SECTION XVII.

ROADS AND RAILWAYS.

§ 1. Roads and Bridges.

1. **Introduction.**—At the present time but few of the main roads in Australia have the importance which they at one time possessed, for originally they were the main arteries of traffic between the chief towns and ports and the interior, a function which has been greatly modified by the development of railways. Owing to the very limited opportunity for inland water carriage, and the great extent of the Commonwealth, roads are still the sole means by which traffic can be conducted throughout a large part of the interior. They moreover serve as feeders to the railways.

In the early days of colonisation main roads were constructed by convict labour, connecting the settled districts, such as Penrith, Parramatta, and Windsor, with the metropolis of Sydney, but the interior of the country was not open to access until the year 1815, when a track as far as Bathurst was completed under the direction of Governor Macquarie. The construction of this road greatly increased the area available for agricultural and pastoral pursuits by rendering accessible the rich and fertile plains in the vicinity of Bathurst. In the following years settlement spread to such an extent that it was impossible to keep pace in the matter of road-making with the demands of the settlers. For many years the authorities chiefly confined their attention to the maintenance and improvement of the main roads already constructed, and to extending them to the principal centres of settlement, and it was not until the period subsequent to the discovery of gold, when many new routes were opened and the amount of traffic largely increased, that the matter received serious attention at the hands of the State Governments. Most of the early bridges were constructed of stone, and many of them are still in existence. In later years, during the period immediately following the progress of settlement in the interior, bridges were usually constructed of wood, and these have since been replaced, after a life of about twenty-five years. Nearly all the bridges of recent date are of iron or steel. Some of the larger and more modern bridges are notable, being fine examples of engineering skill.

During the latter half of the nineteenth century great progress was made in all the States in the construction of roads and bridges, so that at the present time there is a considerable network of roads spreading over the occupied regions of the Commonwealth. There are still, however, in the less settled parts, especially in Queensland and Western Australia, vast areas of territory inaccessible by roads, and even in the more thickly populated parts of the Commonwealth new roads and deviations, many of an important character, are required in order to facilitate settlement on the land. At the present time the general policy adopted in the States is to construct necessary roads and bridges, often to serve as feeders to the railway systems by conveying the traffic from country districts to convenient stations along the line. Throughout the Commonwealth there are a number of stock routes provided with wells and places for watering stock. Particulars as to these routes in the several States are not generally available, except in the case of Western Australia. It is hoped in a future issue to afford fuller information, together with a map shewing these routes. In all the States the control, construction, and maintenance of roads and bridges have been, to a large extent, decentralised and placed in the hands of suitable local bodies.

2. Expenditure on Roads and Bridges.—Figures shewing the total expenditure on roads and bridges in the States are not available. The subjoined statement, however, gives the amounts of total loan expenditures by the State Governments up to the 30th June, 1908.

ROADS AND BRIDGES.—TOTAL LOAN EXPENDITURE IN EACH STATE AND IN THE COMMONWEALTH UP TO THE 30th JUNE, 1908.

State, etc. ...	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	C'wealth.
Expenditure	£1,801,943	£176,006	£972,608	£1,464,736	£166,818	£2,525,283	£7,107,394

The following table shews the annual expenditure from loans on roads and bridges by the central Governments in each State and in the Commonwealth during each financial year since 1901 :—

ROADS AND BRIDGES.—LOAN EXPENDITURE BY STATE GOVERNMENTS, 1902 TO 1908.

State.	1901-2.	1902-3.	1903-4.	1904-5.	1905-6.	1906-7.	1907-8.
	£	£	£	£	£	£	£
N.S.W. ...	150,777	73,471	47,812	59,019	28,666	11,162	1,690
Victoria ...	47,104	44,770	17,267	14,945	1,919	444	23
Queensland ...	...	1,333	...	...	...	...	...
S. Australia ...	185	200	78	...	...	...	...
W. Australia	740	...	...	...	712	15,613	7,956
Tasmania ...	77,536 [1]	55,687 [1]	39,037 [1]	55,303 [2]	57,536	75,399	94,443
C'wealth ...	276,342	175,461	104,194	129,267	88,833	102,618	104,112

1. For the calendar years 1901, 1902, and 1903 respectively.
2. For the eighteen months ended 30th June, 1905.

The two tables given above shew only a small proportion of the actual expenditure upon roads and bridges in the different States, for the reason that (*a*) there have been large expenditures from revenue, both by the central Governments and by local authorities, and (*b*) the State Governments have in many cases voted grants and subsidies on the amount of rates collected, and have issued loans to local authorities either for the express purpose of the construction of roads and bridges or for the general purpose of public works construction. Returns of expenditure, where available, are given below for each State. Although no revenue is now derived directly from roads and bridges, they are indirectly of great value to the community, forming, next to railways and public lands, the most considerable item of national property.

3. New South Wales.—The first Act dealing generally with the subject of roads in New South Wales was passed in 1833, and provided for the construction and improvement of roads and streets throughout the colony. The Governor was authorised to open up new roads, for the purpose of which land could be compulsorily acquired. Main roads were distinguished from parish roads; the former, which were specified in a schedule, were to be maintained and repaired at the public expense, while the latter, which were situated mainly in the County of Cumberland, were to be maintained at the expense of the parishes. The Governor was also authorised to appoint Commissioners to report periodically upon the state of repair of the roads. In 1855 an Act was passed by the New South Wales Government requiring the footways in George and Pitt Streets in Sydney to be paved by the owners of the properties abutting on to those streets. Two years later the Roads Department was created to take over the control, construction, and mainten-

ance of roads and bridges in New South Wales. In the few years immediately following an improved system of road-making was adopted, and great progress is said to have been made in the repair of old roads and in the construction of new ones. The striking reduction in both the time of transit and cost of carriage is apparent in the following statement,[1] which indicates on the whole a saving of about 57 per cent. in time and 54 per cent. in cost.

NEW SOUTH WALES.—COMPARATIVE STATEMENT OF COST OF CARRIAGE OF GOODS BY ROAD AND TIME OF TRANSIT, 1857 TO 1864.

Main Road.	Distance.	1857.		1864.	
		Time of Transit.	Cost per Ton.	Time of Transit.	Cost per Ton.
	Miles.	Days.	£ s. d.	Days.	£ s. d.
Sydney to Goulburn ...	134	17½	12 5 0	7½	3 15 0
Sydney to Bathurst ...	145	23½	15 10 0	11	6 10 0
Newcastle to Murrurundi ...	119	21	9 0 0	8	6 10 0

Since 1864 the cost of carriage by road, however, has not been further reduced, and the control of roads and bridges, with the exception of municipal roads and certain roads in the vicinity of Sydney, constructed by private road trusts, remained in the hands of the central Government until the year 1906.

(i.) *Administration and Control.* The control of all roads, bridges, and ferries is now regulated by the Local Government Act 1906, which came into force on the 1st January, 1907 (see Section XXVI hereinafter). Under the provisions of this Act the eastern and central divisions of the State are divided into shires and municipalities for the general purposes of local government, for the endowment of which a sum of not less than £150,000 is payable annually out of the consolidated revenue on the basis of a percentage subsidy on the proceeds of the general rates received by the District Councils. The control of all roads, bridges, and ferries (except those proclaimed "National") has been transferred from the Roads Department to the respective shire and municipal councils, who are now responsible for their construction and maintenance. Power is given to construct new roads, to widen or close existing roads, to make by-laws for the regulation of traffic, etc.; in the case of the acquisition of land for the purpose of constructing new roads or of widening existing roads, the provisions of the Roads Act 1902 are incorporated.

(ii.) *Principal Main Roads.* The four principal main roads in New South Wales run in the same direction as, and are roughly contiguous to, the four State-owned main railway lines. (*a*) *The Southern Road*, 385 miles in length, runs from Sydney to Albury, and before the days of railway construction formed part of the highway over which the interstate traffic between Melbourne and Sydney used to flow. (*b*) *The South Coast Road*, 250 miles long, runs from Campbelltown along the top of the coast range and across the Illawarra district as far as Bega, from which place it extends as a minor road to the southern limits of the State. (*c*) *The Western Road*, 513 miles long, runs through Bathurst, Orange and many other important townships as far as Bourke, on the Darling River. (*d*) *The Northern Road*, 405 miles in length, runs from Morpeth, near Newcastle, as far as Maryland, on the Queensland border.

(iii.) *Length and Classfication of Roads and Bridges.* Owing to the alteration in the arrangements for the collection of statistics necessitated by the inauguration of the new system of local government, particulars as to the length of roads and streets for the year 1907 are not generally available. The following tables give the length of roads, the number of culverts, bridges, and ferries, from 1901 to 1906, inclusive:—

1. See Official Year Book, New South Wales, 1905-6, p. 156.

NEW SOUTH WALES.—LENGTH OF ROADS, NUMBER OF CULVERTS, BRIDGES, AND FERRIES, 1901 TO 1906.

Year.	Miles of Roads.	Number of Culverts under 20 ft. Span.	Number of Bridges over 20 ft. Span.	Number of Punts, Boats and Ferries.
1901	52,472	38,760	2,979	318
1902	53,908	39,082	3,251	331
1903	53,796	41,286	3,446	454
1904	53,892	41,286	3,446	454
1905	56,316	41,929	3,508	460
1906	58,326	43,564	3,548	457

NEW SOUTH WALES.—CLASSIFICATION OF ROADS ON THE 31st DECEMBER, 1906.

Classification.	Metalled, Wood-blocked, Ballasted, Gravelled or Corduroyed.	Formed.	Cleared or Drained.	Bush or Untouched Road.	Total
	Miles.	Miles.	Miles.	Miles.	Miles.
Scheduled (outside municipalities) ...	8,735	5,533	13,102	5,162	32,532
„ (within „) ...	734	117	198	42	1,091
Unclassified (outside „) ...	422	1,202	4,410	9,540	15,574
„ (within „) ...	58	34	57	49	198
*Roads under municipal councils ...	3,417	1,767	1,926	1,821	8,931
Total roads in New South Wales ...	13,366	8,653	19,693	16,614	58,326

* Particulars given are to the end of 1907.

The more important bridges, numbering 256, have been proclaimed under the provisions of the Local Government Act as "National works," and these, together with the bridges, etc., in the Western Division, remain under the control of, and are maintained by, the Public Works Department.

(iv.) *Expenditure on Roads and Bridges.* The subjoined table shews the total expenditure up to the year 1900, and the annual expenditure for succeeding years to 1907, by the central Government and by road trusts:—

NEW SOUTH WALES.—TOTAL AND ANNUAL EXPENDITURE BY ROADS DEPARTMENT AND BY ROAD TRUSTS, 1901 TO 1907.

Year ended 30th June.	Expenditure by Roads Department.			Expenditure by Road Trusts.	Total Expenditure.
	Consolidated Revenue Fund.	Loans.	Total.		
From 1857	£	£	£	£	£
to 1900 ...	—	—	18,790,410	1,258,027	20,048,437
1901 ...	696,102	130,499	826,601	9,074	835,675
1902 ...	689,398	150,777	840,175	7,817	847,992
1903 ...	591,265	73,471	664,736	6,517	671,253
1904 ...	438,752	47,812	486,564	3,404	489,968
1905 ...	386,872	59,019	445,891	2,132	448,023
1906 ...	468,395	28,666	497,061	1,171	498,232
1907 ...	401,169	11,162	412,331	*	*
Total ...	3,671,953	501,406	22,963,769	†1,288,142	†23,839,580

* Not available. † Incomplete.

4. **Victoria.**—In Victoria a comprehensive system of local government, under which the control of roads and bridges is vested in District Councils, has been in force for many years. In the Imperial Act of Parliament, by which the State of Victoria was constituted a separate colony, there was a provision authorising the Governor to incorporate the inhabitants of each county to form districts for the purpose of local government, and to establish elective District Councils, with power to make by-laws for, *inter alia*, the proper control, construction and maintenance of roads and bridges, which were to be paid for partly out of local tolls and rates. In 1852 a committee was appointed by the Legislative Council to inquire into the state of repair of roads and bridges, and as to how the funds for their construction and repair might be best expended. On the report of this committee was based the first Victorian Act which dealt with local government in country districts. The report contained an interesting account of the state of the country at that time; it pointed out the urgency of providing suitable roads and bridges as an aid to settlement and development; it emphasised the importance of setting aside more adequate funds for the purpose, and directed attention to the deplorable state of the lines of internal communication. The committee recommended that main lines of roads should be constructed throughout the colony by means of grants from the public revenue, and that toll-gates should be erected on the roads when completed. The following were the lines which it was advised should be first formed as main roads:—(*a*) From Wodonga to Melbourne *via* Kilmore. (*b*) From Melbourne to the Murray River *via* Mount Alexander. (*c*) From Melbourne to Geelong. (*d*) From Melbourne to Portland *via* Bacchus Marsh. (*e*) From Melbourne to Gippsland *via* Brighton and Dandenong. (*f*) From Geelong to Westward, and (*g*) from Geelong to Colac. The committee further recommended the appointment of a Central Road Board to have exclusive powers as to making or improving any new or existing main line of road, and that the Governor should be empowered to declare any part of the colony to be a Road District under the control of an elective District Board of from five to nine members, who were to have power to construct and maintain any new parish or existing cross-road, for which purpose they should be empowered to levy rates. With some slight alterations these recommendations were embodied in the Roads Act of 1853, which established a Central Road Board for the whole State, with an inspector-general and staff, and which also provided for the erection of local road districts under the management of local boards. In 1859 municipalities were established in Victoria, and in 1863 the Roads Districts and Shires Act and the Municipal Corporations Act were passed; these Acts were amended from time to time until they were consolidated by the Local Government Act of 1890, which was in turn amended and consolidated by the Local Government Act of 1903 (see Section XXVI hereinafter).

(i.) *Administration and Control.* Under the provisions of the last-named Act the absolute property in all land proclaimed as a road, street or highway is vested in the Crown. The control, construction, and maintenance of all roads, streets, and bridges are in the hands of District or Municipal Councils, who are empowered to open new roads, and to close, divert, or increase the width of any existing street or road, provided that no new road less than one chain in width may be opened without the consent of the Minister. Power is also given under certain conditions to reduce the width of any existing road or street to a width of not less than one chain. Where land has been alienated from the Crown, and there is no road to any part of such land from the nearest highway, if the owners of such land desire to have a private road communicating with the highway they may apply to that effect in writing to the council, who may then purchase the necessary land, and may open a road not less than thirty-three feet wide, which road will thenceforth be a private road for the use of the persons who applied for the same. The councils are further empowered to make and repair streets, lanes, or passages on private property, or forming means of back access to private property, and may compel the owners of such property to pay the cost of so doing. Footways in front of houses or grounds may be kerbed, flagged, paved, or asphalted, and the owners of such houses or grounds must bear half the cost of so doing. The revenue of the councils is derived from rates which may be either general or extra. The councils are empowered to raise loans for the purpose of

making or opening new streets and roads, and for diverting, altering, or increasing the width of streets and roads, provided that the amount of such loan must not exceed ten times the average income of the council during the three years immediately preceding.

(ii.) *General and Local Government Expenditure.* The gross amount expended by the State Government of Victoria on roads and bridges was £7,756,345 up to the end of June, 1900; figures for succeeding years are given in the table below. The annual expenditure from ordinary revenue by municipalities is not returned separately, but is included in Public Works Construction and Maintenance; the subjoined table shews the cost from general revenue of municipalities of private streets, roads, etc., and also shews the amounts of municipal loan expenditure from 1901 to 1907, inclusive.

VICTORIA.—AMOUNTS EXPENDED BY GENERAL GOVERNMENT ON ROADS AND BRIDGES, AND AMOUNTS EXPENDED BY LOCAL AUTHORITIES ON THE FORMATION OF PRIVATE STREETS, ROADS, LANES, ETC., TOGETHER WITH AMOUNTS OF MUNICIPAL LOAN EXPENDITURE ON STREETS, ROADS, AND BRIDGES, 1901 to 1907.

Financial Year.[1]	Annual Expenditure by State Government.	Municipal Loan Expenditure.		Formation of Private Roads, Streets, Lanes, etc.[2]	
		Cities, Towns, and Boroughs.	Shires.	Cities, Towns, and Boroughs.	Shires.
	£	£	£	£	£
1901	72,890	16,844	12,928	18,829	4,521
1902	75,855	13,047	15,656	17,655	4,542
1903	69,200	13,540	12,696	15,279	4,028
1904	42,144	12,929	1,444	15,432	4,072
1905	30,393	21,515	2,560	21,593	2,083
1906	56,145	5,673	8,480	18,237	1,390
1907	43,119	21,137	7,495	25,244	3,052

1. The financial years of Melbourne and Geelong end on the 31st December and the 31st August respectively; those of all other municipalities on the 30th September.

2. Including the cost of flagging, asphalting footpaths, etc., but exclusive of loan expenditure.

The total amount spent by the State Government on roads and bridges up to the year 1901 was £7,756,345, bringing the total expenditure to the end of 1907 up to £8,146,091.

5. Queensland.—In Queensland the construction and maintenance of public roads are controlled under a system of local self-government, for the purposes of which the whole State is divided into (*a*) towns and (*b*) shires. The City of Brisbane was constituted a municipality about three months prior to the separation of Queensland from New South Wales in 1859, and a general system of local government was inaugurated in the State in 1878. At the present time the duties, rights, and responsibilities of the local authorities with regard to roads, streets, and bridges are regulated by the Local Authorities Act of 1902. The councils are invested with full powers to open, close, divert, or widen streets, roads, and bridges, and to make by-laws for the regulation of traffic, etc. The members of the councils are elected by the ratepayers, and with the aid of executive officers they undertake the supervision and control of all necessary constructions and improvements of roads and bridges within their district. The rates which the councils are empowered to levy are supplemented by Government grants. Separate returns as to the expenditure by towns and shires on roads and bridges are not available, the amounts being included in the returns of expenditure on public works, particulars as to which expenditure may be found in the Section of this book on *Local Government.*

6. South Australia.—In South Australia the construction of an extensive main road system was initiated by Sir Henry Young, who was Governor of the colony from 1848 to 1854, and this system provided the principal means of communication between the outlying country and the capital and port before the introduction of railways. By the District Councils Acts, 1887 to 1904, and the Municipal Corporations Acts, 1890 to 1903, a system of local self-government has been extended to all the settled parts of the State, which parts are divided into districts and municipalities under the control of councils. Under the provisions of these Acts and of the Roads Act of 1884 the councils are invested with full powers as to the opening and making of new streets and roads, and the diverting, altering, or increasing the width of existing roads; as to raising, lowering, or altering the ground or soil of any street or road; and as to the construction, purchase, and management of bridges, culverts, ferries, and jetties.

(i.) *Main Roads and District Roads.* All the roads in each district are classified either as main roads or as district roads. Both classes of roads are under the direct control either of Municipal Corporations or of District Councils, but in the case of main roads the expenditure on construction and maintenance is chiefly provided for by Government grants, which are paid into a main road fund, while the expenditure on district roads is paid for out of general rates, and out of subsidies on the amount of such rates, granted by the central Government. Under the Main Roads Act 1908, a number of roads were declared to be main roads.

The total estimated length of streets and roads in South Australia up to the 30th June, 1908, was as follows:—

Particulars.	Woodblocked.	Macadamised.	Other.	Total.
Miles	—	8,615	23,726	32,341

(ii.) *Expenditure by Corporations on Main and District Roads.* The following table shews the expenditure by municipal corporations on both main and district roads during each year from 1901 to 1907, inclusive:—

SOUTH AUSTRALIA.—EXPENDITURE BY CORPORATIONS ON STREETS, ROADS, AND BRIDGES, 1901 TO 1907.

Year.[1]	District Roads.			Main Roads Fund.			
	Total Receipts.	Expenditure.		Receipts.		Expenditure.	
		Construction.	Maintenance.	From Main Road Grants.	Total.	Construction.	Maintenance.
	£	£	£	£	£	£	£
1901 ...	148,872	4,906	50,628	7,403	8,738	159	7,745
1902 ...	159,753	11,671	46,980	5,470	7,249	117	6,580
1903 ...	155,857	3,005	52,539	5,458	6,986	...	6,433
1904[2]	158,540	10,235	50,769	5,116	6,559	85	6,109
1905 ...	162,850	17,475	43,245	6,125	8,420	419	7,320
1906 ...	166,097	14,521	48,901	7,028	8,144	192	7,291
1907 ...	154,918	5,697	47,024	6,815	7,506	681	6,703

1. Up to and including the year 1903 the financial year ended on the 31st December, but after that date ends on the 30th November. 2. For eleven months ended the 30th November.

(iii.) *Expenditure of District Councils on Main and District Roads.* The following table gives similar information with respect to main and district roads under the control of District Councils:—

SOUTH AUSTRALIA.—EXPENDITURE BY DISTRICT COUNCILS ON STREETS, ROADS, AND BRIDGES, 1901 TO 1907.

Year Ended 30th June.	District Roads.			Main Roads Fund.			
	Total Receipts.	Expenditure.		Receipts.		Expenditure.	
		Construction.	Maintenance.	From Main Road Grants.	Total.	Construction.	Maintenance.
	£	£	£	£	£	£	£
1901 ...	147,309	18,026	47,379	72,980	100,077	11,861	67,487
1902 ...	134,780	22,925	43,430	62,990	87,070	6,039	63,084
1903 ...	134,216	20,573	44,070	56,092	74,877	5,766	54,778
1904 ...	140,216	22,682	47,519	54,645	69,868	6,280	49,465
1905 ...	150,309	32,157	37,613	55,799	75,622	4,650	56,448
1906 ...	132,085	24,564	47,502	60,568	63,723	5,293	54,027
1907 ...	128,787	27,795	47,731	70,550	70,769	5,598	57,152

7. **Western Australia.**—In Western Australia the construction, maintenance, and management of roads and bridges throughout the State, except those within the boundaries of municipalities, are under the control of District Road Boards, constituted by the Roads Acts 1902 to 1904.

(i.) *District Roads and Bridges.* Under the provisions of these Acts any part of the State, not within a municipality, may be constituted by the Governor-in-Council into a Road District, under the control of a Board of seven members elected by the ratepayers. The Board is invested with full powers for controlling and managing all roads and bridges within the district, and is empowered to make by-laws for the general regulation of traffic, to control the weight of engines and machines permitted to cross any bridge or culvert, to regulate the speed limits of vehicles, lights to be carried by vehicles, the lighting of streets and roads, and the licensing of bicycles and motor cars. A District Road Board, may not, however, construct any road or street less than sixty-six feet wide without the consent of the Governor, nor any bridge or culvert at a greater cost than £100, except by the direction of the Minister. The construction of the more important bridges and culverts is generally carried out by the Government, the work, after completion, being handed over to the Road Board for maintenance. In case of land being required for the purpose of constructing a new street or road, or for widening an existing street or road, the provisions of the Public Works Act of 1902 are incorporated in the Roads Acts. A Board may levy general rates within its district not exceeding one shilling and sixpence in the £ on the annual ratable value, and, if valued on the basis of unimproved values of lands, the general rate must not exceed twopence half-penny in the £ on the capital unimproved value. Boards are also empowered to raise loans for the purpose of constructing new roads, but the amount of such loans must not be greater than ten times the average amount of general rates collected for two years. For the purpose of paying the interest on money borrowed a Board may levy a special rate not exceeding one shilling and sixpence in the £. District Road Boards may also exercise the powers of Drainage Boards under the provisions of the Land Drainage Act of 1900.

(ii.) *Municipal Streets, Roads, and Bridges.* As regards roads, streets, and bridges within municipalities, these are under the control of local authorities elected under the provisions of the Municipal Corporations Act 1906. The municipal councils are invested with full powers for making, maintaining, and managing all streets, roads, and bridges within the municipal area, and may request the Governor to declare any such land reserved, used, or by purchase or exchange acquired for a street or way, to be a public

highway, and on such request the Governor may, by notice in the *Gazette*, proclaim such highway absolutely dedicated to the public.

(iii.) *Stock Routes.* Although the road districts cover a considerable area, amounting in all to about one million square miles, there are still vast tracts of country in Western Australia inaccessible by road. For the purpose of travelling stock in the less settled parts of the State, stock-routes have been provided and placed under the control of the Public Works Department. These routes are six in number, and are as follows:—(*a*) *The Kimberley-De Grey Stock Route*, starting about twenty miles south of Derby, runs as far as Broome, and continues thence in a south-westerly direction to the De Grey River. The route is about 350 miles in length, and follows the sea-coast at a distance of from two to ten miles along that part known as the Ninety-mile Beach. There are forty wells, as a rule from ten to fifteen miles apart. (*b*) *The De Grey-Peak Hill Route* starts from Pardoo, the junction of the Kimberley-De Grey and De Grey-Mingenew routes, and runs alongside of the De Grey River for about 100 miles, when it turns south for another 100 miles as far as Nullagine. (*c*) *The De Grey-Mingenew Route* commences at Pardoo and runs in a south-westerly direction for about 250 miles to the Fortescue River, where it turns south and runs irregularly to Mingenew, on the Midland Railway. The route is over 900 miles long. There are about eighty wells, in addition to permanent pools in the river beds, no watering stations being more than about fifteen miles apart. (*d*) *The Fortescue-Cue Route* runs from the Fortescue River to Cue, and is about 400 miles long. (*e*) *The Peak Hill-Leonora Route* starts from the Murchison, at the termination of the De Grey-Peak Hill route, and runs in a south-easterly direction to Leonora; it is about 300 miles long and has about thirty wells. (*f*) *The Coolgardie-Eucla Route* is about 500 miles in length. In 1903 an artesian bore was put down at Madura by the Public Works Department, 2001 feet deep, with a flow of 70,000 gallons a day.

(iv.) *Length of Roads, Number of Bridges, and Expenditure on Roads and Bridges.* The following table gives particulars of the operations of the Road District Boards since the 1st January, 1903, when the Roads Act of 1902 (now amended by the Act of 1904) came into force:—

WESTERN AUSTRALIA.—PARTICULARS OF ROADS UNDER CONTROL OF DISTRICT ROAD BOARDS, 1904 to 1907.

Year ended the 30th June.	Area.	Revenue.				Expenditure.	Length of Roads.				No. of Bridges and Culverts.	
		From General Rates.	From Grants and Subsidies.	From other Sources.	Total.		Cleared only.	Formed only.	Metalled or otherwise Constructed.	Total.	Bridges.	Culverts.
	Sq. m.	£	£	£	£	£	Miles.	Miles	Miles.	Miles.	No.	No.
1904[1]	976,006	18,593	141,409	16,139	176,141	126,736	6,498	2,625	1,395	10,518	287	2,745
1905	975,802	23,558	90,475	11,547	125,580	122,091	8,268	2,864	1,813	12,945	319	3,272
1906	975,792	28,219	85,280	12,746	126,245	125,616	8,556[2]	3,970	1,952[2]	14,478[2]	443[3]	3,792[3]
1907	975,780	35,088	60,313	13,796	109,197	126,716	9,269[4]	3,878[5]	2,088[5]	15,235[4]	491[6]	3,961[6]

1. The returns given for 1904 cover a period of eighteen months, from the 1st January, 1903, to the 30th June, 1904. 2. Exclusive of four Boards which have not supplied the information. 3. Exclusive of three Boards which have not supplied the information. 4. Exclusive of six Boards. 5. Exclusive of seven Boards. 6. Exclusive of five Boards.

