal loss is, therefore, shown in the following statement, the actual loss being somewhat higher:—

Year.	Interest Returned on Capital.	Average rate of Interest payable on Outstanding Loans.	Average Loss.
	per cent.	per cent.	per cent.
1894	2·88	4·59	1·71
1895	2·73	4·00	1·27
1896	2·80	3·94	1·14
1897	3·19	3·92	0·73
1898	3·24	3·89	0·65
1899	3·29	3·81	0·52
1900	3·42	3·79	0·37
1901	3·48	3·78	0·36
1902	3·43	3·76	0·33
1903	3·31	3·71	0·40

The foregoing table indicates that the railways are approaching the stage of being self-supporting, the interest returned on capital cost for the past nine years showing an improvement each year.

Earnings and Expenses per Mile.

The gross earnings, expenditure, and net earnings per train mile for the past ten years are shown in the following table:—

Year.	Gross Earnings per train mile.	Expenditure per train mile.	Net Earnings per train mile.
	d.	d.	d.
1894	90·25	56·69	33·56
1895	85·75	54·54	31·21
1896	85·75	54·53	31·22
1897	90·50	55·55	34·95
1898	90·00	56·11	33·89
1899	89·00	56·22	32·78
1900	93·00	60·31	32·69
1901	89·75	58·58	31·17
1902	88·80	59·32	29·48
1903	87·02	59·23	27·79

The gross earnings per train mile have varied very little during the ten years, the lowest point touched being 85½d., and the highest, 93d., while the expenditure has varied even less. The expenditure during 1900 was higher than in any other year during the decennial period. The gross earnings per train mile for the past three years were less than those of 1900, and the net earnings show a slight but gradual reduction

during the past six years. The results, however, compare very favourably with the other states, and are only exceeded by those of New South Wales, with the exception of the year just closed, when New Zealand showed a slightly higher net return.

The gross earnings, expenditure, and net earnings per average mile open for the past ten years are as follow :—

Year.	Gross Earnings per average mile open.	Expenditure per average mile open.	Net Earnings per average mile open.
	£	£	£
1894	613	384	229
1895	585	372	213
1896	592	376	216
1897	638	391	247
1898	673	419	254
1899	712	450	262
1900	774	501	273
1901	794	519	275
1902	842	562	280
1903	873	594	279

The foregoing table indicates that the gross earnings have increased from £613 per average mile open to £873, and the net earnings from £229 to £279, the return for 1902 being the highest secured during the decennial period, and that for 1903 being only £1 less—evidence of the fact that the extensions in recent years have been judicious, and that the volume of traffic has been maintained.

Coaching and Goods Traffic.

The following table shows the number of passengers carried on the lines of the colony during the year ended 31st March, 1882, and for the last ten years, together with the traffic, and the average receipts per journey :—

Year.	Passengers carried.	Receipts from Coaching traffic.	Average Receipts per Journey.
	No.	£	d.
1882	2,911,477	329,492	27·16
1894	3,972,701	378,480	22·89
1895	3,905,578	360,243	22·14
1896	4,162,426	359,822	20·74
1897	4,439,387	378,684	20·47
1898	4,672,264	399,262	20·51
1899	4,955,553	438,367	21·23
1900	5,468,284	474,793	20·83
1901	6,243,593	503,051	19·34
1902	7,356,136	575,697	18·78
1903	7,575,390	576,529	18·26

It will be observed that there was a falling off during the decennial period in the average receipts per journey. The continued increase in the number of passengers carried is, however, very marked, the advance

for the closing year of the period being upwards of 219,000, while the receipts from the traffic rose by £832. Taking the returns for the year ended 31st March, 1884, as a basis, it has been found that those for 1903 show an increase of only 37 per cent. in the number of passengers who travelled first-class, while the increase in those who travelled second-class was not less than 113 per cent. While the marked prosperity of the past four years has induced more passengers to travel first-class, it is none the less evident that the tendency is towards one class of carriage, as already exists in the case of tramways.

The amount of goods tonnage for a similar period is shown in the following table:—

Year.	Tonnage of Goods exclusive of Live Stock.	Earnings. £
1882.....	1,437,714	491,057
1894.....	2,060,645	686,469
1895.....	2,048,391	683,726
1896.....	2,087,798	698,115
1897.....	2,368,927	774,163
1898.....	2,518,367	837,590
1899.....	2,624,059	882,077
1900.....	3,127,874	985,723
1901.....	3,339,687	1,051,695
1902.....	3,529,177	1,110,575
1903.....	3,730,394	1,189,101

The large increase in the tonnage of goods carried during 1900 over preceding years was caused by the bountiful harvest in the Middle Island, which was carried at freight rates averaging 20 per cent. below those ruling in the previous year. The further increase of 211,813 tons for 1901 was contributed to by all descriptions of goods, with the exception of wool, the grain traffic alone being 84 per cent. higher than in 1899. The returns for 1902 show an advance of 189,490 tons over the traffic in 1901. Increases occur under all the various headings, the largest being in grain and timber, the traffic in each class, with the exception of wool, being the largest on record.