The following table gives similar information with reference to roads under the control of municipalities under the Municipal Institutions Act 1900 and 1904:—

WESTERN AUSTRALIA.—PARTICULARS OF STREETS, ROADS, AND BRIDGES UNDER THE CONTROL OF MUNICIPALITIES, 1901 to 1907.

Year ended the 31st October.	No. of Municipalities.	Length of Streets, Roads, and Bridges.					Revenue.		Expenditure.	
		Paved, M't'll'd or Gr'v'lld	Form'd only.	Clear'd only.	Not Clear'd	Total.	From Rates.	From Grants.	Works and Impr'v-ments.	Street Light'g and Wat'r'g
		Miles.	Miles.	Miles.	Miles.	Miles.	£	£	£	£
1901[1]	42	195	30	149	137	511	78,021	66,850	111,256	15,969
1902	44	265	52	221	249	787	94,894	81,436	125,721	19,434
1903	44	291	55	282	227	855	104,760	80,938	142,347	20,745
1904	43	325	64	252	260	901	119,110	90,868	187,747	23,361
1905	43	354	74	258	256	942	130,575	85,798	183,226	25,404
1906	45	396	79	275	292[2]	1,042	146,306	95,997	165,421	31,045
1907	47	441	84	304	262[3]	1,091	136,868	85,473	132,103	34,135

1. Returns incomplete, not having been furnished when asked for. 2. Exclusive of three municipalities, which have not supplied the information. 3. Exclusive of four municipalities.

8. **Tasmania.**—In 1869 a Roads Act was passed in Tasmania empowering the Governor-in-Council to declare any portion of the colony to be a road district under the control of a Road Trust consisting of from five to seven members elected by the landowners. The trustees were invested with full control of all cross and by roads, but could not construct any road less than sixty-six feet wide without the consent of the proprietors on each side. Under the provisions of the Main Roads Act 1880 the Minister of Lands and Works for the time being was appointed Commissioner of Main Roads, and was invested with the supervision of all main roads and bridges except those situated in municipalities, which were first constituted by the Rural Municipalities Act of 1858, and also excepting those within road districts under the Act of 1869. The trustees of road districts were appointed to act as Main Road Boards. In 1884 previous enactments were repealed and their provisions were amended and consolidated by the Roads Act of that year; under this Act Main Road Boards were established. In 1906 both Road Trusts and Main Road Boards were abolished by the Local Government Act, which, however, specially provided that the councils of all municipalities constituted under the Act shall exercise all powers conferred upon, and shall be liable to all the obligations imposed upon Road District Trusts and Main Road Boards by the Roads Act of 1884. The whole State, with the exception of Hobart and Launceston, is divided into municipal districts, each of which is under the control of a warden and councillors, and each of which is deemed to be a road district and a main road district for the purposes of the Roads Act 1884.

(i.) *Cross Roads.* Under the provisions of the Roads Act of 1884 the Governor-in-Council was empowered to declare from time to time by proclamation any part of the State to be a road district for the purpose of the Act, and any such district was to be under the control of a Road Trust, the members of which were elected by the landholders in the district. The trustees were empowered to construct, maintain, and regulate all cross-roads within their district, cross-roads being defined to comprise the following roads:—(*a*) Any road leading from one town to another. (*b*) Any road leading from a town or public bridge to a main road. (*c*) Any road leading from a town to a navigable river. (*d*) Any road which may be proclaimed by the Governor as a cross-road. (*e*) All streets within a town, excepting those in any town in any rural municipality, which were under the control of municipal councils. The annual expenditure of Road Trusts was provided for partly by rates which they were empowered to levy, and partly by Government grants.

(ii.) *Main Roads.* Under the Act of 1884 main roads were from time to time determined by Parliament, and the Minister for Lands and Works was *ex officio* Com-

missioner of Main Roads. The powers and duties of this officer have not been altered by the Local Government Act of 1906. Municipal Councils and Road District Trusts were constituted Main Road Boards for all main roads situate in or passing through their district, with the exception of the main road from Hobart to Launceston, and for all bridges except those specified in the schedule to the Act. The Commissioner or any Main Road Board, subject to the authority of the Governor-in-Council, might, after a main road had been declared by law, take land required for such road, and might open a new road through the same. All powers, duties, and functions conferred by the Act upon any Main Road Board could be exercised by the Commissioner in respect of the main road from Hobart to Launceston, the bridges specified in the schedule to the Act, and all main roads not situated in any main road district. The expenditure on main roads was provided for by funds voted by Parliament by means of Main Roads Maintenance Acts.

(iii.) *Roads and Bridges under the Land Act 1903.* It is provided by the Lands Act of 1903 that as soon as 500 acres of first-class agricultural land have been taken up in one locality, and in not less than five lots, the Governor shall, for the purpose of making roads, bridges, or drains in the vicinity of the land so taken up, raise a sum equal to ten shillings an acre for every acre so taken up, by the issue and sale of debenture stock chargeable on the Consolidated Revenue Fund. The Governor is authorised to raise in the same manner a sum of money not exceeding five shillings for every acre of second-class land sold, and not exceeding two shillings and sixpence for every acre of third-class land sold, for similar purposes. With respect to the sale of lands within any town, not being within a mining area, of a value of not less than £250, the Governor may, for the purpose of making streets, roads, or other improvements in the vicinity of the land so sold, raise a sum equal to ten shillings for every pound of the value of such land, by the issue and sale of debenture stock as above. Provision is also made for the Commissioner of Roads, or for such other person as the Governor may appoint, to purchase and take any lands which he may deem necessary for the purpose of constructing roads or other public works.

(iv.) *Mileage of Main and Other Roads and Expenditure of Main Road Boards and Road Trusts, 1901 to 1906.* The subjoined table gives particulars as to lengths of roads open and as to the expenditure of Main Road Boards and Road Trusts, during the years 1901 to 1906, inclusive. Returns for the year 1907 from municipal councils under the Local Government Act of 1906 are too incomplete for publication.

TASMANIA.—LENGTH OF ROADS AND EXPENDITURE OF MAIN ROAD BOARDS AND ROAD TRUSTS, 1901 TO 1906.

Year.	Main Road Boards.		District Road Trusts.			
	Mileage Maintained.	Expenditure.	Number of Trusts.	Miles under Control.	Receipts.	Expenditure.
	Miles.	£	No.	Miles.	£	£
1901	696	7,591	102	6,539	28,887	26,263
1902	765	7,661	102	6,732	29,944	27,579
1903	650¾	8,805	105	6,855	25,359	30,368
1904	650	6,954	104	7,045	29,638	29,459
1905	678	7,028	104	7,124	30,063	28,566
1906	678¾	8,025	105	7,272	31,791	31,633

§ 2. Railways.

(A) General.

1. Introduction.—Although it was early recognised that railway construction was essential to the proper development and settlement, and to the future commercial prosperity of a large country like Australia, ill supplied with navigable rivers, the progress made in opening up lines during the twenty years which followed the completion of the first line in 1855, was very slow. This was no doubt due partly to the difficulty of borrowing money at a reasonable rate of interest, owing to the depreciation of Australian securities in London, and partly to the sparseness of the population, which it was feared would not justify the necessary expenditure. In the vicinity of Sydney, also, the ranges of mountains in the districts near the coast had to be either traversed or pierced by tunnels at a considerable expenditure of time and money, thus retarding the expansion of the railway systems which have their starting point at that city. Since the year 1875, however, greater activity in the construction of railways has been manifested, and satisfactory progress has been made in all the States of the Commonwealth; the State Governments now fully recognise the great importance to the community of carrying on the work of construction, and of conducting the administration and management of the railways on businesslike principles, free from undue political influence, and yet with regard to the general development of the country.

2. Railway Communication in the Commonwealth.—In the eastern, south-eastern, and southern parts of Australia there now exists a considerable network of railway lines converging from the various agricultural, pastoral and mining districts towards the principal ports, which are themselves connected by systems of lines running roughly parallel to the coast. These are shewn on the accompanying map. In the east, lines radiating from Townsville, Rockhampton, Brisbane, and Sydney, extend inland in various directions for distances ranging up to over 600 miles; in the south-east there are numerous lines, those in Victoria converging towards Melbourne, while others in New South Wales have their terminus in Sydney; in the south there are three main lines, with numerous branches, running from Melbourne, while from Adelaide one main line, with several branches to the costal towns, runs inland in a northerly direction for a distance of nearly 700 miles, and another line runs in a south-easterly direction to various ports and meeting the main line from Melbourne on the border of South Australia and Victoria. In addition to these main lines and their numerous branches, there are extensive suburban systems in Melbourne and some of the other cities of Australia, a considerable portion of the suburban traffic in Sydney being conducted by means of electric tramways. All these lines which have just been referred to are connected together by the main interstate line, which permits of direct communication between the four capital towns—Brisbane, Sydney, Melbourne, and Adelaide—a distance from end to end of 1790¼ miles. The journey from Brisbane to Adelaide by rail occupies just over three days, including one stop of 8 hours 50 minutes at Sydney, and another of 3 hours 49 minutes at Melbourne; the distance between the capitals, and the times occupied are as follows:—

Brisbane to Sydney ...	... 725 miles	... 27 hours, 20 mins.
Sydney to Melbourne ...	... 582½ „	... 16 „ 51 „
Melbourne to Adelaide ...	... 482¾ „	... 17 „ 15 „

The longest railway journey which can be undertaken in Australia, on one continuous line of railway, is from Longreach in Queensland to Oodnadatta in South Australia, a total distance of 3303 miles. In Western Australia there is a connected system of main or trunk lines between the ports of the State and the agricultural, pastoral, and mining districts. From these main lines a number of branches have been constructed, opening up fresh agricultural areas to the ports and markets of the State. The majority

of such branch lines will, on being ultimately extended, form connections between main lines and thus provide short and convenient routes between principal centres. In the northern parts of Queensland and in the Northern Territory there are also a number of disconnected lines running inland from the more important ports. In Tasmania the principal towns are connected by a system of lines, and there are also, more especially in the western districts, several lines which have been constructed for the purpose of opening up mining districts.

3. **Mileage Open for Traffic.**—In all the States of the Commonwealth the principle that the control, construction, and maintenance of the railways should be in the hands of the Government has long been adhered to, excepting in cases presenting unusual circumstances. In various parts of the Commonwealth lines have been constructed and managed by private companies, but at the present time practically the whole of the railway traffic in the Commonwealth is in the hands of the various State Governments. A large proportion of the private lines which are at present running have been laid down for the purpose of opening up forest lands or mining districts, and are not generally used for the conveyance of passengers or the public conveyance of goods. (See *C. Private Railways*, hereinafter.)

(i.) *Mileage of Government and Private Lines, 1855 to 1908.* The subjoined table shews the mileage of both Government and private lines open for traffic (exclusive of sidings and cross-overs) in each State and also in the Commonwealth at suitable periods since the inauguration of railways in Australia in 1855 up to the year 1908. The figures from 1855 to 1881 are given as up to the end of the calendar year; later figures are as up to the end of the financial year ended on the 30th June, unless otherwise stated, excepting the mileages for private lines which are in all cases taken for the calendar year:—

GOVERNMENT AND PRIVATE RAILWAYS.—MILEAGE OPEN, 1855 to 1908.

State.	1855.	1861.	1871.	1881.	1890-1.	1900-1.	1906-7.	1907-8.‖
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
New South Wales	14	73	358	1,040	2,263	2,926	3,534	3,743½
Victoria ...	2½	114	276	1,247	2,763	3,238	3,396	3,443
Queensland ...	*	*	218	800	2,205	2,904	3,240	3,694¾
South Australia ...	†6¾	56	133	845	1,666	1,736	1,866	1,937½
Northern Territory	*	*	*	*	145½	145½	145½	145½
Western Australia	*	*	12	92	‡656	1,984	2,457	2,581½
Tasmania ...	*	*	45	168	‡425	§618	618	667¼
Commonwealth ...	23¼	243	1,042	4,192	10,123½	13,551½	15,256½	16,212¾

* No railways yet constructed. † To the 31st December. This line between Goolwa and Port Elliot was opened in 1854 as a horse tramway, but now forms part of the railway system. ‡ To the 31st December, 1891. § To the 31st December, 1901. ‖ The increase in this year's figures is largely due to the fact that more complete particulars of private railways have been procured.

It will be seen from the above table that the rate of construction up to the year 1871 was very slow, the average annual length of lines opened from 1861 to 1871 being only 80 miles for the whole Commonwealth. By the middle of the following decade, however, the principal mountain ranges had been crossed, and the work of construction could be proceeded with at a greater rate, and at a less cost per mile. The greatest period of activity was from 1881 to 1891, when the average annual length opened for traffic was 594 miles for the whole Commonwealth; the corresponding figures for the following periods from June, 1891, to June, 1901, and from June, 1901, to June, 1907, were 342 miles and 284 miles respectively. The increase shewn in the last financial year is to a great extent due to the fact that more complete particulars regarding private railways have been collected.

4. **Comparative Mileage of State-owned and Private Lines, 1908.**—The subjoined table shews for each State and for the Commonwealth (*a*) the length of lines owned by the respective State Governments, all of which lines are of course open for general use by the public, (*b*) the length of private lines available for general use by the public, and (*c*) the length not so available. The mileages specified in the case of State-owned lines are as up to the 30th June, 1908; those given for private lines are as up to the 31st December, 1908.

GOVERNMENT AND PRIVATE RAILWAYS.—COMPARATIVE MILEAGE OF STATE-OWNED LINES, OF PRIVATE LINES AVAILABLE FOR GENERAL TRAFFIC, AND OF PRIVATE LINES NOT SO AVAILABLE, 1908.

State.	State-owned Lines.	Private Lines available for General Traffic.	Total Open for General Traffic.	Private Lines used for Special Purposes only.	Total.
	Miles.	Miles.	Miles.	Miles.	Miles.
New South Wales	3,472½	144	3,616½	127	3,743½
Victoria... ...	3,396	14¼	3,410¼	32¾	3,443
Queensland ...	3,359	315	3,674	20¾	3,694¾
South Australia ...	1,879¼	...	1,879¼	58	1,937¼
Northern Territory	145½	...	145½	...	145½
Western Australia	1,943	277	2,220	361½	2,581½
Tasmania ...	463	165½	628½	38¾	667¼
Commonwealth	14,658¼	915¾	15,574	638¾	16,212¾

5. **Comparative Railway Facilities in Different States, 1908.**—The area of territory and the population per mile of line open to the public for general traffic (including both Government and private lines) on the 30th June, 1908, are shewn in the subjoined statement for each State and also for the Commonwealth:—

GOVERNMENT AND PRIVATE RAILWAYS.—COMPARISON OF RAILWAY FACILITIES IN DIFFERENT STATES, 1908.

State.	Population.	Area.	Per Mile of Line Open.	
			Population.	Area.
	Number.	Sq. miles.	Number.	Sq. miles.
New South Wales	1,578,331	310,372	436	85.8
Victoria	1,255,757	87,884	368	25.7
Queensland	551,936	670,500	150	182.5
South Australia	394,663	380,070	210	202.2
Northern Territory	3,600	523,620	25	3,598.7
Western Australia	265,556	975,920	119	439.6
Tasmania	180,398	26,215	287	41.8
Commonwealth ...	4,230,241	2,974,581	271	191.0

6. **Classification of Lines according to Gauge, 1908.**—The subjoined tables shew the total mileage, exclusive of sidings and cross-overs, of (i.) Government railways;

(ii.) Private railways open to the public for general traffic; and (iii.) Private lines used for special purposes, classified according to gauge. Particulars of Government railways are up to 30th June, 1908, and of private railways to the 31st December, 1908:—

GOVERNMENT AND PRIVATE RAILWAYS.—CLASSIFICATION ACCORDING TO GAUGE, 1908.

State.	Mileage Constructed to Different Gauges.					Total.
	5 ft. 3 in.	4 ft. 8½ in.	3 ft. 6 in.	2 ft. 6 in.	2 ft.	
GOVERNMENT RAILWAYS.						
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
New South Wales ...	...	3,472½	...	...	...	3,472½
Victoria	3,314½	...	...	81½	...	3,396
Queensland ...	...	...	3,359	...	...	3,359
South Australia ...	599¼	...	1,425½	...	...	2,024¾
Western Australia ...	...	...	1,943	...	...	1,943
Tasmania	...	...	439¾	...	23¼	463
Commonwealth ...	3,913¾	3,472½	7,167¼	81½	23¼	14,658¼
PRIVATE RAILWAYS OPEN FOR GENERAL TRAFFIC.						
New South Wales ...	45	63	36	...	...	144
Victoria	14¼	...	...	...	...	14¼
Queensland ...	...	...	263	...	52	315
South Australia ...	...	...	...	...	...	...
Western Australia ...	...	...	277	...	...	277
Tasmania	...	...	155½	...	10	165½
Commonwealth ...	59¼	63	731½	...	62	915¾
PRIVATE RAILWAYS FOR SPECIAL PURPOSES.						
New South Wales ...	...	123½	3½	...	...	127
Victoria	28¾	...	4	...	...	32¾
Queensland ...	...	...	16¾	...	4	20¾
South Australia ...	...	...	58	...	...	58
Western Australia ...	...	...	361½	...	...	361½
Tasmania	...	...	24½	...	14¼	38¾
Commonwealth ...	28¾	123½	468¼	...	18¼	638¾
TOTAL.						
New South Wales ...	45	3,659	39½	...	...	3,743½
Victoria	3,357½	...	4	81½	...	3,443
Queensland ...	...	...	3,638¾	...	56	3,694¾
South Australia ...	599¼	...	1,483½	...	...	2,082¾
Western Australia ...	...	...	2,581½	...	...	2,581½
Tasmania	...	...	619¾	...	47½	667¼
Commonwealth ...	4,001¾	3,659	8,367	81½	103½	16,212¾

(B). Government Railways.

1. **Mileage Open, 1901 to 1908.**—The following table shews the length of Government railways open for traffic on the 30th June in each year since the inception of the Commonwealth:—

GOVERNMENT RAILWAYS.—MILEAGE OPEN FOR TRAFFIC ON THE 30th JUNE IN EACH YEAR FROM 1901 to 1908, INCLUSIVE.

State.	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
N.S.W. ...	2,845½	3,026	3,138½	3,281	3,281	3,390	3,453	3,472½
Victoria ...	3,237	3,302	3,383	3,381	3,394	3,394	3,396	3,396
Queensland	2,801	2,801	2,711	2,928	3,092	3,137	3,137	3,359
S. Australia	1,736	1,736	1,736	1,736	1,745½	1,745½	1,832	1,879¼
N. Territory	145½	145½	145½	145½	145½	145½	145½	145½
W. Australia	1,355	1,360	1,516	1,541	1,605	1,611½	1,764	1,943
Tasmania ...	*457½	*462	*462	462	462½	462½	462½	463
C'wealth ...	12,577½	12,832½	13,092	13,474½	13,725½	13,886	14,190	14,658¼

* To the 31st December.

The following statement shews the annual average increase in mileage opened since 1901 in each State:—

State	N.S.W.	Vic.	Qld.	S.A.	N.T.	W.A.	Tas.	Cwlth.
Average annual mileage opened	78⅜	19⅞	69¾	17⅞	...	73½	¾	260⅛

2. **Non-conformity of Gauge.**—With but few exceptions all the railway lines in the Commonwealth open for general traffic are now owned and managed by the respective States in whose territory they run, but, unfortunately for the purpose of interstate traffic, the construction of the various systems in different parts of Australia has proceeded without uniformity of gauge. In 1846 Mr. Gladstone, then Colonial Secretary, recommended in a despatch to the Governor of New South Wales that the 4 ft. 8½ in. gauge should be adopted. In 1850, however, the engineer to the Sydney Railroad and Tramway Company strongly advocated the adoption of the 5 ft. 3 in. gauge, and in 1852 an Act was passed making it compulsory that all railways in New South Wales should be constructed to the wider gauge, the Governors of Victoria and South Australia being duly advised of the step that had been taken. But in 1852 the company mentioned, having changed their engineer, also changed their views as to the gauge question, and in the following year they succeeded in obtaining the repeal of the Act of 1852 and in passing another, under the provisions of which the narrower gauge was made imperative. This step was taken without the concurrence of the other States concerned, and a considerable amount of ill-feeling arose, especially in Victoria, where two private companies had already placed large orders for rolling stock constructed to the broad gauge originally chosen. The result was that it was decided in Victoria to adhere to the 5 ft. 3 in. gauge as the standard gauge for that State, while the Sydney Railroad and Tramway Company proceeded with the construction of their lines to the 4 ft. 8½ in. gauge, and these two gauges have since been adhered to as the standard gauges of the respective States. The Queensland Government had at the outset adopted a gauge of 3 ft. 6 in. as being best suited to the requirements of the colony, and have since adhered to that gauge through-

out the State, so that all goods have to be discharged and reloaded at the boundary between that State and New South Wales. In South Australia the broad gauge of Victoria was at first adopted, and the part of the interstate line between Adelaide and the Victorian boundary was constructed to that gauge, so that the line from Melbourne to Adelaide is uniform. In the lines which have been constructed more recently, however, and in the Northern Territory, the South Australian Government has, with a view to economy in construction, adopted a gauge of 3 ft. 6 in. In Western Australia and Tasmania the 3 ft. 6 in. gauge was also adopted. It was recognised in both these States that the construction of railways was essential to their proper development, but as their financial resources would not bear a heavy initial expenditure in connection with the establishment of railway lines, it was decided to adopt the narrow gauge. In Victoria light railways have been constructed in recent years to a gauge of 2 ft. 6 in., whilst in Tasmania short lengths have been laid down to a 2 ft. gauge.

3. **Interstate Communication.**—Until the railway systems of the eastern States were connected at the common boundaries the inconvenience of non-conformity of gauge was not felt. Since then, however, the necessary transhipments of both passengers and goods have been a source of trouble, delay, and expense. On the 14th June, 1883, a railway bridge over the River Murray at Wodonga was opened for traffic, and communication was then established between Melbourne and Sydney; on the 19th January, 1887, the last section of the Victorian line to Serviceton, on the South Australian border, was completed, and a junction was thus effected with the South Australian line to Adelaide. On the 16th January, 1888, a junction was effected between the New South Wales and Queensland lines at Wallangarra, but there was still a break in the line from Sydney at the Hawkesbury River, thirty-six miles from Sydney. This last link was, however, completed on the 1st May, 1889, by the opening of the Hawkesbury River bridge, 2900 feet in length, and railway communication was thus established between the four capital cities, Brisbane, Sydney, Melbourne, and Adelaide.

4. **Unification of Gauge.**—The development of the railway systems of the Commonwealth has shewn that the adoption of different gauges on the main lines in the several States was a serious error. The extra cost, delay, and inconvenience incurred by the necessity of transferring through-passengers and goods at places where there are breaks of gauge, though not at present of any appreciable magnitude, are becoming more serious as the volume of business increases. As an indication of the extra cost thus involved the following junction charges payable on interstate traffic between New South Wales and Victoria and *vice-versa* are given :—

General Merchandise. 1st to 3rd Classes.	Special and Miscellaneous Class.	Small Consignments.	Live Stock.
3s. 6d. per ton	2s. 6d. per ton	1s. 6d. each	3s. per truck.

Although the cost of alteration to a uniform gauge would be great, many propositions have from time to time been put forward with the object of securing such a gauge, and attention has been drawn to the importance of the unification of gauges before further expenditure on railway construction is incurred by the States. The problem is, however, one which is by no means easy of solution, and the difficulties are increased by the introduction of what may be called questions of local or State policy. That its solution would facilitate the development of commerce and the settlement on the land throughout the Commonwealth, is now widely recognised. The economic disadvantages of breaks of gauge, and of any artificial restrictions in regard to trade finding its proper geographical outlets, are also seen by dispassionate observers. It is obvious, too, that in the event of a foreign invasion of any part of the seaboard, the interchange and concentrations of rolling stock for the transport of men and war material would be impeded, and might result in confusion and loss. It is asserted, moreover, that unification of gauges would

tend to reduce to a negligible quantity all tendency to disorganisation and undue congestion likely to occur at times of bountiful seasons; that various trades and industries would be benefited by the concentration, at times of abnormal or periodic activity, of idle trucks from other States; in other words, that the fullest use of all rolling stock and the meeting of all exigencies would be facilitated.

As regards the unification of gauges, the question naturally arises as to which gauge, if any, should be adopted as the universal gauge of the Commonwealth. As regards Government railways only, the New South Wales gauge has a mileage of 3,472½; Victoria and South Australia have a combined mileage of 3,913¾ of 5 ft. 3 in. gauge; while Queensland, South Australia, the Northern Territory, and Western Australia have together 6,727½ miles of 3 ft. 6 in. gauge. The mere question of preponderance of mileage, therefore, indicates the 3 ft. 6 in. gauge for adoption. But this question is obviously subordinate to those involving engineering and economic considerations. Thus the relative efficiency from the widest point of view, the relative costs of alterations of permanent way and rolling stock, of carrying capacity and speed, that is to say, questions of a technical nature about which figures are not available, enter into the grounds for decision. As regards the unification of the New South Wales and Victorian lines, the advantage of reducing the broad gauge to the 4 ft. 8½ in. gauge is that there would be no necessity for the alteration of tunnels, cuttings, bridges, or viaducts.

5. **Average Mileage Worked, Train Miles Run, Number of Passenger Journeys, and Tonnage of Goods and Live Stock Carried on Government Railways, 1901 to 1908.**—The preceding table gives the actual mileage open for traffic at the end of each financial year, but, in considering the returns relating to revenue and expenditure and other matters, it is desirable to know the average number of miles actually worked during each year. The next table shews the average number of miles worked, the total number of train miles run, the number of passenger journeys, and the tonnage of goods and live stock carried by the Government railways of each State during each financial year from 1900-1 to 1907-8, inclusive:—

GOVERNMENT RAILWAYS.—AVERAGE MILEAGE WORKED, TRAIN MILES RUN, NUMBER OF PASSENGER JOURNEYS, AND TONNAGE OF GOODS AND LIVE STOCK CARRIED, 1901 TO 1908.

State.	1900-1.	1901-2.	1902-3.	1903-4.	1904-5.	1905-6.	1906-7.	1907-8.
				AVERAGE MILEAGE WORKED.				
N.S.W.	2,818	2,953	3,074	3,224	3,281	3,367	3,428	3,469
Vic. ...	3,228	3,265	3,335	3,371	3,384	3,394	3,395	3,396
Q'land	2,801	2,801	2,777	2,827	3,066	3,109	3,137	3,239
S.A. ...	1,736½	1,736½	1,736½	1,736½	1,744½	1,745½	1,814½	1,860½
N.T. ...	145½	145½	145½	145½	145½	145½	145½	145½
W.A.	1,355	1,356	1,434	1,535	1,568	1,607	1,676	1,830
Tas. ...	*460	*468	*469	469	470	470	470	470
Cwlth.	12,544	12,725	12,971	13,308	13,059	13,838	14,066	14,410
				TRAIN MILES RUN.				
N.S.W.	10,763,097	11,649,059	11,548,338	10,400,503	10,467,886	11,863,682	12,949,068	14,251,052
Vic. ...	11,066,016	11,284,944	10,286,272	9,172,644	9,023,365	9,392,069	10,035,914	10,383,408
Q'land	5,815,282	5,666,058	4,947,242	4,646,987	4,917,781	5,281,611	6,126,136	6,557,723
S.A. ...	4,393,181	4,196,138	3,770,351	3,739,088	3,773,106	3,875,167	4,334,243	5,010,121
N.T. ...	30,277	30,275	30,422	31,545	30,703	30,461	30,901	31,007
W.A.	4,126 202	4,507,919	4,611,315	4,594,234	4,285,235	4,359,633	4,180,796	3,964,230
Tas. ...	*895,682	*902,918	*931,716	947,588	945,852	945,918	981,379	1,028,030
Cwlth.	37,090,337	38,237,311	36,125,656	33,532,589	33,443,928	35,748,541	38,038,437	41,225,571

GOVERNMENT RAILWAYS.—AVERAGE MILEAGE WORKED, ETC.—Continued.

State.	1900-1.	1901-2.	1902-3.	1903-4.	1904-5.	1905-6.	1906-7.	1907-8.
NUMBER OF PASSENGER JOURNEYS.								
N.S.W.	29,261,324	30,885,214	32,384,138	33,792,689	35,158,150	37,500,531	41,413,084	47,487,030
Vic. ...	54,704,062	57,465,077	54,798,073	54,282,003	59,702,050	65,088,394	70,170,089	74,907,425
Q'land	†8,647,194	†8,421,258	‡7,353,177	†7,527,831	7,655,613	8,214,617	9,301,542	10,419,794
S.A. ...	8,863,632	9,643,058	9,061,488	9,747,412	9,866,621	10,715,343	11,497,802	12,839,428
N.T. ...	4,097	3,755	3,631	3,653	4,200	2,852	3,205	2,882
W.A.	6,823,453	8,158,299	9,106,396	10,225,976	11,845,439	12,816,766	13;180,161	12,945,561
Tas. ...	*777,445	*761,345	*814,483	†872,937	823,911	860,519	951,823	1,019,668
Cwlth.	109,081,207	115,338,006	113,521,386	116,452,501	125,055,984	135,199,022	146,517,706	159,621,788
TONNAGE OF GOODS AND LIVE STOCK CARRIED.								
N.S W.	6,398,227	6,467,552	6,596,241	6,656,759	6,724,215	7,629,492	8,793,832	10,175,389
Vic. ...	3,381,860	3,433,627	3,093,997	3,439,203	3,628,237	3,676,017	3,965,792	3.754.861
Q'land§	1,530,440	1,725,520	1,566,960	1,572,226	1,712,243	1,791,675	2,261,299	2,423.529
S.A. ...	1,628,444	1,392,257	1,349,617	1,515,621	1,681,003	1,732,436	2,042,939	2,255,996
N.T. ...	2,081	2,436	2,455	6,209	3,790	4,903	3,243	3.513
W.A.	1,719,720	1,888,146	1,795,019	2,057,270	2,154,275	2,096,514	2,091,376	2.058,741
Tas.§ ...	*314,628	*407,505	*418,701	†425,102	393,838	399,487	428,387	465,186
Cwlth.‖	14,976,300	15,317,043	14,822,990	15,672,390	16,297,601	17,330,524	19,586,868	21,137,215

* For the calendar years 1901, 1902, and 1903 respectively. The average mileage worked is larger than the actual mileage open, owing to the fact that the Government Railways have running powers over certain private lines. † The returns are for a period of six months ended the 30th June, 1904; the figures here given are estimated for a full period of twelve months. ‡ These figures are partly estimated, the actual returns excluding journeys by season ticket holders. § Exclusive of live stock. ‖ Exclusive of live stock returns for Queensland and Tasmania.

6. **History of Railway Construction.**—The first movement in the direction of the introduction of railways into Australia took place in 1846, when it was resolved, at a public meeting held in Sydney, that a survey should be made for a proposed line to connect the metropolis with Goulburn, a distance of 136 miles; the cost of construction was estimated at £6000 per mile, and a net profit of 8 per cent. per annum was anticipated. This survey was completed in 1848, and in the same year the Sydney Railroad and Tramway Company was formed, with a capital of £100,000, for the purpose of laying down a line between Liverpool, Parramatta, and Sydney, which it was proposed to extend later to Bathurst and Goulburn.

(i.) *New South Wales.* When the work of construction of the Sydney to Liverpool line was first commenced there was an abundant supply of labour, and rapid progress was at first made; the scheme was only well under weigh, however, when the discovery of gold caused a general exodus from the city, and the company found it impossible to secure sufficient labour to enable them to carry on their undertaking. In 1853 a movement for the construction of a line from Maitland to Newcastle took place and the Hunter River Railway Company was formed, and the work of construction was proceeded with at once. It was not long before this company shared the fate of its predecessor, and the properties and works of both companies were transferred to the Government under Act 18 Vic., No. 40, which placed the construction of the lines under the control of three Commissioners. It is interesting to note that the Government consented, in the year 1852, to allow 500 railway labourers to be brought out at the expense of the immigration fund. With the assumption of control by the Government the work of construction was vigorously pushed forward, and on the 26th September, 1855, the line form Sydney to Parramatta, 14 miles in length, was opened for traffic. For some years

after this, however, railway construction languished, the enthusiasm of its advocates being, doubtless, considerably damped by the reflection that the short line from Sydney to Parramatta cost about £700,000—or £50,000 a mile. On the 27th May, 1869, the extension to Goulburn was completed. This line now forms part of the main interstate line between Sydney and Melbourne. In the meantime—in 1857—Newcastle had been connected with East Maitland by a line 17 miles in length ; the line forms the first section of what is now known as the Northern Line. From Parramatta a line was extended in a westerly direction to Blacktown in 1860, and this line has now been further extended to form the main Western Line. For the purpose of convenience of reference and administration the Government railways in New South Wales are divided into three main lines with their branches, viz.:—the Northern Line, the Western Line, and the Southern Line. (*a.*) *The Northern Line* forms part of the main interstate route between New South Wales and Queensland. A junction was effected at Wallangarra, on the border between the two States, on the 16th January, 1888, and on the 1st May, 1889, the bridge over the Hawkesbury River was opened for traffic. After passing through Newcastle, 104 miles from Sydney, the line throws off a long branch from Werris Creek, extending in a north-westerly direction to Narrabri, Cryon, Collarendabri, and Inverell, which is 500 miles distant from Sydney. There is another line in the extreme north-east district of the State, known as the Grafton-Tweed line, at present isolated from the other railway lines. It has been suggested that this line should be joined to the main Northern line, and also to the South-coast line from Brisbane, and thus to form an alternative route between the two States. The total length of the line is 147 miles, and the last section to Grafton was completed in 1905 ; from Murwillumbah, the northern terminus, a steamer now runs to Tweed Heads which is connected with Brisbane by the Queensland South-coast line. (*b.*) *The Western Line*, running inland in a westerly direction, was completed as far as Bourke, its present terminus, 508 miles from Sydney, in 1885. It has three important branches, the first running from Orange to Condobolin, on the River Lachlan; the second from Dubbo to Coonamble; and the third from Nyngan to Cobar, from which place it is proposed to eventually extend the line to Broken Hill, *via* Wilcannia. (*c*) *The Southern Line* forms part of the main route between Sydney and Melbourne, a junction having been effected between the New South Wales and Victorian lines in 1883, as stated above. Numerous branches have been constructed from the main southern line ; Goulburn is the junction for two branches ; one to Cooma, passing through the pastoral district of Monaro for a distance of 130 miles, was opened in 1889 ; the other to Crookwell, 36 miles in length, was completed in 1902. From Cootamundra there are also two branch lines, the last extensions of which were opened for traffic in 1903 ; one runs to Wyalong, a distance of 80 miles, and the other to Tumut, 65 miles in length. From Junee a branch runs parallel to the Murrumbidgee River and was opened as far as Hay in 1882, and to Finley in 1898, thus bringing the Riverina district into direct communication with Sydney. From Culcairn one branch to Corowa was opened in 1892 and another to Germanton in 1902. The southern system also includes the Illawarra line, which runs from Sydney along the south coast as far as Nowra, a distance of 92 miles.

(ii.) *Victoria.* While the Sydney Railroad and Tramway Company was struggling with financial difficulties, and endeavouring to secure a sufficient supply of labour to enable them to carry on their undertaking, the work of railway construction was commenced in the neighbouring State of Victoria. In 1853, three private companies, viz.:—the Melbourne and Hobson's Bay Railway Company; the Melbourne, Mount Alexander, and Murray River Railway Company; and the Geelong and Melbourne Railway Company —having a total capital of £1,450,000, were incorporated for the purposes of railway construction. On the 13th September, 1854, the first complete railway in Australia, from Flinders Street, Melbourne, to Port Melbourne, was opened for traffic. This line was constructed by the Melbourne and Hobson's Bay Railway Company ; it had been commenced nearly three years later than the line to connect Parramatta with Sydney,

but was only 2½ miles long. On the 13th May, 1857, the same company opened for traffic the line from Flinders Street to St. Kilda. On the 17th June, 1857, a line from Williamstown to Geelong, thirty-nine miles in length, built by the third of the companies referred to, was declared open, and during the period from 1859 to 1861 lines to Richmond, Windsor, Hawthorn, and Brighton were opened by the Melbourne and Suburban Railway Company, which had been incorporated in 1857 with a capital of £300,000. In the meantime the Government, in addition to providing substantial aid to these companies in the shape of land grants and guarantees of interest, had taken over two unfinished lines and proceeded to complete the work of construction on its own account. These lines, running from Williamstown to Footscray, and from Melbourne to Sunbury, were opened for traffic in 1859. On the 21st October, 1860, the line to Essendon, constructed by the Melbourne and Essendon Railway Company, was opened. In 1865 the Hobson's Bay Company and the Suburban Company were amalgamated under the name of the Melbourne and Hobson's Bay United Railway Company. By the end of the year 1868 the Government had acquired all the railway lines in the State, with the exception of those owned by the amalgamated companies, which lines amounted to a total length of 16⅓ miles, and which were eventually purchased by the Government in 1878. At the present time the Government railways are divided into seven systems—the South-eastern, the Eastern, the North-eastern, the Northern (including the Midland district lines), the North-western, the Western and South-western, and the Suburban systems. (*a*) *The South-eastern system* branches off from the suburban system at Dandenong, and was completed as far as Port Albert, its present terminus, in 1892; a branch line to Outtrim was opened in 1896. (*b*) *The Eastern system* also leaves the suburban system at Dandenong. The line was opened for traffic as far as Bunyip in 1877, and was extended *via* Moe and Sale, as far as Bairnsdale on the Gippsland lakes, 171 miles from Melbourne, in 1888; branches run to Neerim South, Thorpdale, North Mirboo, and Briagolong. The Eastern system also comprises two extensions to the suburban system, the first running from Croydon to Healesville, with a branch from Lilydale to Warburton, the second running to Upper Fern Tree Gully, with a narrow gauge (2 ft. 6 in.) extension to Gembrook, completed in 1900. (*c*) *The North-eastern system* comprises the Victorian part of the main interstate line between Melbourne and Sydney, which was opened for traffic as far as Wodonga in 1873, though it was not until ten years later that the bridge over the River Murray was completed, and railway communication between New South Wales and Victoria established. Numerous branches from the main line have been constructed, the principal being the Goulburn Valley line, which was opened to Numurkah in 1881, and to Cobram in 1888, with spur lines to Rushworth, Echuca (connecting with the Northern line), Katamatite, Picola, and Tocumwal—the extension to the last-named place being constructed in 1905. A branch to Bright was opened as far as Myrtleford in 1883, and was extended in 1890; a branch to Yea in 1883, with the final extension to Mansfield in 1891; to Tallangatta and to Yackandandah in 1891; and a narrow gauge (2 ft. 6 in.) branch to Whitfield in 1899. (*d*) *The Northern system* joins the suburban system at Digger's Rest, twenty-one miles from Melbourne. The main line was opened for traffic as far as Bendigo in 1862, and was extended to Echuca in 1864. A large number of branch lines belong to this system. From Carlsruhe a branch runs to Ballarat, *via* Daylesford and Creswick, while another line branches off from Creswick to Maryborough. Between Carlsruhe and Daylesford the line attains a height of 2469 feet above sea-level, being the greatest altitude of any line in Victoria. From Maryborough the line was extended to the north as far as St. Arnaud in 1878, to Donald in 1882, to Birchip in 1893, and to Mildura in 1903; other branches were finally extended to Swan Hill, Sea Lake and Ultima, and were opened in 1890, 1895, and 1900 respectively. Mildura is the most northerly point reached by rail in Victoria, and is situated close to the confluence of the Darling and Murray Rivers. (*e*) *The North-western line* connects with the suburban system at Rockbank, eighteen and a half miles from Melbourne; it was opened as far as Ballarat, *via* Geelong, in 1862, and was extended in sections *via* Ararat, Stawell, Murtoa, Horsham, and Dimboola as far as Serviceton, on

the South Australian border, on the 19th January, 1887, a junction with the main line to Adelaide being thus effected. The direct line from Melbourne to Ballarat, however, was not completed until February, 1887. Several comparatively short lines branch off from Ballarat, while other branches were opened to Hopetoun and to Goroke in 1894; to Rainbow in 1899; and from Stawell to Grampians in 1905. (*f*) *The Western and South-western system* was opened up to Geelong in 1857, as stated above. The line was extended to Winchelsea in 1876, to Colac in 1877, to Warrnambool and to Port Fairy in 1890, and was connected with the main line to Serviceton, *via* Hamilton and Ararat, in 1890. An extension to Portland was completed in 1877, and branch lines were opened to Casterton and Coleraine in 1884 and 1888 respectively. (*g*) *The Suburban system* includes a number of short lines referred to above connecting up the suburbs of Melbourne, and also comprises longer sections of lines radiating from the metropolis in various directions, and thus joining the various main systems with the terminal stations in Melbourne.

Since the year 1899 four narrow gauge (2 ft. 6 in.) lines, with a total mileage of 81½ miles, have been opened for traffic in Victoria; these lines have been built for the purpose of providing a light and cheap means of communication to districts but sparsely populated, and have, in some cases, been constructed on the principle (provided for by the Railway Lands Acquisition Acts 1893 to 1899) of "loading" the lands increased in value by the building of the lines.

(iii.) *Queensland.* Legislative sanction for the construction by the Government of the first railway line in Queensland, from Ipswich to Grandchester, was granted in the year 1863, and on the 25th February in the following year the formality of cutting the first sod was carried out with due ceremony at Ipswich. The line was opened on the 31st July, 1865, and was extended to Toowoomba, seventy-seven miles from Ipswich, in 1867. In the same year a line, thirty miles in length, was opened between Rockhampton and Westwood, extended to Emerald in 1879 and to Longreach in 1892. Branches were opened from Emerald to Clermont and from Emerald to Springsure in 1884 and 1887 respectively. In the meantime the line had been extended from Toowoomba—(*a*) to the south as far as Wallangarra, on the New South Wales border, in 1887; and (*b*) to the west, *via* Dalby, Roma, and Mitchell, as far as Charleville, in 1888. An extension from Charleville to Cunnamulla, 503 miles from Toowoomba, was opened in 1898. Communcation between Brisbane and Rockhampton was opened up in 1903, and in the same year the South-coast line from Brisbane was extended to Tweed Heads. The first section of the Townsville line, as far as Reid River, a distance of thirty-five miles, was opened in 1880, and was extended to Charters Towers in 1882; to Hughenden in 1887; and to Richmond in 1904; while a further extension to Cloncurry, 173 miles from Richmond, was completed in 1908. The first section of the Mackay line was opened in 1885, and extended to Eton in 1886. The Normanton line, as far as Haydon, a distance of thirty-eight miles, was brought into use in 1889, and extended to Croydon in 1891. In 1885 a line from Cooktown to Palmer's Road, thirty miles in length, was opened for traffic, and an extension to Laura was completed in 1888. The line running from Cairns was commenced in 1887, and was completed as far as Atherton in 1903. Two further extensions to this line are now under construction, one from Atherton, through Herberton, to the Evelyn tableland, a distance of thirty-one miles, and the other from Tolga to the Johnston River, a distance of nineteen miles. The Bowen line was opened to Guthalungra in 1890, and extended to Bobawaba in 1891.

(iv.) *South Australia.* The first railway line constructed in the State of South Australia was the Adelaide City and Port Railway, opened on the 21st April, 1856, the length being seven and a half miles and the gauge 5 ft. 3 in. This line was extended to the Semaphore, a further distance of one and a half miles, in 1878, and is now called the Port line. In 1857 a line from Adelaide, nineteen miles long, reaching as far as Smithfield, was opened for traffic, and was extended to Terowie, via Gawler, Roseworthy, and Hamley Bridge in 1880. Terowie is the terminus of the broad gauge line, but from the

main line a narrow gauge (3 ft. 6 in.) line was run to Petersburg in 1881, connection being thus formed with the narrow gauge lines, which had been previously constructed, running from Port Wakefield, Moonta, Port Pirie, and Port Augusta, from which place it is now proposed to construct a transcontinental line by connecting it with Kalgoorlie, on the Western Australian goldfields. From Petersburg a branch to Cockburn on the New South Wales border was opened in 1887, and an extension through New South Wales territory to Broken Hill, a distance of thirty-six miles, was opened by the Silverton Tramway Company in 1888. Another branch from Quorn was opened to Oodnadatta, 688 miles from Adelaide, in 1891. (*a*) *The Interstate Line.*—The first section of the South Australian part of the interstate line was opened from Adelaide to Aldgate, a distance of twenty-one and three-quarter miles, in 1883, and extended until the Victorian boundary was reached on the 1st January, 1885. In the districts lying to the south of Adelaide, a horse-tramway line, constructed in 1854 between Goolwa and Port Elliott, was extended to Victor Harbour in 1864, and to Strathalbyn in 1869; railway communication was opened up between these districts and Adelaide in 1884. (*b*) *The Northern Territory Railway.*—In the Northern Territory a survey was made in 1878 for a line between Palmerston and Pine Creek, a distance of 145½ miles, and this line was opened for traffic in 1889; it is proposed to carry it across the continent in a southerly direction to meet the trunk line from Adelaide to the north, which at present has its terminus at Oodnadatta. (*c*) *Recent Extensions.* On the 14th September, 1906, a line from Tailem Bend to Pinnaroo, 86½ miles in length, was completed. Large areas in the vicinity of this line have since been thrown open for settlement. On the 18th November, 1907, the first section of the Western system from Port Lincoln to Cummins—42 miles long—was opened. In 1908 extensions of existing lines were completed from Largs Junction to Outer Harbour, and from Mitcham to Clapham.

(v.) *Western Australia.* Railway operations commenced in Western Australia with the construction of a private line from Lockeville to Yoganup, a distance of 12 miles, opened by the Western Australian Timber Company in 1871. A line from Geraldton to the copper mining district of Northampton, a length of thirty-four miles, was opened for traffic on the 26th July, 1879. In the following year no further lines were opened, but on the 1st March, 1881, the Fremantle-Guilford line, nineteen and a half miles long, was brought into use, to which line extensions were made to Chidlow's Well, opened on the 11th March, 1884, and to York and Beverley in 1885 and 1886 respectively, while branch lines to Northam and to Newcastle followed in October, 1886, and January, 1888. (*a*) *The South-Western Railway.*—On the 12th March, 1891, a third separate system was added by the opening of a line running sixteen miles inland from Bunbury, and this line was connected with the other systems in the State in 1893, by the opening of a line 110 miles in length from East Perth Junction to Picton Junction, near Bunbury. Further extensions and branches were opened in the next two years, and on the 30th June, 1895, 573 miles had been opened for traffic. (*b*) *The Eastern Goldfields Line.*—The Goldfields railway system was commenced by the construction of the line from Northam to Southern Cross, a distance of 170 miles, opened in 1894. On the 1st January, 1897, communication was established with Kalgoorlie, and the line was extended to Menzies on the 13th February, 1899, and to Laverton, 595½ miles from Perth, on the 1st February, 1905. (*c*). *The Northern Line.*—In the meantime the Geraldton line had been connected with Perth by the Midland Railway, constructed by a private company under a land grant concession, and on the 21st November, 1894, line from Mullewa Junction, near Geraldton, was opened, passing through pastoral country for a distance of about fifty-seven miles in the direction of the Murchison fields. In the Murchison district an extension as far as Nannine was opened for traffic on the 1st June, 1903. On the 1st July, 1889, the West Australian Land Company opened for traffic a line which had been constructed, 243 miles in length, from Albany to Beverley, the southern terminus of the eastern system, under a land grant concession of 12,000 acres per mile of line constructed. The lands and railways belonging to this company

were acquired by the Government by purchase on the 1st December, 1896, at a price of £1,100,000. This line is now known as the Great Southern line, and from it several spur lines serving agricultural areas have been recently constructed. *(d) The Water Supply Question.*—Reference may here be made to the fact that the main natural difficulty with which railway engineers have had to contend in Western Australia has been found to be the scarcity of water in practically the whole of the country traversed by their system. Excepting only the South-Western lines, the water supply for the locomotives is generally obtained from dams or reservoirs which are dependent upon the rainfall. The Railway Department on the Eastern and Eastern Goldfield Railway expended over £180,000 in dams prior to the Goldfields water scheme water being available, and a large condensing plant capable of condensing 100,000 gallons of water daily, was erected at Coolgardie in 1899. A sextuple multiple effect condensing plant for sea water was laid down at Geraldton in 1904, and a water-softening plant, capable of softening 2000 gallons of water per hour, was erected at Laverton in 1906. The Goldfields water scheme, however, now renders the whole of the lines from Midland Junction to Kanowna independent of local conservation.

(vi.) *Tasmania.* In Tasmania an agitation had long existed for the construction of a line of railway from Hobart to Launceston, and, although Parliament granted a vote of £5000 for the survey of this line as far back as the year 1863, it was not formally opened for traffic until November, 1876, from which time the line was continuously worked by the Tasmanian Main Line Railway Company up to October, 1890, when it was purchased by the Government for the sum of £1,106,500. In the meantime the construction of a line between Launceston and Deloraine, forty-five miles in length, had been commenced, and was opened on the 10th February, 1871. This line was originally projected by a private company—the Launceston and Western Railway Company—but a large part of the capital was raised by the Government, and, the company becoming involved in financial difficulties, the line was taken over by the State in 1872. In 1884 a length of forty-eight miles of line was opened for traffic by the Emu Bay Railway Company, extending from Emu Bay to Mount Bischoff and to Waratah. Branches from the main line between Hobart and Launceston were opened from Parattah to Oatlands, a distance of four and a half miles, in 1885, and from Bridgewater to Glenora, twenty-four and a half miles in length, in 1888. The line from Launceston to Scottsdale, a distance of forty-seven miles, was brought into use on the 9th August, 1889. The lines from Deloraine to Devonport and from Conara to St. Mary's were opened in 1885 and 1886 respectively. Several years elapsed before any further extensions were taken in hand. In 1892 the Government submitted several railway proposals to Parliament, and, having obtained the necessary authority, railway construction was once more resumed. The railway systems of Tasmania are now fairly well developed, and, though their construction has been slow, it must be remembered that they have had to face severe competition with sea-borne traffic, and that, owing to the limited area and population of the State, there are no large inland centres to support the traffic on the railways.

7. Length and Gauge of Railway System in each State.—A map shewing the State railway lines, and also the private lines open to the public for general traffic, in the different States of the Commonwealth is given at the end of this sub-section. In all the States the Government railways are grouped, for the purpose of convenience of administration and management, into several divisions or systems, some of which have already been briefly referred to above in dealing with the history of construction of the railways. The subjoined summary shews concisely the gauge and length of the main and branch lines included in each division or system of the different States of the Commonwealth for the year ended the 30th June, 1908:—

GOVERNMENT RAILWAYS, 1908.

Particulars.	Length.	Gauge.
	Miles.	ft. in.
1. NEW SOUTH WALES.		
(i.) The Northern line and branches—		
(*a*) Main line. Strathfield-Wallangarra	489	4 8½
(*b*) Branch lines	408	4 8½
(ii.) The Grafton-Tweed line	149	4 8½
(iii.) The Western line and branches—		
(*a*) Main line. Granville-Bourke	495	4 8½
(*b*) Branch lines	672	4 8½
(iv.) The Southern line—		
(*a*) Main line. Granville-Wodonga	381	4 8½
(*b*) Branch lines	701½	4 8½
(v.) The South-coast (Illawarra) line—		
(*a*) Main line. Sydney to Nowra...	93	4 8½
(*b*) Branch lines	7	4 8½
(vi.) Suburban lines	37	4 8½
(vii.) Broken Hill line. Broken Hill-Tarrawingee	40	4 8½
Total	3,472½	...
2. VICTORIA.		
(i.) The South-eastern system—		
(*a*) Main lines. Dandenong-Port Albert, Aspendale-Stony Point	145	5 3
(*b*) Branch lines	14	5 3
(ii.) The Eastern system—		
(*a*) Main lines. Dandenong-Bairnsdale, Bayswater-Gembrook, Croydon-Healesville....	18	2 6
	202	5 3
(*b*) Branch lines	97	5 3
	3	2 6
(iii.) The North-eastern system—		
(*a*) Main line. Craigieburn-Wodonga	171	5 3
(*b*) Branch lines	30½	2 6
	440½	5 3
(iv.) The Northern system—		
(*a*) Main line. Digger's Rest-Echuca	135	5 3
(*b*) Branch lines	925	5 3
(v.) The North-western system—		
(*a*) Main line. Rockbank-Serviceton	266	5 3
(*b*) Branch lines	195	5 3
(vi.) The Western and South-western system—		
(*a*) Main line. Werribee-Portland	272	5 3
(*b*) Branch lines	30	2 6
	264	5 3
(vii.) The Suburban system— Including the lines to Aspendale, Dandenong, Bayswater, Croydon, Eltham, Craigieburn, Digger's Rest, Rockbank, and Werribee	188	5 3
Total	3,396	...

Particulars.	Length.	Gauge.
3. QUEENSLAND.	Miles.	ft. in.
(i.) The Southern division—		
(*a*) The Southern line. Brisbane-Wallangarra ...	233	3 6
(*b*) The Western line. Gowrie Junction-Cunnamulla ...	495	3 6
(*c*) The Nth.-coast line. Northgate Junction-235 mls. 14 chs.	229	3 6
(*d*) The South-coast line. Yeerongpilly-Tweed Heads ...	69	3 6
(*e*) Suburban lines	76	3 6
(*f*) Branch lines	607	3 6
(ii.) The Central division—		
(*a*) The Coast line. 235 miles 14 chains-Rockhampton ...	161	3 6
(*b*) The Central line. Archer Park-Longreach ...	429	3 6
(*c*) Branch lines	233	3 6
(iii.) The Northern division—		
(*a*) Mackay line	42	3 6
(*b*) Bowen line	48	3 6
(*c*) The Great Nthn. Rlwy. Townsville-Winton branches	556	3 6
(*d*) Cairns line	69	3 6
(*e*) Cooktown line	68	3 6
(*f*) Normanton line	96	3 6
Total	*3,411	...
4. SOUTH AUSTRALIA.		
(i.) The Midland system—		
(*a*) Main line. Adelaide-Terowie	140	5 3
(*b*) Branch lines	101	5 3
(ii.) The Northern system—		
(*a*) Terowie-Oodnadatta	548	3 6
(*b*) Other lines	455	3 6
	5	5 3
(iii.) The Southern system—		
(*a*) Main line. Adelaide to Serviceton	194½	5 3
(*b*) Branch lines	158¾	5 3
(iv.) The South-eastern system—		
(*a*) Wolseley-Mount Gambier	112	3 6
(*b*) Branch lines	113	3 6
(v.) Port Broughton line	10	3 6
(vi.) The Western system—		
Port Lincoln-Cummins	42	3 6
Total	1,879¼	...
5. NORTHERN TERRITORY.		
Palmerston-Pine Creek	145½	3 6
6. WESTERN AUSTRALIA.		
(i.) Eastern railway—		
(*a*) Main line. Fremantle-Beverley	111	3 6
(*b*) Branch lines	94½	3 6
(ii.) Eastern Goldfields railway—		
(*a*) Main line. Northam-Laverton	520	3 6
(*b*) Branch lines	136½	3 6
(iii.) South-western railway—		
(*a*) Main line. Perth-Bunbury	115	3 6
(*b*) Branch lines	281½	3 6
(iv.) Great Southern railway—		
(*a*) Beverley-Albany Jetty	243	3 6
(*b*) Branch lines	86½	3 6
(v.) Northern railway—		
(*a*) Main line. Geraldton-Nannine	310	3 6
(*b*) Branch lines	45	3 6
Total	1,943	...