The subdivision of the tonnage of goods and live stock for the year ended 31st March, 1903, is shown in the following table. Particulars of the goods traffic are set forth in seven classes, but the average distance for which goods of each class were carried cannot be given, and there are no data available showing the average earnings per ton per mile.

Description of Traffic.	Tons carried.	Number carried.
Lime and Chaff	121,092	.....
Wool.....	116,309	.....
Firewood	100,498	.....
Timber.....	436,008	.....
Grain.....	718,376	.....
Merchandise	633,685	.....
Minerals	1,604,426	.....
Cattle.....	.....	102,461
Sheep.....	.....	3,821,333
Pigs.....	.....	61,844

TRAMWAYS.

In all the Australasian states tramways are in operation, but it is chiefly in Sydney and Melbourne, the inhabitants of which numbered at the latest date 508,510 and 502,610 respectively, that the density of settlement has necessitated the general adoption of this mode of transit.

In New South Wales the three systems of electric, cable, and steam traction are in vogue. Within the metropolitan area, however, the electric is being substituted for steam power. The length of line under electric traction on the 30th June, 1903, was 67 miles 69 chains, comprising 11 miles 68 chains at North Sydney; 4 miles 18 chains, Ocean-street, Woollahra, to South Head; 3 miles 36 chains, George-street—Harris-street tramway; 4 miles 11 chains, Glebe Junction to Newtown, Marrickville, and Dulwich Hill; 2 miles 73 chains, Forest Lodge Junction to Leichhardt; 2 miles 57½ chains, Newtown to St. Peters and Cook's River; 1 mile 63 chains, Railway to Bridge-street; 5 miles 55 chains, Waverley and Bondi; 2 miles 28 chains, Railway to Glebe and Forest Lodge; 3 miles 34 chains, Forest Lodge to Balmain; 1 mile 26 chains, Redfern to Moore Park; 3 miles 20 chains, Pitt and Castlereagh streets to Fort Macquarie; 55 chains, George-street to Miller's Point; 5 miles 33 chains, Randwick and Coogee; 1 mile 18 chains, Waverley to Randwick; 69 chains, Crown-street to Cleveland-street; 2 miles 12 chains, Drummoyne; 6 miles 66 chains, Railway Station junction to Botany; 1 mile 45 chains, Zetland; 1 mile 34 chains, Mitchell-road; and 48 chains, Bridge and Phillip streets to Circular Quay. The only line worked by cable traction is that from King-street, Sydney, to Ocean-street, in the suburb of Woollahra, a distance of 2 miles 32 chains. On the remaining lines steam motors are still used. The length of Government tram lines open to 30th June, 1903, was 124½ miles, which had cost for construction and equipment £3,371,587. The receipts for the year were £752,034, and the working expenses £654,165, leaving a profit of £97,869, or 2.90 per cent. on the invested capital. The number of passengers carried during 1903 was 130,405,402.

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 30th June, 1903, were £488,540. The number of passengers carried during the year was 47,564,942. The miles of track operated on were 43½ cable and 4½ horse lines, or 48 miles of double track. Besides the lines of the Tramway Trust, there are additional suburban systems worked by limited liability companies, as follows:—Horse, 8½ miles; electric, 4 miles; and cable, 2½ miles.

In Queensland there is a system of electric trams controlled by a private company. The only information available shows that the capital of the company is £750,000 fully paid up, and that there are also debentures to the amount of £400,000. Particulars as to receipts

and disbursements are not available, but the report presented to the shareholders in London during May, 1902, showed a net profit of £42,815 for the period from 20th November, 1900, to 31st December, 1901. The length of the tramways is 25 miles, or 43 miles of single line. The company owned seventy-nine electric cars, and during the year 1901, 16,183,801 passengers were carried.

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 the lines, nor of the returns therefrom. A proposal is under consideration for the substitution of electric traction on these lines.

The Western Australian Government owns a line of horse tramway on a 2-foot gauge between Roeburne and Cossack, a length of $8\frac{1}{2}$ miles, constructed at a cost of £24,022. For the year ended 30th June, 1903, the gross earnings were £2,211, and the working expenses £2,161, leaving the gain on working expenses at £50.

In Tasmania there is an electric tramway from Hobart railway station, about 9 miles in length, owned by a private company. The cost of construction and equipment was £90,000; and the company possesses 20 cars. For the year ended 31st December, 1902, the receipts amounted to £17,802, and the working expenses, to £12,900. The passengers carried during the twelve months numbered 1,848,104. There is also a steam system at Zeehan, 2 miles in length, constructed at a cost of £5,388. No information is available as to the receipts, but the working expenses for the year ended 31st December, 1901, were £1,848. The number of passengers carried during the twelve months ended 31st December, 1902, was 7,302.

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