* This includes 52 miles from Inglewood to Goondiwindi opened on the 13th October, 1908.

Particulars.	Length.	Gauge.
7. TASMANIA.	Miles.	ft. in.
(i.) Main line. Hobart-Evandale Junction	122¾	3 6
(ii.) Derwent Valley line. Bridgewater-Glenora	24¼	3 6
(iii.) Apsley line. Brighton Junction-Apsley	26	3 6
(iv.) Parattah-Oatlands line	4⅓	3 6
(v.) Fingal line. St. Mary's-Conara	46⅝	3 6
(vi.) Western line. Launceston-Burnie	111½	3 6
(vii.) Chudleigh line	12½	3 6
(viii.) Scottsdale line. Launceston-Scottsdale	47½	3 6
(ix.) Sorell-Bellerive line	14½	3 6
(x.) Zeehan line. Regatta Point-Zeehan	29½	3 6
(xi.) North-east Dundas tramway. Zeehan-Williamsford ...	19	2 0
(xii.) Comstock tramway	4¼	2 0
Total	463	...
Grand total of Government railways in the Commonwealth ...	*14,710¾	...

* Including 52 miles from Inglewood to Goondiwindi, Queensland, opened 13th October, 1908.

8. **Administration and Control of Government Railways.**—In each State of the Commonwealth the policy has now been established that the railway should be kept under the control of the Government. This policy, as has been shewn, was early actualised in Australia, and, excepting in cases presenting unusual circumstances, may be regarded as the settled policy of the country. It may here be observed that for many years past nationalisation of railways throughout Europe has been a feature of the development of railway policy, and so far there is no sign of any movement in an opposite direction. Indeed it may be said that the Governments have recognised the supreme importance of a railroad policy, not only as an element in the industrial, but even in the political life of nations, and have felt that nothing short of complete ownership and direct management of the railroads would give them the power which, for national reasons, they must exert. And in America the modern tendency is to so condition the freights by Governmental action as to give at least a quasi-national character to the railways.

(i.) *New South Wales.* Prior to the year 1888 the control of the State railways in New South Wales was vested in the Minister for Works, under the provisions of the Railways Act of 1858, the actual management being in the hands of a Commissioner. In 1888, however, the Act referred to was repealed by a new Act, the object of which was to improve the administration and to free it from political influences. Under this Act, as amended in 1901, three Commissioners were appointed for a period of seven years, but in 1906 an amending Act was passed, which provides for the appointment of a Chief Commissioner with supreme power, an Assistant Commissioner for Railways, and an Assistant Commissioner for Tramways. The Chief Commissioner is required to present an annual report to Parliament, through the Minister for Railways, setting forth an account of his proceedings, and of the revenue and expenditure during the previous year. New lines are constructed by the Railway and Tramway Construction Branch of the Public Works Department, and on completion are handed over to the control of the Chief Commissioner.

(ii.) *Victoria.* In consequence of general dissatisfaction in regard to the management of the railways by political heads, a new Railway Act was passed and came into force on the 1st November, 1883. Under its provisions the management and control of the State railways were placed in the hands of three Commissioners, who supervised the construction of new lines as well as the general management of lines already

open for traffic. On the 1st January, 1892, the duty of the construction of new lines was transferred to the Board of Land and Works, and the Minister, under the provisions of the Railways Act of 1891, was given greater powers to interfere in matters of policy. In 1895 the Government appointed a Board to inquire into and report upon the general working of the Railway Department, and as a result of their report the Railways Act of 1896 was passed. The management was again placed in the hands of one Commissioner until the year 1903, when the Victorian Railway Commissioners Act was passed, and the administration was again placed in the hands of three Commissioners.

Proposals for the construction of new lines are in every case, in which the estimated cost is in excess of £20,000, investigated by the Parliamentary Standing Committee on Railways, whose recommendation is submitted to the Legislature. Any new line authorised by Parliament is constructed under the supervision of the Chief Engineer for Railway Construction, who is responsible to the Minister of Railways for the time being, and is not subject to the control of the Commissioners. New lines are constructed under the authority of the Railway Lands Acquisition Acts 1893 to 1899.

(iii.) *Queensland.* The first Act referring to the construction of railways, passed by the Queensland Legislature in 1863, provided for the appointment of a Commissioner of Railways, who was to be the permanent head of the Railway Department, but was, however, also to be subordinate, as regards all matters of administration, to the Minister in charge of the railways for the time being. This arrangement was continued until the year 1888, when an Act was passed providing for the appointment of three Commissioners invested with full powers as to the administration, management, and construction of the railways, the control of which was thus removed from political influence. The functions of a Minister for Railways were not abolished, but they were so defined and limited that the Minister became in effect an intermediary between the Commissioners and Parliament, to which body the Commissioners were bound to make an annual report, setting forth an account of their proceedings and a financial statement for the previous year. The Railways Act Amendment Act of 1896 again provided for the appointment of one Commissioner only, for a term not exceeding three years, extended in 1902 to a maximum term of seven years. Under the Act of 1896 the Commissioner is required to prepare an annual report of the Railway Department. New lines are constructed by the Commissioner under the Railways Act of 1906. Under this Act the ratepayers in any district in which a new line is constructed are liable for the amount of any deficiency in case the earnings in any year are less than the working expenses, together with interest at the rate of 3 per cent. on the cost of construction. The separation from each other by long distances of some of the railway lines in Queensland puts difficulties in the way of their economical administration and supervision, since it is found necessary to maintain, in connection with each of the principal detached lines, a separate staff of engineering and managing officials.

(iv.) *South Australia.* The Railway Clauses Consolidation Act, passed in South Australia in March, 1847, was the first Act passed in Australia referring to the construction of railways; its provisions, however, contained many obsolete clauses of English railway legislation, and were soon modified. In 1887 an Act to make better provision for the construction, maintenance, and management of railways was passed, and came into force on the 1st June, 1888; it removed the control of the railways from political influence and provided for the appointment of three Commissioners, into whose hands the management and the supervision of the railways passed. The Act of 1887 was, however, amended by the Railway Commissioners Act of 1894, which provides for one Commissioner only, assisted by a Board of Advice. Under the Act of 1894 the Commissioner has the same powers as were vested in the three Commissioners under the Act of 1887. Further amendments were made in the years 1902 and 1906, but since the Act of 1894 was passed the management, maintenance, and construction of the railways have remained in the hands of one Commissioner, who is required to present to Parliament an annual report of his proceedings, and of the revenue and expenditure during the previous year.

(v.) *Western Australia.* From the time of the inception of railways in this State until the granting of responsible government in 1890, the construction, maintenance, and control of all railways were in the hands of an official holding the title of Commissioner of Railways, and having a seat in the Executive Council. This official was invested with very extensive powers for all purposes connected with railways, and had also to supervise the safe working and the charges made by private railway owners. On the institution of responsible government the office of Commissioner was converted into a Ministerial one; the active management was placed in the hands of an officer styled General Manager of Railways, while construction works on new lines were carried out by the Department of Public Works. In 1902 a Bill was introduced into Parliament providing for the appointment for a term of five years of a Railway Commissioner to be free from political influence. This Bill received the Vice-regal assent on the 20th December, 1902. The former Railway Acts, of which the Act in question was an amendment, continued to remain in force, with the result that certain anomalies and ambiguities arose, in consequence of which a Consolidatiug Government Railways Act was passed in 1904. Under its provisions the administration of all Government railways was placed in the hands of the Commissioner, who was relieved from the supervision of private railways. The construction of new railways or of extensions is left, as formerly, in the hands of the Minister controlling the Department of Public Works. The Act of 1904 was amended in certain details in 1907.

(vi.) *Tasmania.* The law relating to the control and management of the Tasmanian Government railways was amended and consolidated by the Railway Management Act of 1891, which has in turn been amended by Acts passed in 1893, 1896, and 1901. The control and construction of Government railways is vested in a responsible Minister, the active management and maintenance being in the hands of an officer styled the General Manager, who is subject to such directions as he may receive from the Minister.

9. **Lines under Construction, and Authorised and Proposed Lines.**—The following statement gives particulars up to the 30th June, 1908, of the mileage of Government railways (*a*) under construction, and (*b*) authorised for construction but not commenced :-

MILEAGE UNDER CONSTRUCTION AND AUTHORISED, 30th JUNE, 1908.

Particulars.	N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	Cwlth.
Mileage under construction ...	185¾	28½	360	10	101	...	685½
Mileage authorised	391¼	66¾	96	48¾	304	...	906¾

(i.) *Lines under Construction.* In spite of the great extension of State railways which has taken place since the year 1875 throughout the Commonwealth, there are still, in some of the States, tracts of country of immense area, which are as yet practically undeveloped, and in which little in the nature of permanent settlement has been accomplished; the general policy in the States is to extend the existing lines inland, in the form of light railways, as settlement increases, and although it is true that lines which were not likely to be commercially successful in the immediate future have been constructed from time to time, for the purpose of encouraging settlement, the general principle that the railways should be self-supporting is kept in view. (*a*) In *New South Wales* the lines under construction are chiefly of the "pioneer" class, and are made with a view to affording railway communication over level country to districts in which the traffic would not warrant the expenditure necessary to provide thoroughly equipped lines. As the traffic increases the permanent way is strengthened in order to allow the heavy types of engines to run over it. It is probable that railway extension in New South Wales, in the near future, will be mainly confined to lines of the "pioneer" class. One of the most important lines now under construction is that from Maitland to Dungog, a distance of 32¾ miles. The extension of this line as far as Grafton, a further distance of 278 miles,

has been authorised, and, when completed, will form part of an alternative main route between Newcastle and Brisbane. Other lines under construction are as follows:—Manilla to Barraba, 32 miles; Mudgee to Gulgong, 20¼ miles; Ariah Park to Barellan, 41 miles; Belmore to Chapel-road, 3½ miles; Cryon to Walgett, 34 miles; and Trundle to Tullamore, 22¼ miles. (*b*) *Victoria.* In this State the following lines were under construction by the Board of Land and Works on the 30th June, 1908:—Moe to Walhalla, a distance of 26¼ miles; and an extension, 2¼ miles long, across the Murray River to the township of Tocumwal in New South Wales. It is proposed to construct a line from Ouyen to Kow Plains, a distance of 55¾ miles, for the purpose of opening up about 650,000 acres to settlement in the western Mallee. (*c*) *Queensland.* At the end of the year 1907-8 two important railways were nearing completion, viz., Inglewood to Goondiwindi, 53 miles; and Julia Creek to Cloncurry, 83 miles. In addition the following lines had been commenced on the day labour system—from Kannangur to Blackbutt, 28 miles; from Goondiwindi to Talwood, 56 miles; from Caboolture to Woodford, 18 miles; the Boyne Valley line, 52 miles; New Zealand Gully to Yeppoon, 20 miles; Atherton to Evelyn, 31 miles; and Tolga to Johnstone River, 19 miles. (*d*) *South Australia.* In this State the only line under construction on the 30th June, 1908, was the Port Lincoln extension north of Cummins, 10 miles in length, the gauge being 3 feet 6 inches. (*e*) In *Western Australia* the following lines were in course of construction by the Public Works Department on the 30th June, 1908:—Hopetoun to Ravensthorpe, 34½ miles; Donnybrook to Preston, second section, 23 miles; Jarrahwood to Nannup, 17 miles: and Narrogin to Wickepin, 26½ miles.

(ii.) *Lines Authorised for Construction.* (*a*) In *New South Wales*, in addition to the North-coast railway extension from Dungog to Grafton, a distance of 278 miles, the following lines had been authorised for construction up to the 30th June, 1908:—Narromine to Peak Hill, 36 miles; Lockhart to Clear Hills, 50½ miles; and Gulgong to Dunedoo, 26¾ miles. (*b*) In *Victoria* the following lines were authorised during 1907:—Nyora to Wollamai, 17¼ miles; Rupanyup to Marnoo, 15¾ miles; and Alexandra Road to Alexandra, 4½ miles. (*c*) *Queensland.* In addition to the new lines upon which work has been commenced, the following extensions have been approved by Parliament:—Blackall to 115 Miles, 44 miles; and Dalby towards Tara, 52 miles. (*d*) In *South Australia* the construction of lines from Laura to Booleroo Centre, on the 3 feet 6 inch gauge, and from Gawler to Angaston, on the 5 foot 3 inch gauge, were authorised during 1907. (*e*) In *Western Australia* five lines having a total length of 304 miles were authorised for construction up to the 30th June, 1908. These lines were—from Widgemooltha to Norseman, 57 miles; from Newcastle to Bolgart, 24 miles; from Mount Magnet to Black Range, 93 miles; from Pinjarra to Marrinup, 15 miles; and from Port Hedland to Marble Bar, 115 miles.

(iii.) *Proposed Transcontinental Lines.* (*a*) A proposal which has recently received considerable attention is to connect the railways of the eastern and southern districts of Australia with the Western Australian lines by the construction of a line between Port Augusta, in South Australia, and Kalgoorlie, on the Western Australian goldfields, a distance of 1100 miles. The Transcontinental Railway Bill, passed in 1907 by the Federal Houses of Parliament, provided for the expenditure of a sum of £20,000 for a preliminary survey of the proposed line, the estimated cost of construction of which amounts to £4,559,000. This survey was commenced in 1908, and was nearing completion in February, 1909. The greater part of the country which it is proposed to traverse is practically unoccupied owing to the scarcity of permanent surface water, but there are otherwise no engineering difficulties in connection with the construction of this line, which it is claimed would be of immense benefit in the expedition of the European mails to the southern and eastern parts of the continent, and, if occasion should arise, in facilitating the transport of troops. (*b*) Another proposal is to extend the main northern line from Adelaide, which at present terminates at Oodnadatta, as far as Pine Creek, the southern terminus of the Northern Territory line from Palmer-

ston. The distance between Oodnadatta and Pine Creek by the route followed by the telegraph wire is 1140 miles, and it is claimed that, if a railway line were constructed between these two places, it would be practicable for passengers and mails to reach London from Adelaide in seventeen days, *via* Port Darwin and the trans-Siberian railway. In the course of the year 1896 offers were made on behalf of various syndicates to construct this line, but the Government was not at that time prepared to recommend the acceptance of any offer based upon the land grant or guarantee system. In 1902, however, the Trans-continental Railway Act was passed, and the Government invited tenders for the construction of 1063 miles of 3 ft. 6 in. line on the land grant system, to be built at the rate of at least 100 miles in any one year, the grant of land offered amounting to nearly 80,000,000 acres. No tenders were accepted and subsequent offers have been refused. The country through which this line would pass presents no great engineering difficulties; for the most part it is one vast plain, with an occasional sand ridge or a watercourse.

10. **Cost of Construction and Equipment of Government Railways.**—The total cost of construction and equipment of the State railways of the Commonwealth at the 30th June, 1908, amounted to £139,988,015, or to an average of £9550 per mile open for traffic. Particulars as to the capital expenditure incurred in each State are given in the following table :—

GOVERNMENT RAILWAYS.—COST OF CONSTRUCTION AND EQUIPMENT TO THE 30th JUNE, 1908.

State.	Length of Line Open.	Total Cost of Construction and Equipment.	Average Cost per Mile Open.	Cost per Head of Population.
	Miles.	£	£	£
New South Wales	3,472½	45,683,484	13,156	28.94
Victoria	3,396	41,928,567	12,346	33.39
Queensland	3,359	22,575,603	6,721	40.90
South Australia	1,879¼	13,909,635	7,402	35.24
Northern Territory	145½	1,180,174	8,115	327.82
Western Australia	1,943	10,732,941	5,524	40.41
Tasmania	463	3,977,611	8,591	22.04
Commonwealth	14,658¼	139,988,015	9,550	33.09

It will be seen that the lowest average cost per mile open is in Western Australia, and is only £5524, which is less than one-half of the highest average cost, namely, £13,156 in New South Wales, compared with an average of £9550 for the whole Commonwealth. In Western Australia there have been comparatively few engineering difficulties to contend with, and also the system has been adopted in that State of giving contractors the right to carry traffic during the period of their contracts, with the result that, at all events in all goldfields railway contracts, the cost of construction has been considerably lessened.

(1.) *Reduction of Cost per Mile in Recent Years.* The average cost per mile of the lines constructed lately in the Commonwealth is very much less than the figure given in the above table, in consequence of the construction of light "pioneer" lines, which have already been referred to, and which it was originally considered in New South Wales could be laid down at a cost of £1750 per mile (exclusive of stations and bridges). It should also be remembered that in the early days of railway construction there were considerable engineering difficulties to overcome, and that labour was scarce and dear. Since 1891 over one thousand miles of the "pioneer" lines have been opened in New South Wales, the average cost ranging from about £2000 to £7500 per mile, according to

the difficulties met in the country traversed. The lowest cost per mile for any line previously constructed had been that of the line from Nyngan to Cobar, the average cost of which was £3736. In Victoria also the cost of construction has been greatly reduced in recent years. The total cost to the 30th June, 1908, of the narrow gauge (2 ft. 6 in.) lines, having a length of eighty-one and a half miles, was only £169,987, which gives an average cost per mile of only £2085. In the other States also the cost of construction per mile has been reduced by building light railways as cheaply as possible. Fairly substantial permanent way is laid down with reduced ballast, and, as settlement progresses and traffic increases, the road is strengthened and the stations and siding accommodation enlarged. The subjoined table gives examples of some of the more expensive lines, most of which were built in the early days, while the next succeeding table gives instances of lines which have been constructed in more recent years at a comparatively small cost per mile.

GOVERNMENT RAILWAYS.—EXAMPLES OF LINES CONSTRUCTED AT LARGE CAPITAL EXPENDITURE PER MILE OPEN.

Line.	Gauge.	Length.	Total Cost.	Average Cost per Mile.	Date of Opening.
	ft. in.	Miles.	£	£	
NEW SOUTH WALES—					
Penrith to Bathurst	4 8½	112⅛	2,737,329	24,410	1876
Sydney to Kiama	4 8½	72½	2,016,003	27,766	1887
Homebush to Waratah ...	4 8½	95½	2,835,967	29,700	1887
VICTORIA—					
Melbourne to Bendigo ...	5 3	101	4,832,243	47,896	1862
Geelong to Ballarat	5 3	45½	1,898,687	35,683	1862

GOVERNMENT RAILWAYS.—EXAMPLES OF LINES CONSTRUCTED AT SMALL CAPITAL EXPENDITURE PER MILE OPEN.

Line.	Gauge.	Length.	Total Cost.	Average Cost per Mile.	Date of Opening.
	ft. in.	Miles.	£	£	
NEW SOUTH WALES—					
Parkes to Condobolin	4 8½	62¾	129,796	2,066	1898
Dubbo to Coonamble	4 8½	95⅞	230,254	2,402	1903
VICTORIA—					
Wangaratta to Whitfield ...	2 6	30½	38,857	1,274	1899
Strathmerton to Tocumwal ...	5 3	9⅝	17,791	1,806	1905
Birchip to Woomelang ...	5 3	26½	38,700	1,463	1899
SOUTH AUSTRALIA—					
Port Lincoln to Cummins ...	3 6	42	91,587	2,187	1907
Mount Gambier to Narracoorte...	3 6	63½	211,610	3,330	1887
QUEENSLAND—					
Dalby to Bell	3 6	23½	28,677	1,220	1906
Hughenden to Richmond ...	3 6	70½	110,779	1,574	1904
WESTERN AUSTRALIA—					
Southern Cross to Kalgoorlie ...	3 6	138½	235,718	1,702	1897
Mullewa to Cue	3 6	197	266,022	1,350	1898

The comparisons afforded in this table are subject to certain limitations inasmuch as the figures in each cost represent the total cost to date, and the cost is naturally greater in the case of the older lines. Further, the figures given represent the cost of construction only (i.e., are exclusive of cost of equipment), and cannot therefore be directly compared with the average cost given on page 705.

(ii.) *Proposed Adoption of Special Locomotives for Cheap Pioneer Lines.* The adaptation of the steam locomotive to the working of steep gradients and sharp curves has progressed during late years, so that very steep gradients, which were at one time considered to be only workable by a rack or grip rail with special complicated engines running at very slow speeds, are now being worked by adhesion locomotives. In view of the great importance of supplying a cheap and effective pioneer railway service to many parts where the steep and broken nature of the country would involve great expenditure on lines built to suit the standard classes of locomotives, the Standing Committee on Railways in Victoria has considered the advisability of adopting a special form of geared locomotive which would not be suitable for high speeds, but which could be worked on steep gradients and on curves of small radius. It is suggested that by the adoption of locomotives of this type considerable saving in cost could be made, due to (*a*) shortening of distance by use of steeper grades in places where easier grades would necessitate long detours. (*b*) Reduction of sub-grade works, *i.e.*, earthworks, culverts, trestles, etc., by use of steeper grades and sharper curves to keep the formation nearer to the natural surface. (*c*) Cheaper track by using lighter rails and less ballast than necessary for standard adhesion locomotives.

(iii.) *Capital Cost of Construction and Equipment, Total and per Mile Open, 1901-8.* The increase in the total capital cost of construction and equipment of Government railways in each State and in the Commonwealth on the 30th June in each year, from 1901 to 1908, inclusive, is shewn in the following table :—

GOVERNMENT RAILWAYS.—CAPITAL COST OF CONSTRUCTION AND EQUIPMENT, 1901 to 1908.

State.	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908.
TOTAL COST.								
	£	£	£	£	£	£	£	£
N.S.W.	38,932,781	40,565,073	41,654,977	42,288,517	43,062,550	43,626,063	44,700,230	45,683,484
Vict. ...	40,145,404	40,613,784	40,974,493	41,216,703	41,279,045	41,398,037	41,533,136	41,928,567
Qld. ...	19,739,495	20,119,143	20,302,177	20,887,585	21,610,980	21,741,226	21,839,081	22,575,603
S.A. ...	13,156,291	13,275,037	13,400,796	13,517,727	13,587,406	13,610,520	13,699,029	13,909,635
N. Ter.	1,170,484	1,160,757	1,175,056	1,180,584	1,179,059	1,180,424	1,180,395	1,180,174
W.A. ...	7,098,239	7,410,426	8,141,782	8,955,929	9,808,458	9,965,940	10,300,938	10,732,941
Tas. ...	3,799,098[1]	3,840,747[1]	3,883,729[1]	3,901,414	3,920,508	3,926,713	3,943,359	3,977,611
Cwlth.	124,041,792	126,984,967	129,533,010	131,948,459	134,448,006	135,448,923	137,196,168	139,988,015
COST PER MILE OPEN.								
	£	£	£	£	£	£	£	£
N.S.W.	13,690	13,405	13,270	12,889	13,125	12,869	12,945	13,156
Vict. ...	12,402	12,300	12,112	12,191	12,162	12,197	12,235	12,346
Qld. ...	7,047	7,183	7,489	7,134	6,989	6,931	6,962	6,721
S.A. ...	7,577	7,646	7,718	7,785	7,783	7,797	7,491	7,402
N. Ter.	8,049	7,982	8,080	8,118	8,104	8,117	8,117	9,115
W.A. ...	5,239	5,449	5,371	5,812	6,111	6,182	5,840	5,524
Tas. ...	8,304[1]	8,317[1]	8,411[1]	8,449	8,476	8,490	8,526	8,590
Cwlth.	9,861	9,895	9,893	9,792	9,795	9,754	9,669	9,550

1. To the 31st December, 1901, 1902, and 1903 respectively.

(iv.) *Loan Expenditure on Railways and Tramways, 1901 to 1908.* The subjoined table shews the total loan expenditure on Government railways and tramways (including lines both open and unopen) in each State during each financial year from 1901 to 1908. Figures shewing loan expenditures on railways only are not available :—

GOVERNMENT RAILWAYS AND TRAMWAYS.—LOAN EXPENDITURE, 1901 to 1908.

State.	1901-2.	1902-3.	1903-4.	1904-5.	1905-6.	1906-7.	1907-8.
	£	£	£	£	£	£	£
N.S.W.	2,243,672	1,683,755	805,520	501,709	529,251	421,741	1,363,314
Vic. ...	483,325	371,330	258,090	171,837	77,968	73,843	249,646
Qld. ...	751,451	695,632	388,255	119,651	157,537	554,783	885,070
S.A. ...	121,907	143,970	120,152	101,195	70,451	47,121	55,510
W.A.	578,985	1,059,418	443,339	348,327	219,937	329,527	305,817
Tas. ...	*80,948	*56,731	*37,450	†19,655	6,168	15,153	38,927
Cwlth.	4,260,288	4,010,836	2,052,806	1,262,374	1,061,312	1,442,168	2,898,284

* For the calendar years 1901, 1902, and 1903 respectively. † For the eighteen months ended 30th June, 1905.

The following statement shews the total loan expenditure to the 30th June, 1908 :—

GOVERNMENT RAILWAYS AND TRAMWAYS.—TOTAL LOAN EXPENDITURE IN EACH STATE AND IN THE COMMONWEALTH TO THE 30th JUNE, 1908.

State, etc. ...	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	C'wealth.
	£	£	£	£	£	£	£
Expenditure ...	51,356,903	30,144,835	25,183,529	13,996,437	10,254,315	4,182,838	144,118,857

11. **Revenue and Working Expenses.**—The following table shews the amounts of gross revenue, working expenses, and excess of revenue over expenditure per mile of line worked and per train mile run in each State for the year ended 30th June, 1908 :—

GOVERNMENT RAILWAYS.—GROSS REVENUE, WORKING EXPENSES, AND NET REVENUE FOR YEAR ENDED 30th JUNE, 1908.

State.	Average Mileage work'd.	Number of Train Miles Run.	Revenue.			Working Expenses.			Excess of Revenue over W'rkg. Expenses.		
			Gross.	Per Mile w'rkd.	Per Train Mile.	Gross.	Per Mile w'rkd.	Per Train Mile.	Net.	Per Mile w'rkd.	Per Train Mile.
	Miles.	No.	£	£	d.	£	£	d.	£	£	d.
N.S.W. ...	3,469	14,251,052	4,944,134	1,425	83.26	2,714,839	783	45.72	2,229,295	643	37.54
Victoria* ...	3,396	10,383,408	3,873,368	1,141	89.53	2,436,019	717	56.31	1,437,349	423	33.22
Queensland	3,359	6,557,723	1,950,881	602	71.40	1,053,736	325	38.56	897,145	277	32.83
South Aust.	1,860¼	5,010,121	1,741,259	936	83.41	969,530	521	46.44	771,729	415	26.97
N. Territory	145½	31,007	14,462	99	111.94	14,060	97	108.83	402	2	3.11
West. Aust.	1,830	3,964,230	1,501,925	821	90.93	1,007,732	551	61.01	494,193	270	29.82
Tasmania ...	470	1,028,030	277,606	591	64.81	201,817	429	47.12	75,789	161	17.70
C'wealth ...	14,530	41,225,571	14,303,635	993	83.27	8,397,733	583	48.89	5,905,902	410	34.38

* Working expenses include £47,058 for special expenditures and charges, and £103,064 for pensions and gratuities. (See paragraph 16 below).

(i.) *Traffic Receipts and Revenue from other Sources.* The gross revenue is composed of (*a*) receipts from coaching traffic, including the carriage of mails, horses, parcels, etc., by passenger trains; (*b*) receipts from the carriage of goods and live stock, and (*c*) rents and miscellaneous items. The following table shews the amount derived from each of these sources for the year ended the 30th June, 1908, and the respective percentages of the whole revenue :—

GOVERNMENT RAILWAYS.—AMOUNT AND PERCENTAGE OF GROSS REVENUE FROM DIFFERENT SOURCES IN EACH STATE AND IN THE COMMONWEALTH FOR THE YEAR ENDED 30th JUNE, 1908.

State.	Total Revenue.	Coaching Traffic Revenue.	Coaching Traffic Percentage of Total.	Goods and Live Stock.	Goods, etc., Percentage of Total.	Rents and Miscellaneous Items.	Rents, etc., Percentage of Total.
	£	£	%	£	%	£	%
N.S.W. ...	4,944,134	1,850,061	37.42	3,043,444	61.55	50,629	1.03
Victoria ...	3,873,368	1,935,261	49.96	1,868,441	48.24	69,666	1.80
Queensland ...	1,950,881	671,939	34.44	1,250,489	64.10	28,453	1.46
South Australia	1,741,259	511,423	29.37	1,184,867	68.04	44,969	2.59
N. Territory ...	14,462	3,663	25.33	8,463	58.52	2,336	16.15
West. Australia	1,501,925	483,099	32.16	973,741	64.84	45,085	3.00
Tasmania ...	277,606	137,124	49.39	131,933	47.53	8,549	3.08
C'wealth ...	14,303,635	5,592,570	39.10	8,461,378	59.15	249,687	1.75

12. **Gross Revenue, Total, per Average Mile Worked, and per Train-mile Run, 1901 to 1908.**—The following table shews the total revenue from all sources, the revenue per average mile worked, and the revenue per train-mile run in each State during each financial year from 1901 to 1908, inclusive :—

GOVERNMENT RAILWAYS.—GROSS REVENUE, TOTAL, PER AVERAGE MILE WORKED, AND PER TRAIN MILE, 1901 TO 1908.

State.	1900-1.	1901-2.	1902-3.	1903-4.	1904-5.	1905-6.	1906-7.	1907-8.
TOTAL GROSS REVENUE.								
	£	£	£	£	£	£	£	£
New South Wales ...	3,573,779	3,668,686	3,314,893	3,436,413	3,684,016	4,234,791	4,709,406	4,944,134
Victoria	3,337,797	3,367,843	3,046,858	3,438,141	3,582,266	3,787,619	4,012,641	3,873,368
Queensland ...	1,316,936	1,382,179	1,234,230	1,305,552	1,413,439	1,546,083	1,829,673	1,950,881
South Australia ...	1,236,616	1,085,175	1,076,612	1,160,639	1,273,321	1,349,765	1,575,368	1,741,259
Northern Territory	13,845	12,522	11,298	17,906	15,429	14,897	14,018	14,462
Western Australia...	1,353,704	1,521,429	1,553,485	1,588,084	1,610,129	1,634,444	1,537,333	1,501,925
Tasmania	*205,791	*233,211	*247,683	†247,910	243,556	241,188	258,223	277,606
Commonwealth	11,038,468	11,271,045	10,485,059	11,193,745	11,822,156	12,808,787	13,936,662	14,303,635
GROSS REVENUE PER AVERAGE MILE WORKED.								
	£	£	£	£	£	£	£	£
New South Wales ...	1,268	1,242	1,078	1,066	1,123	1,258	1,374	1,425
Victoria	1,034	1,031	914	1,020	1,059	1,116	1,182	1,141
Queensland ...	470	493	444	462	461	497	583	602
South Australia ...	712	625	620	668	730	773	868	936
Northern Territory	95	86	78	117	106	102	96	99
Western Australia...	999	1,122	1,083	1,035	1,027	1,017	917	821
Tasmania	*447	*498	*528	†529	518	513	549	590
Commonwealth	880	886	808	841	866	926	991	993
GROSS REVENUE PER TRAIN-MILE RUN.								
	d.	d.	d.	d.	d.	d.	d.	d.
New South Wales ...	79.69	75.58	68.89	79.30	84.46	85.67	87.28	83.26
Victoria	72.39	71.62	71.09	89.96	95.28	96.79	95.96	89.53
Queensland ...	54.35	58.55	59.87	67.43	68.98	70.26	71.68	71.40
South Australia ...	67.56	62.07	68.53	74.50	80.99	83.59	87.23	83.41
Northern Territory	109.75	99.27	89.13	129.36	120.61	117.37	108.87	111.94
Western Australia...	78.74	81.00	80.85	82.96	90.18	89.98	88.25	90.93
Tasmania	*55.14	*61.99	*63.80	†62.79	61.80	61.19	63.15	64.81
Commonwealth	71.43	70.74	69.66	80.12	84.84	85.99	86.57	83.27

* For the financial years 1901, 1902, and 1903 respectively.
† For twelve months ended the 30th June, 1904.

The falling-off in the amount of the gross railway revenue in Victoria during the year 1907-8 was due to a partial failure of the grain and other crops, owing to the unfavourable season, and to reductions in rates made during the year (see paragraph 23 hereinafter). There was a decrease in Victoria in the previous year of £188,003 in the revenue derived in connection with grain and its products, and of £20,184 in dairy produce, whereas there was an increase of £49,558 in the revenue from live-stock traffic due to the unusual movement of stock which took place in consequence of the dry weather during 1908. In Western Australia, also, the falling-off is to a large extent accounted for by the reductions in rates.

13. **Coaching, Goods, and Miscellaneous Receipts, 1901 to 1908.**—The subjoined table shews the gross revenue, during the years 1901 to 1908, inclusive, classified according to the three chief sources of receipts. The total of the three items specified has already been given in the preceding paragraph hereof:—

COACHING, GOODS, AND MISCELLANEOUS RECEIPTS, 1901 to 1908.

State.	1900-1.	1901-2.	1902-3.	1903-4.	1904-5.	1905-6.	1906-7.	1907-8.
COACHING TRAFFIC RECEIPTS.								
	£	£	£	£	£	£	£	£
New South Wales...	1,336,489	1,367,796	1,370,544	1,405,350	1,428,190	1,563,261	1,736,206	1,850,061
Victoria	1,560,894	1,580,218	1,525,340	1,561,973	1,598,354	1,719,713	1,862,660	1,935,261
Queensland ...	445,699	435,434	430,308	455,957	477,859	529,139	613,601	671,939
South Australia ...	362,587	372,709	344,950	370,410	382 503	405,258	455,454	515,086
Western Australia	382,966	442,719	449,677	484,486	502,671	506,598	497,414	483,099
Tasmania*	99,393	110,196	116,470	†119,146	118,273	121,374	129,009	137,124
Commonwealth ...	4,138,028	4,309,072	4,237,289	4,397,322	4,507,850	4,845,343	5,294,344	5,592,570
GOODS AND LIVE STOCK TRAFFIC RECEIPTS.								
New South Wales...	2,203,249	2,263,837	1,907,950	1,989,946	2,213,105	2,628,076	2,922,843	3,043,444
Victoria ...	1,711,894	1,719,462	1,454,770	1,792,978	1,918,793	2,001,437	2,081,515	1,868,441
Queensland ...	772,219	862,234	766,636	810,177	899,984	982,820	1,180,862	1,250,489
South Australia ...	851,911	689,041	710,522	773,165	869,561	919,549	1,091,916	1,193,330
Western Australia	870,578	1,037,099	1,046,540	1,066,949	1,061,364	1,081,472	992,111	973,741
Tasmania* ...	98,713	116,061	121,129	†120,080	116,938	111,042	119,701	131,933
Commonwealth ...	6,508,564	6,687,734	6,007,547	6,553,295	7,079,745	7,724,396	8,388,948	8,461,378
MISCELLANEOUS RECEIPTS.								
New South Wales...	34,041	37,053	36,399	41,117	42,721	43,454	50,357	50,629
Victoria	65,009	6[illegible],163	66,743	83,190	65,119	66,469	68,466	69,666
Queensland ...	99,018	84,511	37,286	39,418	35,596	34,124	35,210	28,453
South Australia ...	35,963	35,947	32,438	34,070	36,686	39,855	42,016	47,305
Western Australia	100,160	41,611	57,268	36,649	46,094	46,374	47,808	45,085
Tasmania* ...	7,685	6,954	10,084	†8,684	8,345	8,772	9,513	8,549
Commonwealth ...	341,876	274,239	240,223	243,128	234,561	239,048	253,370	249,687

* *Tasmanian figures for 1901, 1902, and 1903 are for years ended the 31st December.* † For twelve months ended the 30th June, 1904.

The falling-off in the amounts of revenue during the last year in the States of Victoria and Western Australia is commented upon in the preceding paragraph hereof.

14. **Coaching Traffic Receipts per Average Mile Worked, per Passenger-train Mile, and per Passenger Journey.**—The subjoined table shews the receipts from coaching traffic per average mile of line worked, per passenger-train mile, and per passenger journey in each State and in the Commonwealth for the year ended the 30th June, 1908:—

GOVERNMENT RAILWAYS.—COACHING TRAFFIC RECEIPTS PER MILE OPEN, PER PASSENGER JOURNEY, AND PER PASSENGER-TRAIN MILE, 1908.

State.	Number of Passenger Journeys.	Number of Passenger-Train Miles.	Coaching Traffic Receipts.			
			Gross.	Per Average Mile Worked.	Per Passenger-Train Mile.	Per Passenger Journey.
	No.	No.	£	£	d.	d.
New South Wales ...	47,487,030	6,504,568	1,850,061	534	68.26	9.35
Victoria	74,907,425	*6,138,332	1,935,261	569	75.66	6.20
Queensland ...	10,419,794	2,125,160	671,939	200	75.88	15.48
South Australia ...	12,839,428	1,874,318	511,423	275	65.48	9.56
Northern Territory...	2,882	10,609	3,663	25	82.86	305.03
Western Australia ...	12,945,561	†1,988,026	483,099	264	58.32	8.95
Tasmania	1,019,668	‡356,845	137,124	292	92.22	32.27
Commonwealth ...	159,621,788	18,997,858	5,592,570	388	70.65	8.41

* The returns include 2,494,834 mixed-train mileage, which has been divided between passenger-train miles and goods-train miles in the proportion of one-third and two-thirds respectively. † The returns include 718,007 mixed-train mileage, which has been divided as just stated. ‡ The returns include 700,612 mixed-train mileage, which has been divided as just stated.

The receipts per passenger journey shew that there is a considerable difference in the amount of the average receipt per passenger journey. Disregarding the Northern Territory, this amount ranges from 6.20 pence in Victoria, where there is a large metropolitan suburban traffic, to 32.27 pence in Tasmania. The difference in these amounts cannot be accounted for by the amounts of rates charged, which are fairly uniform in the several States (see paragraph 23 hereof), but is largely due to the different traffic conditions which prevail on various lines in the Commonwealth (see paragraph 20 hereof). In order to adequately analyse these figures it would be necessary to have particulars regarding the number of passenger-miles, *i.e.*, the total distance travelled by passengers, in each State, which particulars are not generally available (see paragraph 21 hereof).

The preponderance in the number of passenger journeys in Victoria is accounted for, to a great extent, by the large number of metropolitan suburban passengers in that State. Of the total number of passengers carried in Victoria, 68,799,680 were metropolitan suburban passengers, i.e., were carried between stations within twenty miles of Melbourne, while in New South Wales the number of suburban passengers (between stations within twenty-two miles of Sydney and Newcastle) was 41,404,022. In Sydney a large proportion of the metropolitan suburban traffic is carried on the electric tramways, the number of passenger journeys during the year 1907-8 being 159,722,892. In Melbourne, on the other hand, the number of passengers carried on the cable tramways systems during the same period was 63,945,512; on the St. Kilda-Brighton electric tramways the number was 1,146,484; and on the North Melbourne tramways was 1,639,768, making a total of 66,731,764, which is not as great as the number carried on the metropolitan suburban railways. This matter is referred to hereinafter. (See para. 20.)

15. **Goods and Live-Stock Traffic Receipts per Mile Worked, per Goods-Train Mile, and per Ton Carried.**—The following table shews the gross receipts from goods and live-stock traffic per mile worked, per goods-train mile, and per ton carried for the year ended the 30th June, 1908:—

GOVERNMENT RAILWAYS.—GOODS AND LIVE-STOCK TRAFFIC RECEIPTS PER MILE WORKED, PER GOODS-TRAIN MILE, AND PER TON CARRIED, 1908.

State.	Number of Goods-Train Miles.	Goods and Live-Stock Tonnage.	Goods and Live-Stock Traffic Receipts.			
			Gross.	Average per Mile Worked.	Per Goods-Train Mile.	Per Ton Carried.
	No.	Tons.	£	£	d.	d.
New South Wales ...	7,746,484	10,175,389	3,043,443	877	94.29	71.78
Victoria	4,245,076†	3,754,861	1,868,441	550	105.63	119.42
Queensland ...	4,432,563	2,423,529*	1,250,489	372	67.70	123.83
South Australia ...	3,135,803	2,255,996	1,184,867	637	90.68	126.05
Northern Territory ...	20,398	3,513	8,463	58	99.57	578.17
Western Australia ...	1,976,204‡	2,058,741	973,741	532	118.25	113.51
Tasmania	671,185§	465,186*	131,933	281	47.18	68.07
Commonwealth ...	22,227,713	21,137,215	8,461,377	582	91.36	96.07

* Exclusive of live-stock tonnage. † The returns include 2,494,834 mixed-train mileage, which has been divided between passenger-train miles and goods-train miles in the proportion of one-third and two-thirds respectively. ‡ The returns include 718,007 mixed-train mileage, which has been divided as just stated. § The returns include 700,612 mixed-train mileage, which has been divided as just stated.

From the above table it may be seen that, disregarding the Northern Territory, the average amount of freight paid per ton ranges from 71.78 pence in New South Wales to 126.05 pence in South Australia. The remarks made in the preceding paragraph (14) hereof with regard to the average fare paid per passenger and to passenger-miles, apply equally to the average amount of freight paid per ton and to ton-miles.

16. **Working Expenses.**—In order to make an adequate comparison of the working expenses of the Government railways in the several States, allowance should be made for the variation of gauges and of physical and traffic conditions, not only on the railways of the different States, but also on different portions of the same system. Where traffic is light, the percentage of working expenses is naturally greater than where traffic is heavy; and this is especially true in Australia, where ton-mile rates are in many cases based on a tapering principle—*i.e.*, a lower rate per ton-mile is charged upon merchandise from remote interior districts—and where on many of the lines there is but little back-loading. Further, though efforts have been made from time to time to obtain a uniform system of accounts in the several States, the annual reports of the Commissioners do not yet comprise fully comparable data of railway expenditure.

The following table shews the total annual expenditure, comprising expenses on (*a*) maintenance of way, works, and buildings; (*b*) locomotive power—repairs and renewals; (*c*) carriages and waggons—repairs and renewals; (*d*) traffic expenses; (*e*) compensation; and (*f*) general and miscellaneous charges; and also the percentage of these expenditures upon the corresponding gross revenues in each State from 1901 to 1908:—

GOVERNMENT RAILWAYS.—TOTAL WORKING EXPENSES AND PERCENTAGES OF WORKING EXPENSES UPON GROSS REVENUES, 1901 to 1908.

State.	1900-1.	1901-2.	1902-3.	1903-4.	1904-5.	1905-6.	1906-7.	1907-8.
TOTAL WORKING EXPENSES.								
	£	£	£	£	£	£	£	£
N.S.W. ...	2,043,201	2,267,369	2,266,299	2,258,940	2,192,147	2,308,384	2,499,741	2,714,839
Victoria* ...	2,075,239	2,166,119	2,032,087	2,022,403	2,222,279	2,216,202	2,353,303	2,436,019
Queensland	1,057,981	992,751	863,382	811,951	814,744	863,356	912,638	1,053,736
S. Australia	729,039	689,517	624,511	675,395	736,791	764,385	868,005	969,530
N. Territory	25,280	34,649	12,812	13,219	13,069	13,854	13,280	14,060
W. Australia	1,044,920	1,256,370	1,247,873	1,179,624	1,256,003	1,201,753	1,135,907	1,007,732
Tasmania ...	†173,400	†173,292	†166,355	‡166,029	171,630	172,601	185,500	201,817
C'wealth ...	7,149,060	7,580,067	7,213,319	7,127,561	7,406,663	7,540,535	7,968,374	8,397,733
PERCENTAGE OF WORKING EXPENSES TO GROSS EARNINGS.								
	%	%	%	%	%	%	%	%
N.S.W. ...	57.17	61.80	68.37	65.74	59.50	54.51	53.08	54.91
Victoria* ...	62.17	64.32	66.69	58.82	62.04	58.51	58.65	62.89
Queensland	80.34	71.83	69.95	62.19	57.64	55.84	49.88	54.01
S. Australia	58.95	63.54	58.01	58.19	57.86	56.63	55.10	55.68
N. Territory	182.59	276.70	113.40	77.73	84.70	93.00	94.74	97.22
W. Australia	77.19	82.58	80.33	74.28	78.01	73.52	73.89	67.10
Tasmania ...	†84.26	†74.31	†67.16	‡64.68	70.47	71.56	71.84	72.70
C'wealth ...	64.76	67.25	68.80	63.62	62.65	58.87	57.18	58.71

* Including amounts paid for pensions and gratuities, and also special expenditures and charges for belated repairs and in reduction of deficiences as follows:—For the year 1900-1, £111,943; for 1901-2, £115,244; for 1902-3, £196,137; for 1903-4, £220,092; for 1904-5, £351,141; for 1905-6, £217,179; and for 1906-7, £276,630; and for 1907-8, £150,122. For further particulars see next table. † For the calendar years 1901, 1902, and 1903 respectively. ‡ Estimated for a period of twelve months ended the 30th June, 1904.

From the above table it may be seen that during the last financial year there has been for the whole Commonwealth a slight increase in the percentage of working expenses to gross earnings. This increase is due chiefly to the fact that in three of the States, consequent on the favourable results of previous years, reductions were made in passenger fares and freight rates, while at the same time the natural growth of the traffic in certain commodities was somewhat retarded in some districts owing to the unfavourable season.

(i.) *Victoria—Special Expenditures and Charges.* The amounts of working expenses for Victoria specified in the preceding table include sums in respect of special expenditure and charges paid in liquidation of certain "extraordinary liabilities." The annual report of the Victorian Railways Commissioners for the year 1907-8 shews the amount of the "extraordinary liabilities" taken over at the 1st July, 1903, to be £825,180, composed as follows:—

Belated Repairs.	Deficiency in Rolling Stock.	Deficiency in Value of Stores.	Loan Funds Advanced for Renewal of Way and Works and Replacement of Rolling Stock.	Railway Accident Fund.	Total.
£181,087	£403,950	£60,855	£149,869	£29,419	£825,180

During the years 1901 and 1902 also, special expenditures and charges in respect of "extraordinary liabilities" were paid out of the year's railway revenue.

These "extraordinary liabilities" have now been completely liquidated at a cost lower than the original estimated cost specified above. The following table shews the amounts actually paid in reduction of these liabilities out of railway revenue during each year from 1901 to 1908, inclusive, and also shews the amounts paid for pensions and gratuities:—

VICTORIA.—SPECIAL EXPENDITURES AND CHARGES, 1901 to 1908.

Particulars.	1900-1.	1901-2.	1902-3.	1903-4.	1904-5.	1905-6.	1906-7.	1907-8.
	£	£	£	£	£	£	£	£
Belated repairs	...	...	78,913	84,555	54,752	5,617	...	...
Repay't of funds advanced	21,500	21,500	23,717	28,646	58,769	24,104	20,710	17,633
Deficiency in rolling stock	...	...	...	6,355	83,448	87,821	145,039	...
Deficiency in value of stores	...	...	...	...	51,516	...	...	...
Railway accident fund	...	...	...	...	...	...	...	29,419
Pensions and gratuities	90,443	93,744	93,507	100,536	102,656	99,637	110,881	103,064
Total...	111,943	115,244	196,137	220,092	351,141	217,179	276,630	150,122

(ii.) *Working Expenses per Average Mile Worked and per Train Mile Run, 1901 to 1908.* The following table shews the working expenses per average mile worked and per train mile run in each State for the years 1901 to 1908, inclusive:—

GOVERNMENT RAILWAYS.—WORKING EXPENSES PER AVERAGE MILE WORKED, AND PER TRAIN MILE RUN, 1901 to 1908.

State.	1900-1.	1901-2.	1902-3.	1903-4.	1904-5.	1905-6.	1906-7.	1907-8.
WORKING EXPENSES PER AVERAGE MILE WORKED.								
	£	£	£	£	£	£	£	£
N.S.W. ...	725	768	737	701	668	686	729	783
Victoria‡ ...	643	663	609	560	657	653	693	717
Queensland ...	378	354	311	287	266	278	291	325
S. Australia...	420	397	360	389	422	438	478	521
N. Territory	174	238	88	91	90	95	91	97
W. Australia	771	927	870	768	801	748	678	551
Tasmania ...	*377	*370	*355	†354	365	367	395	429
C'wealth ...	570	596	556	536	542	545	566	583
WORKING EXENSES PER TRAIN MILE RUN.								
	d.	d.	d.	d.	d.	d.	d.	d.
N.S.W. ...	45.56	46.71	47.10	52.13	50.26	46.70	46.33	45.72
Victoria‡ ...	45.01	46.07	47.41	52.92	59.11	56.63	56.28	56.31
Queensland ...	43.66	42.05	41.88	41.93	39.76	39.23	35.75	38.56
S. Australia...	39.83	39.44	39.75	43.35	46.87	47.34	48.06	46.44
N Territory	200.39	274.67	101.07	100.57	102.16	109.15	103.14	108.83
W. Australia	60.78	66.89	64.95	61.62	70.34	66.16	65.21	61.01
Tasmania ...	*46.46	*46.06	*42.85	†42.05	43.55	43.79	45.36	47.12
C'wealth ...	46.26	47.58	47.92	51.01	53.15	50.62	49.50	48.89

* For the years 1901, 1902, and 1903 respectively. † Estimated for a period of twelve months ended the 30th June, 1904. ‡ Including special expenditure and charges referred to above.

17. **Distribution of Working Expenses, 1901 to 1908.**—The subjoined table shews the distribution of working expenses, among four chief heads of expenditure, for each year from 1901 to 1908, inclusive:—

GOVERNMENT RAILWAYS.—DISTRIBUTION OF WORKING EXPENSES, 1901 to 1908.

State.	1900-1.	1901-2.	1902-3.	1903-4.	1904-5.	1905-6.	1906-7.	1907-8.
				MAINTENANCE.				
	£	£	£	£	£	£	£	£
N.S.W. ...	484,750	521,983	486,596	519,389	491,164	539,700	593,290	621,885
Victoria ...	518,488	501,938	437,840	448,959	502,022	572,297	589,452	648,589
Queensland	408,551	355,615	292,951	277,913	277,672	288,100	295,160	323,169
S. Australia	185,291	166,691	139,297	164,068	206,894	203,487	273,686	312,801
N. Territory	18,206	29,001	6,981	7,037	7,392	7,966	7,344	7,578
W.Australia	193,573	246,931	265,548	264,430	344,177	293,250	265,771	226,567
Tasmania ...	*59,897	*58,612	*51,957	†49,236	54,517	53,416	57,464	62,074
C'wealth	1,868,756	1,880,771	1,681,170	1,731,080	1,883,838	1,958,216	2,082,167	2,202,663
				LOCOMOTIVE, CARRIAGE, AND WAGGON CHARGES.				
N.S.W. ...	936,103	1,059,814	1,089,829	1,054,168	1,023,551	1,056,936	1,132,268	1,249,569
Victoria ...	793,345	855,464	762,715	719,530	763,171	788,325	844,941	956,467
Queensland	395,876	389,766	343,675	317,759	313,804	337,316	358,010	416,726
S. Australia	362,567	343,572	317,217	343,488	360,150	386,028	404,664	441,940
N. Territory	4,454	3,210	3,451	3,520	2,963	3,310	3,120	3,652
W.Australia	497,188	670,485	642,808	581,655	577,002	566,420	534,826	484,586
Tasmania ...	*63,579	*63,792	*62,376	†64,473	63,542	65,831	73,134	80,662
C'wealth	3,053,112	3,386,103	3,222,071	3,084,593	3,104,183	3,204,166	3,350,963	3,633,632
				TRAFFIC EXPENSES.				
N.S.W. ...	537,227	588,938	605,210	601,634	596,313	631,388	632,927	741,576
Victoria ...	609,000	640,442	592,897	586,015	562,370	588,123	593,248	612,719
Queensland	232,557	226,237	207,303	196,806	204,858	218,314	237,994	290,488
S. Australia	164,589	162,626	151,738	151,697	152,627	157,485	171,721	195,964
N. Territory	2,309	2,108	1,935	2,300	2,362	2,236	2,460	2,456
W.Australia	296,045	306,409	312,364	306,998	302,234	305,138	300,742	269,890
Tasmania ...	*41,138	*42,416	*42,820	†43,318	43,808	44,585	45,883	49,697
C'wealth	1,882,865	1,969,176	1,914,267	1,888,768	1,864,572	1,947,269	2,034,975	2,162,790
				OTHER CHARGES.				
N.S.W. ...	85,121	96,634	84,664	83,749	81,119	80,360	91,256	101,809
Victoria‡ ...	154,406	168,275	238,635	267,899	394,716	267,457	325,662	218,244
Queensland	20,997	21,133	19,453	19,473	18,410	19,626	21,474	23,353
S. Australia	16,592	16,628	16,259	16,144	17,120	17,385	17,934	18,825
N. Territory	311	330	445	362	352	342	356	344
W.Australia	58,114	32,545	27,153	26,541	32,590	36,945	34,568	26,689
Tasmania ...	*8,786	*8,472	*9,202	†8,952	9,763	8,769	9,019	9,384
C'wealth	344,327	344,017	395,811	423,120	554,070	430,884	500,269	398,648

* For the calendar years 1901, 1902, and 1903 respectively. † Estimated for a period of twelve months ended the 30th June, 1904. ‡ Including special expenditure and charges referred in paragraph 16 hereof.

18. **Analysis of Working Expenses, 1908.**—The following statement gives a comparative analysis of the working expenses of the Government railways in each State and in the Commonwealth; in this statement the total expenses are given, as well as the expenses per train mile and per mile worked.

GOVERNMENT RAILWAYS.—ANALYSIS OF WORKING EXPENSES, 1908.

Expenditure on :—		N.S.W.	Victoria.	Q'land.	S. A.	N. T.	W. Aust.	Tas.	C'wealth.
MAINTENANCE OF WAYS AND WORKS—									
Total	£	621,885	648.589	323,169	312,801	7,578	226,567	62,074	2,202,663
Per train mile ...	d.	10.47	14.99	11.83	14.98	58.65	13.71	14.52	12.82
Per mile worked...	£	179	191	96	168	53	124	132	151
LOCOMOTIVE POWER REPAIRS AND RENEWALS—									
Total	£	1,032,469	678,753	344,151	329,296	2,175	567,066	80,662	2,834,572
Per train mile ...	d.	17.39	15.69	12.59	15.77	16.83	22.22	18.81	16.50
Per mile worked...	£	299	209	103	176	15	200	171	195
CARRIAGE AND WAGON REPAIRS AND RENEWALS—								Included in Loco. Power, etc.	
Total	£	217,100	277,714	72,575	112,644	1,507	117,520		799,060
Per train mile ...	d.	3.65	6.42	2.66	5.39	11.66	7.12		4.65
Per mile worked...	£	62	82	21	60	10	64		55
TRAFFIC EXPENSES—									
Total	£	741,576	612,719	290,488	195,964	2,456	269,890	49,697	2,162,790
Per train mile ...	d.	12.49	14.16	10.63	9.49	19.02	16.34	11.60	12.59
Per mile worked...	£	213	180	86	105	17	148	106	149
OTHER CHARGES—									
Total	£	101,809	*218,244	23,353	18,825	344	26,689	9,384	398,648
Per train mile ...	d.	1.72	5.04	0.86	0.90	2.67	1.62	2.18	2.32
Per mile worked...	£	29	64	8	12	2	15	20	28
TOTAL EXPENSES ...	£	2,714,839	*2,436,019	1,053,736	969,530	14,060	1,007,732	201,817	8,397,733
Per train mile ...	d.	45.72	56.30	38.57	46.44	108.83	61.01	47.10	48.88
Per average mile worked	£	782	717	314	521	97	551	429	578

* Includes £47,058 for special expenditure and charges.

19. **Net Revenue, Total and per Cent. of Capital Cost, 1901 to 1908.**—The table given hereunder shews the net sums available to meet interest charges, and also the percentage of such sums upon the capital cost of construction and equipment, in each State for the years 1901 to 1908, inclusive:—

GOVERNMENT RAILWAYS.—NET REVENUE AND PERCENTAGE OF NET REVENUE UPON CAPITAL COST, 1901 to 1908.

State.	1900-1.	1901-2.	1902-3.	1903-4.	1904-5.	1905-6.	1906-7.	1907-8.
NET REVENUE.								
	£	£	£	£	£	£	£	£
N.S.W. ...	1,530,578	1,401,317	1,048,594	1,177,473	1,491,869	1,926,407	2,209,665	2,229,295
Victoria* ...	1,262,558	1,201,724	1,014,771	1,415,738	1,359,987	1,571,417	1,659,338	1,437,349
Queensland ...	258,955	389,428	370,848	493,601	598,695	682,727	917,035	897,145
S. Australia ...	507,577	395,658	452,101	485,244	536,530	585,380	707,369	771,729
N. Territory ...	— 11,435	— 22,127	— 1,514	3,787	2,360	1,043	738	402
W. Australia...	308,784	285,059	305,612	408,460	354,126	432,691	401,426	494,193
Tasmania ...	†32,391	†59,919	†81,328	‡81,881	71,926	68,587	72,723	75,789
C'wealth ...	3,889,408	3,690,978	3,271,740	4,066,184	4,415,493	5,268,252	5,968,288	5,905,902
PERCENTAGE OF NET REVENUE TO CAPITAL EXPENDITURE.								
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	percent
N.S.W. ...	3.93	3.45	2.52	2.78	3.46	4.42	4.94	4.88
Victoria* ...	3.14	2.96	2.48	3.43	3.29	3.80	4.00	3.43
Queensland ...	1.31	1.94	1.83	2.36	2.77	3.14	4.20	3.97
S. Australia ...	3.86	2.98	3.37	3.59	3.95	4.30	5.16	5.57
N. Territory ...	—0.98	—1.91	—0.13	0.32	0.20	0.09	0.06	0.03
W. Australia...	4.35	3.58	3.75	4.56	3.61	4.34	3.90	4.60
Tasmania ...	†0.85	†1.56	†2.09	‡2.10	1.83	1.75	1.84	1.91
C'wealth ...	3.14	2.91	2.53	3.09	3.28	3.89	4.35	4.22

* In addition to ordinary working expenses, special expenditures and charges paid out of each year's gross revenue have been deducted; see paragraph 16 above. † For the calendar years 1901, 1902, and 1903 respectively. ‡ Partly estimated.

(i.) *Net Revenue per Average Mile Worked and per Train Mile Run, 1901 to 1908.*—Tables shewing the gross earnings and the working expenses per average mile worked and per train mile run have been given above. The net earnings, *i.e.*, the excess of gross earnings over working expenses, per average mile worked and per train mile run are shewn in the following tables :—

GOVERNMENT RAILWAYS.—NET REVENUE PER AVERAGE MILE WORKED AND PER TRAIN MILE RUN, 1901 to 1908.

State.	1900-1.	1901-2.	1902-3.	1903-4.	1904-5.	1905-6.	1906-7.	1907-8.
NET REVENUE PER AVERAGE MILE WORKED.								
	£	£	£	£	£	£	£	£
N.S.W. ...	543	475	341	365	455	572	645	643
Victoria* ...	391	368	304	420	402	463	489	423
Queensland	92	139	134	175	195	220	292	277
S. Australia	292	228	260	279	308	335	390	415
N. Territory	— 79	—152	— 10	26	16	7	5	2
W. Australia	228	195	213	266	226	269	239	270
Tasmania ...	†70	†128	†173	‡174	153	146	155	161
C'wealth ...	310	290	252	306	323	381	424	410
NET REVENUE PER TRAIN MILE RUN.								
	d.	d.	d.	d.	d.	d.	d.	d.
N.S.W. ...	34.13	28.87	21.79	27.17	34.20	38.97	40.95	37.54
Victoria* ...	27.38	25.56	23.68	37.04	36.17	40.16	39.68	33.22
Queensland	10.69	16.50	17.99	25.49	29.22	31.02	35.93	32.83
S. Australia	27.73	22.53	28.78	31.15	34.11	36.25	39.17	36.97
N. Territory	—90.64	—175.40	—11.94	28.81	18.45	8.22	5.73	3.11
W. Australia	17.96	14.11	15.90	21.34	19.84	23.82	23.04	29.82
Tasmania ...	†8.68	†15.93	†20.95	‡20.74	18.25	17.40	17.78	17.69
C'wealth ...	25.17	23.16	21.74	29.10	31.69	35.37	37.07	34.38

* See footnote * to preceding table. † See footnote † to preceding table.
‡ See footnote ‡ to preceding table.

20. **Traffic Conditions.**—Reference has already been made to the difference in the traffic conditions on many of the lines of the Commonwealth (see paragraphs 14, 15, and 16 hereof). These conditions differ not only in the several States, but also on different lines in the same State, and this is true with regard to both passenger and goods traffic. By far the greater part of the population of Australia is confined to a fringe of country near the coast, more especially in the eastern and southern districts. A large proportion of the railway traffic between the chief centres of population is therefore carried over lines in the neighbourhood of the coast, and is thus, in some cases, open to sea-borne competition. On most of the lines extending into the more remote interior districts traffic is light ; the density of population diminishes rapidly as the coastal regions are left behind ; there is a corresponding diminution in the volume of traffic, while, in comparison with other more settled countries, there is but little back-loading.

As an indication of the different traffic conditions prevailing in the several States, the following table is given shewing the numbers of passenger journeys and the tons of

goods carried (*a*) per 100 of the mean population; and (*b*) per average mile worked in each State during the financial year 1907-8:—

PASSENGER JOURNEYS AND TONNAGE OF GOODS AND LIVE STOCK, 1907-8.

Particulars.		N.S.W.	Vic.	Q'land.	S.A.	N.T.	W.A.	Tas.	Cwlth.
(*a*) PER 100 OF MEAN POPULATION.									
Passenger journeys ...	No.	3,009	5.965	1,888	3,253	80	4,875	565	3,773
Goods and live stock ...	Tons	644	299	*439	571	97	775	°258	499
(*b*) PER AVERAGE MILE OF LINE WORKED.									
Passenger journeys ...	No.	13,689	22,057	3,217	6,901	20	7,074	2,169	11,077
Goods and live stock ...	Tons	2,933	1,105	*748	1,212	24	1,125	°990	1,467

* Exclusive of live stock.

Particulars of the actual numbers of passengers and tons of goods and live stock carried have already been given (see paragraph 5 hereof).

(i.) *Metropolitan and Country Passenger Traffic.* A further indication of the difference in passenger traffic conditions might be obtained from a comparison of the volume of metropolitan and country traffic in each State. Particulars are, however, available only for the States of New South Wales and Victoria. The subjoined table shews the number of metropolitan and country passengers carried in each of the States mentioned and the revenue derived therefrom during the year 1907-8:—

METROPOLITAN AND COUNTRY PASSENGER TRAFFIC, 1907-8.

Particulars.	Number of Passenger Journeys.			Revenue.		
	Metropolitan.	Country.	Total.	Metropolitan.	Country.	Total.
				£	£	£
N.S.W. ...	*41,404,022	6,083,008	47,487,030	*455,021	1,124,800	1,579,821
Vic. ...	†68,799,680	6,107,745	74,907,425	†686,062	1,016,008	1,702,070

* Within 22 miles of Sydney and Newcastle. † Within 20 miles of Melbourne.

From this table it may be seen that the number of passenger-journeys in country districts in Victoria is only slightly greater than the corresponding number in New South Wales, while the number of metropolitan passenger-journeys in Victoria is far greater than in New South Wales, although in the latter State both Sydney and Newcastle are included. In Sydney a larger proportion of the suburban traffic is carried by the tramway systems than in Melbourne.

(ii.) *Goods Traffic.* Particulars regarding the quantities of various classes of commodities carried on the Government railways are available for all the States except Tasmania. The following table shews the number of tons of various representative commodities carried, and the percentage of each class on the total tonnage carried during the financial year 1907-8:—

CLASSIFICATION OF COMMODITIES CARRIED, 1907-8.

State.	Minerals.	Fire-wood.	Grain and Flour.	Hay, Straw, and Chaff.	Wool.	Live Stock.	All other Commodities.	Totals.
				TONS CARRIED.				
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
New South Wales ...	[1]6,846,236	275,786	300,384	192,419	126,384	455,549	1,607,265	[1]9,804,014
Victoria	[2]445,045	603,842	490,322	267,624	73,037	405,101	1,469,890	3,754,861
Queensland ...	1,012,491	232,406	[3]27,391	[4]191,896	45,557	[5]	913,788	[6]2,423,529
South Australia ...	1,146,365	118,890	339,201	114,371	22,485	47,016	467,668	2,255,996
Western Australia...	384,349	691,465	112,252	93,962	6,719	30,179	739,815	2,058,741
				PERCENTAGE ON TOTAL TONNAGE CARRIED.				
	%	%	%	%	%	%	%	%
New South Wales ...	[1]69.83	2.81	3.06	1.96	1.29	4.65	16.40	[1]100.00
Victoria	[2]11.85	16.08	13.06	7.12	1.94	10.79	39.16	100.00
Queensland ...	41.77	9.59	[3]1.14	[4]7.92	1.80	[5]	37.70	[6]100.00
South Australia ...	50.81	5.27	15.04	5.07	0.99	2.09	20.73	100.00
W. Australia ...	[6]18.67	33.59	5.45	4.56	0.33	1.46	35.94	100.00

1. Exclusive of 371,375 tons of coal, on which only shunting and haulage are collected. 2. Coal, stone, lime, and bricks. 3. Flour only. 4. Sugar cane. 5. Not available. 6. Exclusive of live stock.

21. **Passenger-Mileage and Ton-Mileage.**—Owing to want of uniformity in the presentation of data in the Railway Reports of the several States, the useful comparisons which can be made with regard to the operations of the Government railways in the Commonwealth are to some extent limited, and it is not possible to furnish totals for the Commonwealth in respect of various important particulars. It would seem desirable, therefore, that more complete and uniform data should be presented in the Reports. It is hoped that in future years it will be possible to include in this article more complete and uniform statistics for each State and for the whole Commonwealth.

An example of want of uniformity in an important detail is the absence of information which would enable particulars regarding "passenger-mileage" (*i.e.*, the total distance travelled by passengers) and "ton-mileage" (*i.e.*, the total distance for which goods and live stock are carried) to be shewn for each State and for the Commonwealth. This information is available either wholly, or in part, for four of the States only, viz., New South Wales, South Australia, Western Australia, and Tasmania, but is not available at all for either Victoria or Queensland. Of the four States which give particulars of the nature indicated, New South Wales is the only one which furnishes the information in a classified form according to class of passengers and nature of commodities carried. The other three States supply particulars for all classes of passengers and goods together respectively. The mere record of the total number of passenger-miles and ton-miles for all classes of passengers and for all classes of goods respectively, although of considerable value, would appear to be insufficient to enable a proper analysis and criticism of the control of railway operations to be made.

(i.) *Passenger-Miles.* Particulars for the whole of the Commonwealth period regarding total "passenger-miles" are available for one State only, namely, Tasmania. For New South Wales particulars are available for suburban and extended-suburban traffic—*i.e.*, includin gall stations within 22 miles of Newcastle, within 34 miles of Sydney, and including Richmond and Branxton. For South Australia particulars are available for each year since 1901. No particulars are available for other States. In the

tables given below the average number of passengers carried per "train," etc., is obtained by dividing the number of "passenger-miles" by the number of "passenger-train-miles." The averages given for New South Wales are naturally smaller than those for the other States, since the figures for New South Wales refer to suburban and extended-suburban traffic only.

SUMMARY OF "PASSENGER-MILES," 1901 to 1908.

Year ended the 30th June.	Passenger Train Mileage.	Number of Passenger Journeys.	Total Passenger Miles.	Amount Received from Passengers.	Average Number of Passengers carried per Train.	Average Mileage per Passenger-journey.	Average Receipt per Passenger-mile.	Average Fare per Passenger-journey.
			NEW SOUTH WALES.†					
	Miles.	No.	No.	£	No.	Miles.	d.	d.
1901	*	26,041,990	164,637,780	344,873	*	6.32	0.50	3.17
1902	*	27,998,633	184,064,179	361,849	*	6.57	0.47	2.92
1903	*	29,799,186	186,802,718	381,245	*	6.27	0.49	3.07
1904	*	31,116,243	202,549,922	396,923	*	6.51	0.47	3.06
1905	*	31,855,497	204,604,352	400,944	*	6.42	0.47	3.02
1906	*	34,040,429	223,984,703	426,931	*	6.58	0.45	3.01
1907	*	37,974,993	241,835,782	462,404	*	6.37	0.46	2.92
1908	*	42,730,040	284,464,686	504,646	*	6.65	0.42	2.83
			SOUTH AUSTRALIA (PROPER).					
1905	1,489,035	9,866,621	114,378,521	312,179	77	11.61	0.65	7.59
1906	1,538,166	10,715,343	125,862,212	334,797	82	11.75	0.64	7.50
1907	1,667,324	11,497,802	138,689,171	337,916	83	12.06	0.58	7.05
1908	1,874,318	12,839,428	154,037,971	426,261	82	12.00	0.66	7.97
			TASMANIA.					
1901	352,705	777,445	19,562,939	78,327	55	25.16	0.96	24.18
1902	335,604	761,345	19,443,913	88,541	58	25.60	1.09	27.91
1903	337,773	814,483	19,372,869	93,969	57	23.78	1.16	27.69
1904‡	357,144	872,937	21,000,000	99,632	59	24.05	1.10	27.13
1905	343,868	823,911	20,692,625	95,335	60	25.16	1.10	27.77
1906	348,005	860,519	21,712,179	98,202	62	25.23	1.08	27.38
1907	357,076	951,823	23,756,101	105,555	67	24.95	1.06	26.61
1908	356,845	1,019,668	25,413,989	112,987	71	24.92	1.07	26.66

† Including all stations within 22 miles of Sydney and Newcastle and stations beyond the 22-mile area, but within 34 miles of Sydney and including Richmond and Branxton. * Not available.

‡ Partly estimated.

(ii.) *Ton-Miles.* Particulars regarding total "ton-miles" are available for each year since 1901 for the States of New South Wales, South Australia, and Tasmania; corresponding particulars for Western Australia are available for the last two years only. The average freight-paying load carried per "train" is obtained by dividing the total "ton-miles" in the third column by the goods-train mileage in the first column. In New South Wales the amount of earnings specified excludes terminals. In South Australia and Tasmania they include terminals, while in Western Australia they exclude wharfage and jetty dues, but include all other charges.

SUMMARY OF "TON-MILES," 1901 to 1908.

Year ended the 30th June.	Goods Train Mileage.	Total Tons Carried.	Total "Ton-Miles."	Earnings.	Average Freight-paying Load carried per "Train."	Average Miles per Ton.	Earnings per "Ton-miles."
			NEW SOUTH WALES.				
				£	Tons.		d.
1901	5,836,587	6,398,227	404,740,360	1,904,371	69.34	63.26	1.13
1902	6,586,032	6,163,977	436,814,308	1,947,305	66.32	70.87	1.07
1903	6,405,756	6,304,194	399,578,918	1,624,248	62.38	63.38	0.98
1904	5,304,660	6,375,949	393,094,107	1,692,966	74.10	61.65	1.03
1905	5,431,974	6,418,596	437,416,250	1,899,239	80.53	68.15	1.04
1906	6,512,145	7,335,201	478,642,156	2,268,321	73.50	65.25	1.14
1907	7,294,165	8,472,012	564,708,773	2,516,038	77.42	66.66	1.07
1908	7,746,484	9,804,014	617,642,314	2,597,980	79.73	63.00	1.01
			SOUTH AUSTRALIA.				
1901	2,686,789	1,628,444	202,649,157	843,019	75.42	124.44	1.00
1902	2,468,326	1,392,257	170,523,167	681,045	69.09	122.48	0.96
1903	2,311,250	1,349,617	165,357,307	703,522	71.55	122.52	1.02
1904	2,247,003	1,515,621	178,443,372	761,298	79.41	117.74	1.02
1905	2,284,071	1,681,003	201,789,124	860,037	88.35	120.04	1.02
1906	2,337,001	1,732,436	205,079,077	910,106	87.75	118.38	1.07
1907	2,666,919	2,042,939	239,854,742	1,083,504	89.94	117.41	1.08
1908	3,135,803	2,255,996	272,373,487	1,184,867	86.86	120.73	1.04
			§ WESTERN AUSTRALIA.				
1907	1,939,959	2,091,376	144,855,822	964,653	74.67	69.26	1.60
1908	1,976,204	2,058,741	142,719,559	948,373	72.22	69.32	1.59
			* TASMANIA.				
1901†	542,977	314,628	12,848,396	93,025	23.66	40.93	1.73
1902†	567,314	407,505	14,331,487	109,266	25.26	35.30	1.82
1903†	593,943	418,701	13,790,622	113,597	23.22	34.86	1.97
1904‡	609,914	425,102	14,900,000	114,361	24.43	35.05	1.84
1905	601,984	377,010	14,802,425	109,220	24.59	37.58	1.77
1906	597,913	399,487	13,625,731	104,416	22.79	25.46	1.83
1907	624,303	428,387	14,821,533	112,457	23.74	34.59	1.82
1908	671,185	465,186	17,141,045	123,493	25.54	36.84	1.73

* Exclusive of live stock. † To 31st December for years 1901, 2, and 3; to 30th June for succeeding years. ‡ Partly estimated. § Particulars for previous years not available.

(iii.) *Classification of Commodity Ton Mileage, 1908.* New South Wales is the only State for which particulars, specifying the ton-mileage and the earnings per ton-mile for various classes of commodities, are available. It is hoped that in future years it will be passible to give corresponding particulars for the other States.

The subjoined statement gives particulars for the last financial year. Miscellaneous traffic consists of timber, bark, firewood, bricks, drain-pipes, coal, road-metal in six-ton lots, agricultural and vegetable seeds in five-ton lots, and traffic of a similar nature.

A and B classes consist of lime, vegetables, tobacco leaf, caustic soda and potash, cement, copper ingots, fat and tallow, water and mining plant in six-ton lots, leather in one and three-ton lots, agricultural implements in five-ton lots, and other traffic of a similar nature.

NEW SOUTH WALES.—SUMMARY OF TON-MILEAGE FOR YEAR ENDED 30th JUNE, 1908.

Particulars.	Total Tons Carried.	Total Miles.	Average Miles per Ton.	Earnings (exclusive of Terminals).	Earnings per Ton-Mile.	Percentage on Total Tonnage.
	Tons.	1000 Miles.	Miles.	£	d.	per cent.
Coal, coke, and shale ...	6,489,594	152,098	23.44	334,469	0.53	66.19
Other minerals ...	356,642	18,156	50.91	58,702	0.78	3.64
Crude ores	117,271	10,872	92.71	23,881	0.53	1.20
Miscellaneous ...	419,586	31,365	74.75	96,099	0.74	4.28
Firewood	275,786	7,191	26.07	23,362	0.78	2.81
Fruit	44,037	4,342	98.61	16,012	0.88	0.45
Grain and flour ...	300,384	67,557	224.90	100,848	0.36	3.06
Hay, straw, and chaff ...	192,419	36,038	187.29	57,592	0.38	1.96
Frozen meat	7,635	494	64.71	2,064	1.00	0.08
General goods ...	1,821	633	347.60	6,866	2.60	0.02
A Class	493,724	51,922	105.16	218,293	1.01	5.04
B ,, ...	250,990	28,803	114.75	204,711	1.71	2.56
C ,, ...	23,955	1,219	50.90	10,255	2.02	0.24
1st Class	109,441	15,123	138.18	194,301	3.08	1.12
2nd ,, ...	91,886	16,519	179.77	269,005	3.91	0.93
3rd ,, ...	46,910	7,064	150.59	142,608	4.84	0.48
Wool Class	126,384	36,232	286.68	298,441	1.98	1.29
Live stock	455,549	132,014	289.79	540,471	0.98	4.65
Total	9,804,014	617,642	63.00	2,597,980	1.01	100.00

22. **Interest Returned on Capital Expenditure.**—It may be seen from the figures given in the table in paragraph 19 hereof, that the Government railways in Australia have, on the whole, made a substantial profit during each year since the inception of the Commonwealth, but unfortunately the community does not get the full benefit of this profit, owing to the high rates of interest at which money for railways was borrowed in the early days. Though the average rate during the year ended the 30th June, 1908, was about 3½ per cent., an average does not accurately express the position. At an early period the need of constructing railways for the sole purpose of opening up undeveloped districts was recognised, and lines were built which could not possibly pay for some years to come; as these railways always preceded population the money had to be raised at an almost speculative rate of interest, frequently amounting to 6 per cent., while the more recent loans have been effected at less than 3 per cent., hence the railways have been handicapped by a burdensome interest. At the present time also spur lines are constructed, which can scarcely be expected to instantly return revenue in excess of the expenditure, and so must, for a time at any rate, be a charge on the more developed branches of the railway systems, and tend to increase the ratio of working costs to revenue. It may be noted, however, that although the loans made for expenditure on railway construction and equipment very largely increase the amount of the public debt of the Commonwealth, forming, in fact, more than half the total debt, the money borrowed has not been sunk in undertakings which give no return, but has been expended on works which are increasingly reproductive, yielding in most cases a direct return on the capital expended, and representing a greater value than their original cost. In Europe the national debts of various countries have been incurred principally through the expenses of prolonged wars and the money has gone beyond recovery, but in Australia the

expenditure is represented to a large extent by public works which pay a direct return, which is, on the whole, greater than the amount of interest due upon capital invested. In addition to the purely commercial aspect of the figures relating to the revenue and expenditure of the Commonwealth railways, it is of great importance that the object with which many of the lines were constructed should be kept clearly in view; the anticipated advantage in building these lines has been the ultimate settlement of the country rather than the direct returns from the railways themselves, and the policy of the State Governments has been to use the railway systems of the Commonwealth for the development of the country's resources, to the maximum extent consistent with the direct payment by the customers of the railways of the cost of working and interest charges. Further, the money has been spent in developing immense agricultural, pastoral, and mineral resources, which add to the wealth of the community, while the benefits conferred in providing a cheap and convenient mode of transit, and in generally furthering the trade and the best interests of the Commonwealth, are incalculable.

(i). *Profit or Loss after Payment of Working Expenses and Interest, 1901 to 1908.* The net revenue of the Government railways in each State after payment of working expenses is shewn above, on page 716. The following table shews the amount of interest payable on expenditure from loans on the construction and equipment of the railways in each State, the actual profit or loss after deducting working expenses and interest and all other charges from the gross revenue, and the percentage of such profit or loss on the total capital cost of construction and equipment:—

GOVERNMENT RAILWAYS.—INTEREST ON LOAN EXPENDITURE, PROFIT OR LOSS, AND PERCENTAGE OF PROFIT OR LOSS ON TOTAL COST, 1901 to 1908.

State.	1900-1.	1901-2.	1902-3.	1903-4.	1904-5.	1905-6.	1906-7.	1907-8.
AMOUNT OF INTEREST ON RAILWAY LOAN EXPENDITURE.								
	£	£	£	£	£	£	£	£
New South Wales ...	1,424,940	1,434,638	1,474,473	1,484,149	1,526,948	1,541,427	1,598,710	1,649,364
Victoria	1,464,809	1,492,695	1,473,532	1,515,755	1,461,994	1,472,397	1,483,284	1,483,807
Queensland	819,084	837,205	859,986	873,006	876,568	881,414	900,827	931,791
South Australia ...	454,141	469,787	466,655	470,882	468,730	474,955	479,720	494,636
Northern Territory	45,757	47,012	46,761	46,838	46,776	46,770	46,746	46,746
Western Australia ...	225,713	234,932	257,195	277,181	308,916	323,564	333,237	342,727
Tasmania	141,725	140,550	142,550	143,190	143,890	148,263	148,488	149,106
Commonwealth ...	4,576,169	4,656,819	4,721,152	4,811,001	4,833,822	4,888,790	4,991,012	5,098,177
PROFIT OR LOSS AFTER PAYMENT OF WORKING EXPENSES, INTEREST, AND OTHER CHARGES.*								
	£	£	£	£	£	£	£	£
New South Wales ...	+105,638	— 33,321	—425,879	—306,676	— 35,079	+384,980	+610,955	+579,931
Victoria†	—202,251	—290,971	—458,761	—100,017	—102,007	+ 99,020	+176,054	— 46,458
Queensland	—560,129	—447,777	—489,138	—379,405	—277,873	—198,687	+ 16,208	— 34,646
South Australia ...	+ 53,436	— 74,129	— 14,554	+ 14,362	+ 67,800	+110,425	+227,643	+277,093
Northern Territory	— 57,192	— 69,139	— 48,275	— 43,051	— 44,416	— 45,727	— 46,008	— 46,344
Western Australia ...	+ 83,071	+ 30,127	+ 48,417	+131,279	+ 45,210	+109,127	+ 68,189	+151,466
Tasmania	—109,334	— 80,631	— 61,222	— 61,309	— 71,964	— 79,676	— 75,765	— 73,317
Commonwealth ...	—686,761	—965,841	—1,449,412	—744,817	—418,329	+379,462	+977,276	+807,725

* The positive sign indicates a profit, the negative a loss. † Allowing for payment of special expenditure and charges (see paragraph 16 above).

PERCENTAGE OF PROFIT OR LOSS TO CAPITAL COST OF CONSTRUCTION AND EQUIPMENT.*

State.	1900-1.	1901-2.	1902-3.	1903-4.	1904-5.	1905-6.	1906-7.	1907-8.
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
New South Wales ...	+0.27	—0.08	—1.02	—0.73	—0.08	+0.88	+1.36	+1.27
Victoria†	—0.50	—0.71	—1.12	—0.24	—0.25	+0.24	+0.42	—0.11
Queensland	—2.84	—2.22	—2.41	—1.81	—1.28	—0.91	+0.07	—0.15
South Australia ...	+0.41	—0.56	—0.11	+0.11	+0.50	+0.81	+1.66	+1.99
Northern Territory	—4.88	—5.96	—4.10	—3.65	—3.76	—3.87	—3.91	—3.92
Western Australia ...	+1.17	+0.41	+0.59	+1.46	+0.47	+1.09	+0.66	+1.41
Tasmania	—2.87	—2.10	—1.57	—1.57	—1.83	—2.03	—1.92	—1.84
Commonwealth ...	—0.55	—0.76	—1.12	—0.56	—0.31	+0.28	+0.71	+0.58

* The positive sign indicates a profit, the negative a loss. † Allowing for payment of special expenditure and charges (see paragraph 16 above).

23. **Passenger Fares and Goods Rates.**—Considerable reductions have been made in recent years in passenger fares and in freight rates. These fares and rates are not only changed from time to time to suit the convenience and varying necessities of the railways, but, as traffic is developed and revenue increased, they are also in many cases reduced to an extent consistent with the direct payment by the customers of the railways of the cost of working and interest charges. During the last financial year reductions were made in the rates and fares in three of the States. In Victoria reductions were made during the year in the charges for the carriage of goods and in the fares for the conveyance of passengers equivalent respectively to approximately £47,000 and £67,000, a total of approximately £114,000 per annum. In Queensland rates and fares were reduced to the extent of £100,000 per annum. The charges on the Mackay, Bowen, Cairns, Cooktown, and Normanton lines were previously on higher scales than on the larger systems, and the opportunity was taken to reduce them to the same level on all lines in the State. In Western Australia reductions were made in rates in many directions. These account to a large extent for the falling-off in revenue as compared with the previous year, more especially in respect to goods earnings (see paragraphs 12, 13, and 15 hereof). In New South Wales reductions in rates and fares made prior to July, 1907, and subsequently, operated throughout the last year to the extent of about £174,000; further reductions amounting to about £40,000 were made in the carriage of starving stock.

(i) *Passenger Fares.* On the Australian Government railways two classes are provided for passenger traffic. The fares charged may be classified as follows:—(*a*) Fares between specified stations (including suburban fares). (*b*) Fares computed according to mileage rates. (*c*) Return, season, and excursion fares. (*d*) Special fares for workingmen, school pupils, and others. Fares in class (*a*) are issued at rates lower than the ordinary mileage rates. Fares in class (*b*) are charged between stations not included in class (*a*). Generally it may be said that mileage-rate fares are computed on the basis of about two pence per mile for first-class and about 1¼ pence per mile for second-class single tickets. In Tasmania, however, the fares are computed on the general basis of 1½ pence per mile first-class, one penny per mile second-class, with one-sixth added, and a terminal charge of one penny. In New South Wales and Queensland the mileage rates are based upon a tapering principle, *i.e.*, a lower charge per mile is made for a long journey than for a short journey. First-class return fares are generally about 1½ to 1¾ times the single fare, and the second-class are about 30 to 45 per cent. lower than the first-class fares. In Tasmania, however, return fares (except excursions) are double the single fares. Excursion tickets are issued for the return journey at from about single fare to about 1¼ times the single fare. Season tickets and special fares are issued at reduced rates.

The following table shews the passenger fares for different distances charged in each State, between stations for which specific fares are not fixed :—

PASSENGER MILEAGE RATES ON GOVERNMENT RAILWAYS, 1908.

State.	For a journey of—					
	50 Miles.	100 Miles.	200 Miles.	300 Miles.	400 Miles.	500 Miles.
FIRST-CLASS SINGLE FARES.						
New South Wales	s. d. 7 10	s. d. 15 8	s. d. 30 3	s. d. 44 10	s. d. 57 4	s. d. 65 8
Victoria	8 11	18 0	35 9	53 9	71 9	89 7
Queensland	8 6	16 0	31 0	45 1	58 2	71 4
South Australia*	8 4	16 8	33 4	50 0	66 8	83 4
Western Australia	8 4	16 8	33 4	50 0	66 8	83 4
Tasmania	7 6	14 8	...	...	...	...
Average	8 3	16 3	32 9	48 9	64 1	78 8
Average per passenger-mile d.	1.98	1.96	1.96	1.95	1.92	1.89
SECOND-CLASS SINGLE FARES.						
New South Wales	s. d. 4 8	s. d. 9 5	s. d. 17 9	s. d. 26 1	s. d. 33 5	s. d. 39 8
Victoria	5 11	12 1	23 11	35 9	47 8	59 7
Queensland	5 8	10 4	19 9	28 2	35 8	43 2
South Australia*	5 3	10 5	20 10	31 3	41 8	52 1
Western Australia	5 3	10 5	20 10	31 3	41 8	52 1
Tasmania	5 0	9 9	...	...	...	...
Average	5 4	10 5	20 7	30 6	40 0	49 4
Average per passenger-mile d.	1.28	1.25	1.24	1.22	1.20	1.18

* Ordinary mileage rates are not published ; the amounts given are therefore computed from fares between specified stations.

(ii.) *Parcel Rates.* In all the States parcels may be transmitted by passenger train upon payment of the prescribed rates, which are based upon weight and distance carried. The rates vary slightly in the different States. In New South Wales they range from threepence for a parcel not exceeding 3 lbs. for any distance up to 87 miles, to fifteen shillings for a parcel weighing from 98 lbs. to 112 lbs., for a distance over 510 miles. In Victoria the charge for a parcel weighing from 84 lbs. to 112 lbs. for a distance over 450 miles is twelve shillings. The corresponding rate in Queensland is twelve shillings and sixpence ; in South Australia eleven shillings and threepence ; in Western Australia thirteen shillings ; and in Tasmania for a distance of 250 miles the rate is five shillings and sixpence.

(iii.) *Goods Rates.* The rates charged for the conveyance of goods and merchandise may generally be divided into three classes, viz. :—(*a*) Mileage rates, (*b*) District or "development" rates, and (*c*) Commodity rates. In each of the States there are a number—ranging from 5 in Tasmania to 9 in Victoria—of different classes of freight. The mileage rates are based upon a tapering principle, *i.e.*, a lower charge per ton-mile is made for a long haul than for a short haul. District rates are charged between specified stations and are somewhat lower than the mileage rates. In addition to the ordinary classification of freights under class (*a*), certain commodities, such as wool, grain, agri-

cultural produce, and crude ores, are given special rates, lower than the mileage rates, under class (*c*). Special low rates are also charged for truck loads of various commodities.

Space will not permit of anything like a complete analysis of goods rates in the several States being here given. As an indication of the range and amount of such rates the following table is given shewing for each State the charges made per ton for hauls of different distances in respect of (*a*) agricultural produce not otherwise specified; (*b*) the highest-class freight; and (*c*) the lowest-class freight:—

GOODS MILEAGE RATES ON GOVERNMENT RAILWAYS, 1908.

State.	Charge per Ton for a Haul of—					
	50 Miles.	100 Miles.	200 Miles.	300 Miles.	400 Miles.	500 Miles.
AGRICULTURAL PRODUCE.						
New South Wales	s. d. 5 0	s. d. 7 6	s. d. 9 6	s. d. 10 6	s. d. 11 4	s. d. 12 0
Victoria	5 6	9 0	11 9	13 8	15 4	17 0
Queensland	7 6	13 9	22 1	28 4	34 7	40 10
South Australia	6 2	8 9	12 11	17 1	21 3	25 5
Western Australia	7 11	11 9	15 9	21 8	28 0	30 0
Tasmania	6 9	9 8	13 10	...	...	...
Average	6 8	10 1	14 3	18 3	22 8	25 1
Average per ton-mile d.	1.60	1.21	0.86	0.73	0.68	0.60
OTHER HIGHEST-CLASS FREIGHT.						
New South Wales	39 10	54 10	108 0	131 11	144 5	160 8
Victoria	26 0	51 0	97 0	134 6	167 9	201 0
Queensland	41 8	75 0	133 4	191 8	220 10	235 5
South Australia	27 1	52 1	97 11	134 7	166 8	194 2
Western Australia	32 1	54 2	97 6	135 5	167 11	195 0
Tasmania	32 0	50 0	96 0	...	...	...
Average	33 1	56 2	105 0	145 7	173 6	197 3
Average per ton-mile d.	7.94	6.74	6.30	5.82	5.20	4.73
OTHER LOWEST-CLASS FREIGHT.						
New South Wales	5 1	8 11	14 1	18 3	22 5	24 6
Victoria	4 3	8 4	15 0	19 0	21 0	23 2
Queensland	4 7	8 9	15 0	19 2	23 4	27 6
South Australia	4 2	7 10	13 7	17 9	21 11	26 1
Western Australia	5 0	8 4	14 2	19 2	23 4	27 6
Tasmania	18 8	27 0	41 9	...	...	...
Average	6 11	11 6	18 11	18 8	22 5	24 9
Average per ton-mile d.	1.66	1.38	1.13	0.75	0.67	0.62

The classification of commodities varies in the several States. Generally the highest-class freight includes expensive, bulky, or fragile articles, while the lowest-class comprises many ordinary articles of merchandise, such as are particularly identified or connected with the primary industries of each State.

In New South Wales, for example, the highest-class freight comprises such articles as benzine and petroleum, belting, cardboard boxes, vehicles, calcium-chloride, china and glassware, drugs and medicines, electroplate ware, fireworks, furniture and household goods, guns, instruments, safes, plants, saddlery, empty tanks, and venetian blinds. In the same State the lowest-class freight comprises agricultural and vegetable seeds, asbestos, bark, barley, screenings, bisulphide of carbon, bones and bonedust, bricks and building stone, chalk, charcoal, clay, coal and coke, drain pipes and tiles, firewood, horns and hoofs, ice, scrap iron, lead, manures, rabbit-proof netting, posts and rails, and shale; while the agricultural produce class includes grain, meal, malt, bran, pollard, millet seed, green chicory root, cabbage, cauliflowers, potatoes, pumpkins, melons, turnips, other agricultural produce not otherwise specified, in "Up" transit, and also manures in "Up" or "Down" transit.

24. **Numbers and Description of Rolling Stock, 1908.**—The following table shews, so far as possible in a comparable manner, the number of locomotives and of various classes of rolling stock in use on the Government railways in each State. The figures given are subject to certain limitations, inasmuch as the classification adopted, as well as the various types of rolling stock in use, are not identical in the several States. In Victoria and Queensland, for example, the brake-vans classified under the heading of coaching vehicles are used indiscriminately for coaching and goods traffic. Again, it is believed that in New South Wales the number of passenger vehicles is really greater than that shewn, certain of the other classes of vehicles being used for composite purposes:—

CLASSIFICATION OF LOCOMOTIVES AND ROLLING STOCK, 1907-8.

State ...	N.S.W.	Victoria.		Qld.	South Australia.			N.T.	W.A.	Tasmania.		Cwlth.
Gauge...	ft. in. 4 8½	ft. in. 5 3	ft. in. 2 6	ft. in. 3 6	ft. in. 5 3	ft. in. 3 6	Tramways. ft. in. 5 3	ft. in. 3 6	ft. in. 3 6	ft. in. 3 6	ft. 2	—
1. *Locomotives.*												
Tender	567	377	...	329	*90	162	...	5	...	66	...	
Tank	129	103	8	39	67	7	...	1	...	7	5	
Total	696	480	8	368	157	169	...	6	317	73	5	2,279
2. *Coaching Stock.*												
Passenger vehicles	836	1,211	17	468	223	102	13	4	312	178	6	
,, (Joint stock)	...	11	...	...	7	...	...	...	...	...	...	
Brake vans ...	136	304	...	120	31	28	...	2	20	15	...	
,, (Joint stock)	...	4	...	...	3	...	...	...	...	...	...	
Horse boxes ...					18				54	35	...	
Carriage trucks ...										1	...	
Post office vans ...	287	224	...	99	5	46	...	1	10	...	...	
,, (Joint stock)												
Other chg. vehicles												
Total	1,259	1,754	17	687	287	176	13	7	396	229	6	4,831
3. *Goods and Live Stock Waggons.*												
Waggons	12,205	10,641	106	8,000	2,220	3,729	81	130	6,328	1,475	67	
Brake vans ...	335				59	89	...	1	132			
Departmental ...	1,023				103	118	...	6	...			
Total	13,563	10,641	106	8,000	2,382	3,936	81	137	6,460	1,475	67	46,848

* Not including 5 passenger motors.

25. **Number of Railway Employes, 1901 to 1908.**—The following table shews the number of employés in the Railway Departments of each State in the year 1901 and in each year from 1903 to 1908, inclusive, classified according to (*a*) salaried staff, and (*b*) wages staff:—

GOVERNMENT RAILWAYS.—NO. OF EMPLOYES IN RAILWAY DEPTS., 1901 to 1908.

State.	1901.		1903.		1904.		1905.		1906.		1907.		1908.	
	Salaried Staff.	Wages Staff.	Salaried Staff.	Wages Staff.	Salaried Staff.	Wages Staff.	Salaried Staff.	Wages Staff.	Salaried Staff.	Wages Staff.	Salaried Staff.	Wages Staff.	Salaried Staff.	Wages Staff.
N.S. Wales*	1,372	11,747	1,525	11,518	1,569	11,526	1,605	11,685	1,650	11,828	1,770	13,411	1,985	15,939
Victoria	1,432	10,524	1,496	10,358	1,415	9,868	1,499	11,049	1,515	11,432	1,586	12,492	1,651	12,936
Queensland	994	4,633	942	4,023	892	4,051	890	4,146	906	4,222	949	4,491	1,256	4,766
South Aust.†	—	3,855	—	3,666	—	3,567	—	3,519	—	3,520	—	5,531	—	6,326
N. Territory†	—	51	—	63	—	52	—	54	—	54	—	72	—	‡ 75
West. Aust.	876	5,407	912	5,329	910	5,837	930	5,818	928	5,480	921	4,895	802	4,805
Tasmania	178	1,252	179	1,061	181	1,153	178	980	178	1,039	177	1,030	182	1,077
C'wealth	4,852	37,469	5,054	36,018	4,967	36,054	5,102	37,251	5,177	37,575	5,403	41,922	5,876	45,924

* Exclusive of gate-keepers with free house only. † Separate returns for salaried and wages staff are not available; the number of salaried staff is included with the wages staff. ‡ Europeans, sixty-eight; Chinese and coolies, seven.

26. **Accidents.—Numbers of Killed and Injured, 1901 to 1908.**—The subjoined tables give particulars of the number of persons killed and injured through train accidents and the movement of rolling stock on the Government railways in each State for the years 1901 to 1908:—

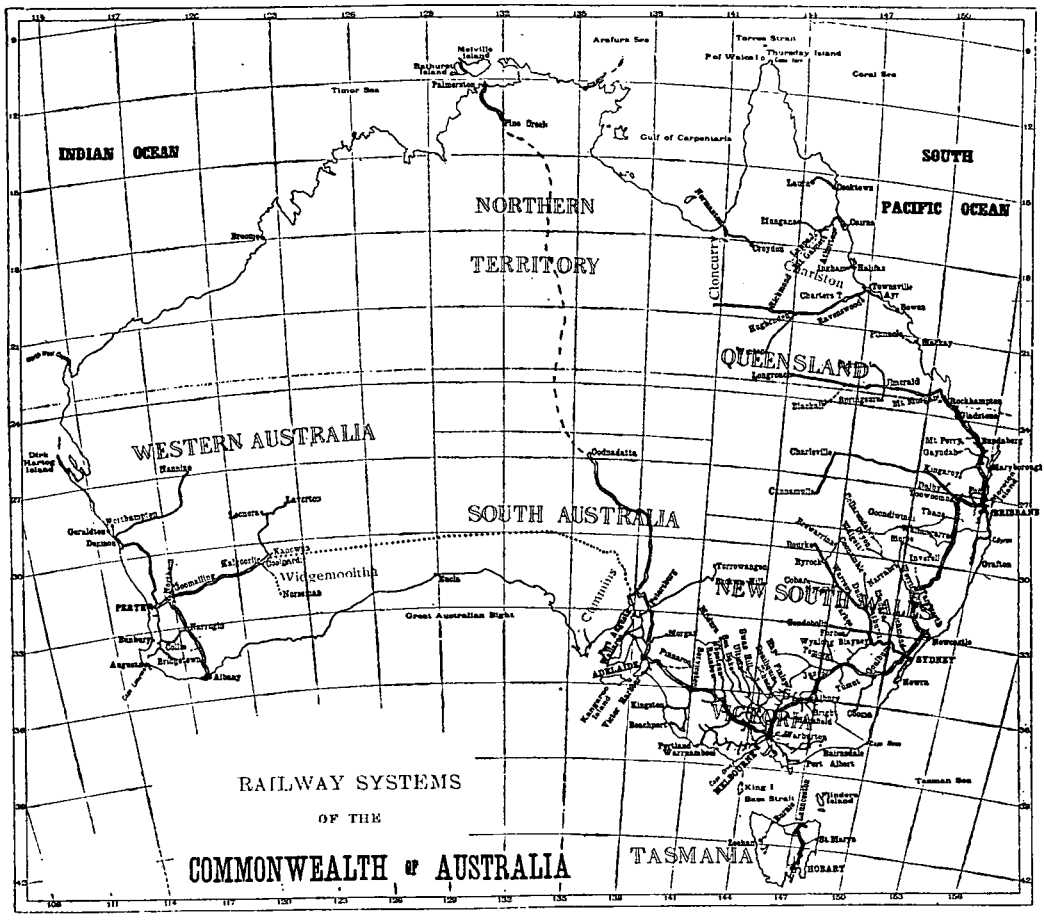
GOVERNMENT RAILWAYS.—TOTAL NUMBER OF PERSONS KILLED AND INJURED,

1900-1 TO 1907-8.

State.	1900-1.		1902-3.		1903-4.		1904-5.		1905-6.		1906-7.		1907-8.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
N.S. Wales	†	†	37	219	40	193	26	169	36	186	28	287	44	355
Victoria	46	452	40	547	28	657	25	500	60	720	55	595	90	1,105
Queensland	13	100	6	58	13	68	10	83	7	104	11	136	3	143
S. Australia	8	50	8	35	6	26	9	25	9	64	12	112	15	132
N. Territory	...	...	...	...	1	...	...	1	1	2	...	2	1	...
W. Australia*	5	205	4	228	2	238	11	405	16	320	11	257	14	271
Tasmania	1	8	1	7	3	15	1	30	1	11	3	27	2	21
C'wealth	...	...	96	1,094	93	1,197	82	1,213	130	1,407	120	1,416	169	2,027

* The returns up to and including the year 1904-5 are for accidents to servants of the Railway Department only. † Not available.

THE GOVERNMENT RAILWAY SYSTEMS OF AUSTRALIA.



EXPLANATION OF MAP.—The continuous lines in chocolate denote the existing railway lines of Australia, the heavier lines being the main routes.

Lines in course of construction are shewn by dotted lines, thus - - - - - - -

A proposed transcontinental line, joining the railways of South and Western Australia—and thus connecting continuously by railway Queensland, New South Wales, Victoria, South Australia, and Western Australia—is shewn by dots, thus . . . . . , and one connecting Oodnadatta in South Australia with Pine Creek in the Northern Territory, thus — — — —

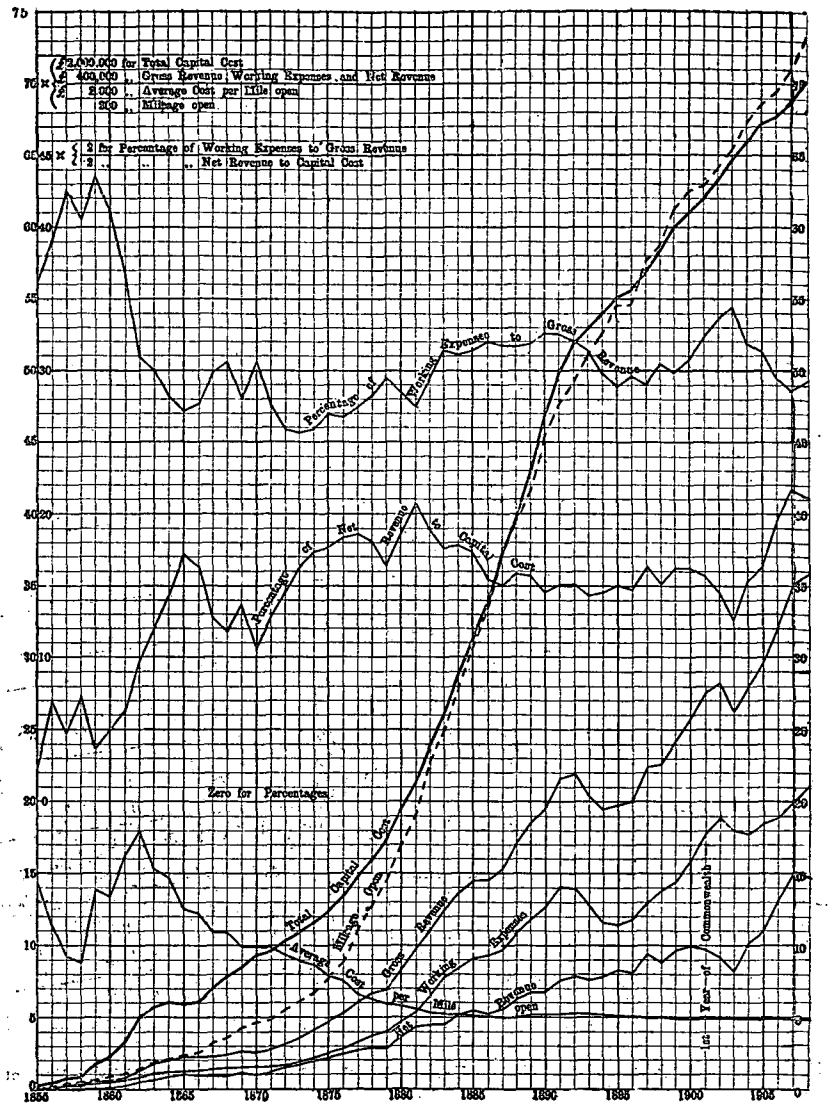
LIST OF PRINCIPAL SECTIONS OF RAILWAYS.

	Miles.
Townsville to Winton ...	368
Rockhampton to Longreach	428
Brisbane to Cunnamulla...	604
Toowoomba to Newcastle	520
Brisbane to Sydney (28 hrs.)	725
Newcastle to Inverell ...	405
Sydney to Bourke ...	508

	Miles.
Sydney to Hay	460
,, Cooma ...	266
,, Melb'rne (17 hrs.)	582½
Melb'rne to Adelaide (17¼ ,,)	482¾
,, Mildura ...	351
,, Swan Hill ...	215

	Miles.
Adelaide to Broken Hill	334
,, Oodnadatta	688
Perth to Leonora ...	536
,, Nannine ...	616
,, Albany ...	340
Hobart to Launceston ...	133

GRAPHS SHEWING THE FINANCIAL POSITION OF THE GOVERNMENT RAILWAYS OF AUSTRALIA, 1855 TO 1908.



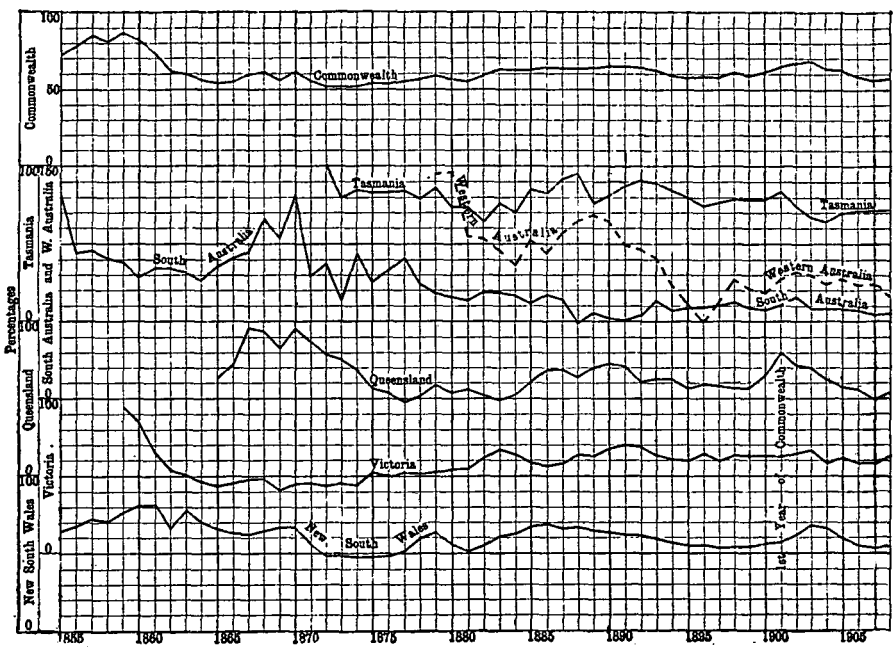
EXPLANATION OF GRAPHS.—In the above diagram the base of each small square represents throughout one year. The significance of the vertical height of each square varies, however, according to the nature of the several curves.

In the heavy curve denoting the total capital cost of the railways of the Commonwealth, each vertical side of each square denotes £2,000,000.

In the three lighter curves, representing (i.) gross revenue, (ii.) working expenses, and (iii.) net revenue, the vertical height of each single square denotes £400,000. For the curve of average cost per mile open, the vertical side of the small square denotes £2000. The mileage open is shewn by dotted curves, the vertical side of each square representing 200 miles.

For the percentages a new zero is taken at "20" on the scale for the general diagram. The vertical height of each square represents 2 per cent. in the curve shewing the percentage of working expenses on gross revenue. For the curve of percentage of net revenue on capital cost, the vertical height of each square represents only 0.2, that is to say, the vertical scale is ten times that of the preceding curve.

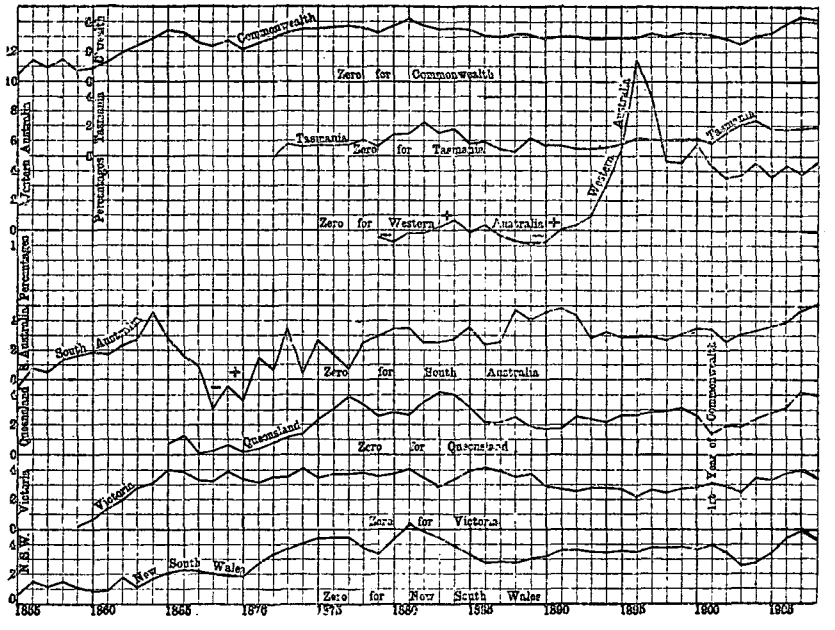
GRAPHS SHEWING PERCENTAGES OF WORKING EXPENSES TO GROSS REVENUE FOR STATES AND COMMONWEALTH, 1855 TO 1908.



EXPLANATION OF GRAPHS.—In the above diagram the base of each small square represents throughout one year. The vertical side of a small square denotes throughout 10 per cent., the heavy zero lines being different for each State and the Commonwealth, with, however, one exception, viz., that the zero line for *South and Western Australia is identical.*

The curve for Victoria commences only in 1859; that for Queensland in 1865; that for Tasmania in 1872; and that for Western Australia in 1879, these being the years in which the Government railway systems of the several States were inaugurated.

GRAPHS SHEWING PERCENTAGES OF NET REVENUE TO CAPITAL COST OF GOVERNMENT RAILWAYS FOR STATES AND COMMONWEALTH, 1855 TO 1906.



EXPLANATION OF GRAPHS.—In the above diagram the base of each small square represents throughout one year. The vertical side of a small square denotes 1 per cent., the thick zero lines, however, for each State and for the Commonwealth being different. This was necessary to avoid confusion of the curves.

Where the curve for any State falls below that State's zero line, loss is indicated, the working expenses having exceeded the gross revenue.

The curve for Victoria commences only in 1859; that for Queensland in 1865; that for Tasmania in 1872; and that for Western Australia in 1879, these being the years in which the Government railway systems of the several States were inaugurated.

(c) Graphical Representation of Government Railway Developments.

1. **General.**—Its railways are so important a factor in the development of Australia that it has been deemed desirable to graphically represent the main facts of their progress from their beginning, viz., from 1855 onwards. To this end the graphs shewn on pages 730 to 732 have been prepared. The distribution of the railways is shewn on the map on page 729.

2. **Capital Cost and Mileage Open** (page 730).—The graph shews that the ratio between these elements was, naturally enough, very variable from 1855 to 1870, consequent upon progressive decrease in cost of construction. It then became subject to a more regular change, implying reduction of average cost.

3. **Cost per Mile Open.**—The fluctuations in cost per mile open are clearly indicated by the graph on page 730. In 1855 the cost per mile open was no less than £28,430; by 1858 it had fallen to £17,752, when it rose again to a maximum of £35,958 in 1862. It then diminished rapidly till 1883—when it reached £10,496 per mile—then slowly till 1887, when it amounted to £10,017 per mile. Again rising, this rate attained to £10,537 in 1892, since which it has, on the whole, been declining, attaining its lowest value, £9550, in 1908.

4. **Gross Revenue.**—This graph (page 730) exhibits considerable irregularities, the most striking of which are the maxima at 1892 and 1902. The fall commencing in 1892 was in consequence partly of the commercial crisis and partly of the then droughty conditions of several of the States, while that of 1902-3 was due to drought. In the latter case the recovery was very rapid.

5. **Working Expenses and Net Revenue.**—The characteristics of these graphs (page 730), are similar to those of "Gross Revenue," and the same remarks apply. It may be noted, however, that the working expenses are increasing at a much slower rate than gross and net revenue.

6. **Percentage of Working Expenses to Gross Revenue.**—This is shewn for each State and for the Commonwealth on page 731, and for the Commonwealth only, on a larger scale, on page 730. The curve shews considerable fluctuations, but points also to the fact that, although a slight rise occurred in 1908, there was from 1903 to 1907 a rapid, and therefore very satisfactory, decline in the percentage of working expenses to gross revenue. The fluctuations of this percentage, for the individual States, call for no special comment.

7. **Percentage of Net Revenue on Capital Cost.**—For the Commonwealth this graph is shewn on a large scale on page 730 and on page 732 both for Commonwealth and States. After exhibiting somewhat remarkable oscillations in the earlier years, and less marked ones between 1885 and 1900, and also a rapid fall to 1903, the curve from that year shews a well marked increase until the year 1907, a slight fall occurring in the last year. Maxima were reached in 1865, 1877, 1881, and 1907—viz., 3.44, 3.71, 4.14, and 4.35 per cent.

For the individual States the results are in general very satisfactory, the increases in the percentages recently being greatest for Queensland, New South Wales, and South Australia, less marked for Victoria and Tasmania, and oscillatory for Western Australia.

The remarkable maximum for Western Australia in 1896 is consequent upon the large use made of the western railways at the time of the development of the Western Australian goldfields.

8. **General Indications of Graphs.**—Reviewing the cost of railways, as a whole, it may be noted that for the periods indicated the average cost on the entire total runs as follows:—

Period	1855-1872.	1873-1882.	1883-1892.	1893-1897.	1898-1902.	1903-1908.
Cost per mile ...	£ 24,561	£ 13,700	£ 10,286	£ 10,167	£ 9,852	£ 9,742

With the exception of the last year, when bad seasons occurred just at the time when rates had been reduced in some of the States, the percentage of working expenses on the gross revenue has lately been rapidly falling, while the percentage of net revenue on total capital cost has been rising even more rapidly. For the period 1903 to 1907 the fall in percentage of working expenses on gross revenue was from 68.80 to 57.18 per cent., while the rise of the percentage of net revenue on total capital cost was from 2.53 to 4.35 per cent.

While the sinister influence of the drought of 1902 is strikingly shewn in the curves (*a*) by the fall in the gross and net revenue in 1902 and 1903, (*b*) by the fall in the percentage of net revenue on capital cost, and (*c*) by the increase of working expenses on gross revenue, the rapidity of recovery is even more striking, and goes to indicate the great elasticity of the economic condition of the Commonwealth. Still more remarkable is the fact that a group of railways, necessarily constructed largely in accordance with a policy of widespread development of Australia's resources rather than as mere commercial enterprises, and costing so large a sum as £139,988,015 for construction and equipment up to the 30th June, 1908, should, nevertheless, yield so large a revenue, bringing in for the year 1907-8 a return, as pointed out, of no less than 4.22 per cent.

(D.)—Private Railways.

1. **Total Mileage Open, 1908.**—As has been stated in a previous part of this Section (see A. 3) a number of private railway lines have from time to time been constructed in the Commonwealth. By far the greater proportion of such lines, however, have been laid down for the purpose of hauling timber, coal, or other minerals, and are not generally used for the conveyance of passengers or for public traffic; in many cases they are often practically unballasted and are easily removable, running through bush and forest country in connection with the timber and sugar-milling industries, and for conveying firewood for mining purposes. Many of these lines may perhaps be said to be rather of the nature of tramways than of railways. Private railways referred to herein include (*a*) lines open to the public for general passenger and goods traffic; and (*b*) branch lines from Government railways and other lines which are used for special purposes and which are of a permanent description. Other lines are referred to in the part of this Section dealing with Tramways (see § 3, *Tramways*).

The following table gives particulars of private railways in the Commonwealth open for traffic up to the 30th June, 1908:—

MILEAGE OF PRIVATE RAILWAYS OPEN, 30th JUNE, 1908.

Particulars.	N.S.W.	Victoria.	Q'land.	S.A.	W.A.	Tas.	C'wealth.
For general traffic ...	144	14¼	315	...	277	165½	915¾
For Special purposes...	127	32¾	20¾	58	361½	38¾	638¾
Total ...	271	47	335¾	58	638½	204¼	1,554½

A classification of these lines according to their gauge has already been given (see A. 6).

2. **Classification of Private Railways, 1908.**—The subjoined statement gives particulars regarding private railways, so far as returns are available, in each State up to the 30th June, 1908. In this statement the lines inset are sub-branches from the main branches specified.

CLASSIFICATION OF PRIVATE RAILWAYS IN AUSTRALIA, 1908.

Railway Lines.	Gauge. ft. in.	Length Miles.	Nature of Traffic Carried, etc.
NEW SOUTH WALES.			
1. BRANCHES FROM NORTHERN LINE, N.S.W. GOVT. RLYS.—			
Aberdare Extended Cessnock	4 8½	16¾	Coal and passengers
East Greta to Stanford-Merthyr and branches ...	4 8½	8	,, ,,
Hexham-Minmi	4 8½	6	,, ,,
Brown's line to Richmond Vale	4 8½	11¼	Coal
Three other sub-branches	4 8½	5	,,
Newcastle-Wallsend Co.'s lines	4 8½	4¾	,,
Five sub-branches...	4 8½	4	,,
Waratah Coal Co.'s line	4 8½	4¼	,,
Old Burwood Pit	4 8½	7½	,,
Gunnedah Coal Co.'s line	4 8½	4½	,,
Twelve other branches	4 8½	16	Coal, coke, ores & stone
Total	4 8½	88½	
2. BRANCHES FROM NORTH-COAST LINE GOVT. RAILWAYS—			
New Redhead Coal Co.'s lines, Adamstown to Burwood Extended, and Dudley lines	4 8½	7½	Coal and passengers
Seaham Coal Co.'s lines, Seaham to Killingworth, Cockle Creek, etc.	4 8½	9½	,, ,,
Rhondda Colliery	4 8½	3	,, ,,
Nine other branches	4 8½	8¾	Coal
Total	4 8½	28¾	
3. BRANCHES FROM SOUTHERN LINE, N.S.W. GOVT. RLYS.—*			
Liverpool-Warwick Farm	4 8½	¾	Racecourse traffic
4. BRANCHES FROM S. COAST LINE, N.S.W. GOVT. RLYS.—†			
Mount Kembla Coal Co.	4 8½	7½	Coal
Corrimal and Balgownie	4 8½	3¾	,,
Australian Smelting Co., Dapto	4 8½	2½	Ores
Mount Keira Coal Co., Belmore Basin	4 8½	3	Coal
Nine other branches	4 8½	13¼	,,
Mount Pleasant Coal Co.	3 6	3¼	,,
Total	4 8½ 3 6	30¾ 3¼	
5. BRANCHES FROM WESTERN LINE, N.S.W. GOVT. RLYS.—			
Commonwealth Oil Corporation's line from Newnes Junction	4 8½	32	General
Eleven other branches	4 8½	6½	Coal, metal, and ores
Total	4 8½	38½	
6. SILVERTON TRAMWAY—			
Broken Hill and Cockburn	3 6	36	General
7. DENILIQUIN-MOAMA LINE	5 3	45	,,
Total for State	4 8½ 3 6 5 3	186½ 39½ 45	

* Three other branch private lines having a total length of 24 miles have been constructed for the conveyance of minerals, but are now closed. † The Illawarra Harbour and Land Corporation's line, 6½ miles long, constructed for general traffic, is not now working.

Railway Lines.	Gauge.	Length	Nature of Traffic Carried, etc.
***VICTORIA.**			
	ft. in.	Miles.	
1. KERANG TO KONDROOK TRAMWAY	5 3	14½	General
2. ALTONA BAY RAILWAY—			
Williamstown racecourse and pit at Altona	5 3	2¾	Sand and stone
3. CHARLOTTE PLAINS DEEP LEAD MINES—			
Maryborough-Castlemaine line to mines	5 3	2	Goods, minerals, and timber
4. McIVOR TIMBER CO.'S LINE—			
Bendigo-Wallan line into bush	5 3	24	Timber
5. SANDERSON'S TRAMWAY—			
Forrest railway station to Barwon River	3 6	4	,,
Total for State...	5 3	43	
	3 6	4	

* The Rosstown railway, running between Elsternwick and Oakleigh railway stations, about 5 miles in length, is not in use.

	QUEENSLAND.		
	ft. in.	Miles.	
1. BRANCHES FROM GREAT NORTHERN LINE, GOVT. RLYS.—			
Ayr tramway (Stuart's Creek to Ayr)	3 6	44	General (chiefly sugar)
Three other lines	3 6	2¼	Mineral traffic
2. BRANCHES FROM NORTH-COAST LINE, GOVT. RAILWAYS—			
Bundaberg to Millaquin	3 6	2	Sugar
3. BRANCH FROM WESTERN LINE, GOVT. RAILWAYS—			
Munro's tramway to Perseverance	3 6	10	Timber & farm produce
Gulland's lines to coal mines	3 6	1¾	Coal
Stafford's lines to coal mines	3 6	½	,,
4. BRANCHES FROM CAIRNS LINE, GOVT. RAILWAYS—			
Cairns-Mulgrave tramway	3 6	31	General (chiefly sugar)
Greenhill branch	2 0	4	Sugar
Chillagoe railway, Mareeba to Mungana	3 6	103	General (chiefly coal and
Mount Garnet tramways	3 6	30	,, ,, minerals
Stannary Hills tramway	3 6	21	,, ,, ,,
5. BRANCHES FROM MACKAY LINE, GOVT. RAILWAYS—			
*Pioneer shire tramway, Benholme to Kirkup ...	3 6	7½	,, (chiefly sugar)
*Pinnacle to Finch Hatton	3 6	5¾	,, ,, ,,
6. BRANCH FROM SOUTH-COAST LINE, GOVT. RAILWAYS—			
Beaudesert tramway to Innes Plain and Xmas Creek...	3 6	21	,, (chiefly timber and dairy produce
7. INGHAM TRAMWAY—			
Ingham to Stone River	2 0	18	General
8. GERALDTON TRAMWAY—			
Geraldton towards Herberton...	2 0	20	,, (chiefly sugar)
9. MOSSMAN TRAMWAY—			
Port Douglas to S. Mossman and Mowbray Rivers ...	2 0	14	,,
Total for State...	3 6	279¾	
	2 0	56	

* Worked by Commissioner of Railways on behalf of construction authorities.

	WESTERN AUSTRALIA*.		
	ft. in.	Miles.	
1. MIDLAND RAILWAY—			
Joining Govt. lines at Midland Junction and Walkaway	3 6	277	General
2. W.A. GOLDFIELDS FIREWOOD SUPPLY CO.'S LINE—			
From Kurrawang into bush	3 6	70	Firewood
3. KALGOORLIE AND BOULDER FIREWOOD CO.'S LINE†—			
From Lake Side railway station into bush	3 6	33	,,
4. W.A. JARRAH SAWMILLS LINE—			
From Kirrup to mills and into bush	3 6	12	Timber
5. TIMBER CORPORATION CO.'S LINE—			
From Greenbushes to mills and into bush	3 6	12	,,
6. S.-WEST TIMBER HEWERS' CO-OP. SOCIETY'S LINE‡—			
From Collie into bush	3 6	9¼	,,
7. MILLAR'S KARRI AND JARRAH CO.'S LINES§—			
Upper Darling Range railway, from Pickering Brook to Canning mills and bush	3 6	11½	,,
Jarrahdale and Rockingham railway, from Mundiging to Rockingham and bush	3 6	50¾	,,
Yarloop railway to mills and bush	3 6	59¾	,,
Mornington mills rly., from Wokalup to mills and bush	3 6	26¾	,,
Ferguson River railway, from Dardanup to mills and into bush	3 6	25¾	,,
Karridale railway, to Hamelin and Flinders Ports from Karridale and into bush	3 6	51	,,
Total for State...	3 6	638½	

* To the 31st December, 1907. † On 31st December, 1907, there were also 45 miles, from Lancefield into the bush, under construction. ‡ In February, 1907. Two miles also under construction. § At end of 1907 there were also 4 miles under construction.

Railway Lines.	Gauge.	Length	Nature of Traffic Carried, etc.
SOUTH AUSTRALIA.			
BROKEN HILL PROPRIETARY CO.'S LINE—	ft. in.	Miles.	
Iron Knob to Spencer's Gulf	3 6	58	Carriage of iron stone flux
TASMANIA.			
1. EMU BAY RAILWAY CO.'S LINES—	ft. in.	Miles.	
Burnie to Waratah	3 6		
Guildford Junction to Brewery Junction	3 6	103½	General
Zeehan to Maestris	3 6		
2. MOUNT LYELL MINING AND RAILWAY CO.'S LINES—			
Regatta Point to Queenstown	3 6	22	"
Linda to Kelly Basin	3 6	30	"
3. SANDFLY COLLIERY CO.'S LINE—			
North-west Bay Co.'s jetty to mine	2 0	12	Minerals
4. HUON TIMBER CO.'S LINE*	3 6	13	Timber
5. TASMANIAN GOLD MINING CO.'S LINE—			
Beaconsfield to Beauty Point†	3 6	3½	Minerals and occasionally passengers
6. ZEEHAN TRAM CO.'S LINE—			
Emu Bay railway to British Queen	2 0	2¼	Minerals and occasionally passengers
7. DUCK RIVER RAILWAY—			
Leesville to Parish of Williams‡	3 6	8	Chiefly timber
8. MAGNET SILVER MINING CO.'S LINES—			
Magnet Junction to Magnet	2 0	10	Minerals and passengers
Total for State...	3 6	180	
	2 0	24¼	

* Terminal points not fixed in May, 1908, as extensions still under construction. † Also branch lines as follows:—Electric railway, 1¼ miles long, to reduction works, 2 ft. gauge; surface railways, horse, ¾ mile long, 2 ft. gauge. ‡ Extensions under construction.

3. **New South Wales.**—In this State the mileage of private railways open to the public for general traffic on the 30th June, 1908, was 144, and of lines used for special purposes was 127. Most of these lines were constructed primarily for the purpose of conveying coal from the mines to the Government railway systems.

(i.) *Private Railways Open for General Traffic.* The most important of the lines open for general traffic are as follows:—(*a*) *The Deniliquin-Moama Line.* In 1874 permission was granted by the New South Wales Government to a private company to construct a line forty-five miles long from Deniliquin, in the Riverina district, to Moama, on the Victorian boundary opposite Echuca, which is connected by rail with Melbourne. The line was opened in 1876, the land required being granted by the Government. The cost of construction and equipment up to the end of the year 1907 was £162,672. During that year 14,848 passengers and 41,718 tons of goods and live stock were carried. The company owns 4 locomotives, 10 passenger coaches, and 59 waggons. (*b*) *The Cockburn-Broken Hill Line.* This line is owned by the Silverton Tramway Company. It was opened in 1888, and connects Broken Hill with the South Australian railway system, having a total length of 36 miles. To the end of 1907 the capital expenditure was £191,105, including the cost of 16 locomotives, 16 passenger coaches, and 577 goods waggons. During that year 61,383 passengers and 937,679 tons of goods were carried. The number of employés was 278. (*c*) *East Greta Line.* This line, belonging to the East Greta Coal Mining Company, runs from East Greta Junction, on the Northern line of the Government railways, to Stanford Merthyr, a distance of 8 miles. The total capital cost to the end of 1907 was £85,085. During the year 1907 378,604 passengers and 26,306 tons of minerals, etc., were carried. The company owns 11 locomotives, 21 passenger coaches, and 16 goods waggons, the number of employés being 149 at the end of the year 1907. (*d*) *The New Redhead Coal Company's Railway.* The lines owned by this company branch from the North-coast line of the Government railways, and

run from Adamstown to Burwood Extended colliery, and from Dudley Junction to Dudley colliery, a total distance of 7½ miles. The capital cost to the end of 1907 was £82,443. The line is worked by the Railway Department, coal waggons being supplied by the coal companies using the line. (*e*) *The Seaham Coal Company's Railways.* These lines have a total length of 9½ miles. Particulars as to capital cost are not available. During the year 1907 20,066 passengers and 6820 tons of goods were carried. The company owns 6 locomotives and 5 passenger coaches, in addition to a number of coal and goods waggons. (*f*) *Hexham-Minmi Railway.* This line branches from the Northern line of the Government railways and has a length of 6 miles. Further particulars are not available. (*g*) *The Commonwealth Oil Corporation's Railway.* This line runs from Newnes Junction on the Great Western Line of the Government railways to the Company's refinery, a distance of 32 miles. Three of the Shay geared type of locomotives (see p. 707 hereof) are in use on this line. (*h*) *The Warwick Farm Line* is a short line, three-quarters of a mile in length, connecting the Government line near Liverpool with the Warwick Farm Racecourse. Government rolling-stock is used.

In addition to the lines referred to above, legislative sanction was obtained in 1890 for the construction of a private line from the flux quarries at Tarrawingee to the Broken Hill line, a distance of forty miles. The line was purchased by the Government in 1901, and was leased to the Silverton Tramway Company to work for a period of five years at an annual rent of 3 per cent. on the capital outlay.

4. **Victoria.**—In Victoria the only private railway open for general traffic is the Kerang-Kondrook tramway, opened in 1889. The cost of construction of this line to the end of 1907 was £29,013, paid out of a loan advanced by the Victorian Government. The total length is 14¼ miles. The line is at present controlled by the Kerang Shire Council, but proposals have recently been made for its transfer to the Railway Department.

A line running from Elsternwick to Oakleigh, a distance of about five miles, has been constructed by a private company, but is not in use.

5. **Queensland.**—In this State private railways open for general traffic may be grouped under two heads:—(i.) Lines constructed primarily for mining purposes, and (ii.) Shire tramways.

(i.) *Mining Railways.* (*a*) *The Chillagoe Railway.* The most important of these is the Chillagoe railway, constructed under the Mareeba to Chillagoe Railway Act 1897, and opened in 1901. This line runs from Mareeba, on the Cairns railway, to Mungana, a distance of 103 miles. The cost of construction and equipment to the end of 1907 was £394,488. During that year 47,404 passengers and 154,096 tons of goods, etc., were carried. (*b*) *The Stannary Hills Line.* This line branches from the Chillagoe railway at Boonmoo and runs to Rocky Bluff, *via* Stannary Hills, a total distance of twenty-one miles. The capital cost to the end of 1907 was £63,408. During that year 8711 passengers and 61,445 tons of goods, etc., were carried. (*c*) *The Mount Garnet Railway.* This line also branches from the Chillagoe railway at Lappa Junction, and runs for a distance of thirty miles, as far as Mount Garnet. The capital cost to the end of 1907 was about £100,000. During that year 6379 passengers and 7165 tons of goods, etc., were carried.

(ii.) *Shire Tramways.* Under Part XV. of the Local Authorities Act of 1902 provision is made whereby not less than one-third of the ratepayers in any district may petition the local authority to apply to the Governor for the constitution of a tramway area. The Governor may define the area and may also approve of the plans and specifications of the proposed tramway. The amount which may be advanced by the Government for the construction or purchase of a tramway may not exceed a sum equal to £3000 for every mile of its length. As regards repayment of loans, no sum need be paid during the first three years, but after the expiration of that period the principal and interest must be repaid by half-yearly instalments on the basis provided for by the

"Local Works Loans Act 1880 to 1899." For the purpose of raising the money to pay these instalments the local authority may levy a rate upon all ratable property within the tramway area. The money required for the tramway may be raised by the local authorities by the issue of debentures.

At the end of the year 1907 there were seven shire tramways in operation having a total length of 161 miles. Particulars are given in paragraphs 2 and 9 hereof.

6. **South Australia.**—In this State there are no private railways open for general traffic. The only private line is that owned by the Broken Hill Proprietary Company, running from Iron Knob to the seaboard near the head of Spencer's Gulf, a distance of 58 miles. The line is used for the carriage of flux for use in connection with the smelting works at Port Pirie.

7. **Western Australia.**—Owing to the Government's past difficulty in constructing lines, urgently required for the development of the country, private enterprise was encouraged to undertake the work of construction on the land-grant principle, and two trunk lines were thus constructed. The greater part of the private lines now open, however, have been constructed in connection with the timber industry. (i.) *The Midland Railway.* This line is 277 miles in length, and runs from the Midland Junction, ten miles from Perth, to Walkaway, where it joins the Government line running to Geraldton. It was constructed under a concession of 12,000 acres of land per mile of line constructed, to be selected along the entire route of the railway. The total capital expenditure up to the year 1901 was £1,999,006, the revenue for the year 1907 being £90,256, and the expenditure £48,873. (ii.) *The Great Southern Railway.* This line, which was built by private enterprise under the land-grant system, is 243 miles in length, and was acquired by the Government by purchase on the 1st January, 1897. The total price paid, with all the interests of the private company and of the original concessionaire, was £1,100,000, which was divided by the Government for book-keeping purposes into £300,000 for the land and £800,000 for the railway. (iii.) *Millar's Karri and Jarrah Company's Lines.* These lines have mostly been built under special timber concessions and leases. There were, at the end of the year 1907, in all eight lines situated in various parts of the State extending into the bush, whence logs are brought to the mills. At the end of 1907 the total length of these lines was 294 miles, and the total capital expended was £330,945. The company owned 21 locomotives, 6 passenger coaches, and 718 goods and timber trucks. Two of these lines have recently been taken over by the Government.

8. **Tasmania.**—In this State there are three private lines open for general traffic. They are all situated in the western part of the island.

(i.) *The Emu Bay Railway Company.* The lines owned by this company run from Burnie to Waratah, from Guildford to Zeehan, and from Rayna to Maestris, and have a total length of 103½ miles. The total cost of construction and equipment to the end of 1907 was £594,419. During that year 32,935 passengers and 90,007 tons of goods were carried. The company owns 8 locomotives, 5 passenger coaches, and 140 waggons.

(ii.) *The Mount Lyell Mining and Railway Company.* The railways owned by this company run from Regatta Point, Strahan, to Queenstown, and from Kelly Basin to Linda. The former line, 22 miles in length, was constructed in 1895-6, while the latter line, 30 miles long, was taken over from the North Mount Lyell Copper Company on the amalgamation of the two companies in 1903. The line from Kelly Basin to Linda is now run only intermittently. The total cost of construction and equipment to the 30th September, 1907, was £532,724. During the year 1907, 33,850 passengers and 118,624 tons of goods and minerals were carried. The company owns 11 locomotives, 10 passenger coaches, and 174 goods waggons, trucks, and vans.

(iiii) *The Magnet Silver Mining Company's Railway.* This line runs from Magnet Junction on the Emu Bay Company's line to Magnet, a distance of 10 miles. The

capital expenditure to the end of 1907 was £21,000, including the cost of 2 locomotives, 1 passenger coach, and 4 goods waggons. During the year 1907 2679 passengers and 4046 tons of goods and minerals were carried.

9. **Operations of Private Railways 1907.**—The tabular statement given below shews particulars, so far as returns are available, for the year 1907 of all private railways open to the public for general traffic in the Commonwealth :—

PARTICULARS OF PRIVATE RAILWAYS OPEN FOR GENERAL TRAFFIC, 1907.

Line.	Miles Open.	Capital Cost.	Gross Revenue.	Expenses.		Train Miles.	Passenger Journeys.	Tons of Goods, etc.	No. of Employés.	Rolling Stock.		
				Working.	Interest.					Locos.	Coaches.	Waggons.
NEW SOUTH WALES.												
	No.	£	£	£	£	No.	No.	Tons.	No.	No.	No.	No.
Deniliquin-Moama	45	162,672	18,836	11,902	880	39,617	14,848	41,718	45	4	10	59
Silverton Tramway	36	191,105	163,655	57,428	...	181,808	61,383	937,679	278	16	16	577
East Greta Railway	8	85,085	21,131	12,017	8,509	205,000	378,604	26,306	149	11	21	16
Graham Colliery Co.	9½	*	*	*	*	8,064	20,066	6,824	27	6	5	*
New Redhead Co. ...	7½	82,443	5,497	929	3,292	*	*	*	8	...	...	...
Hexham-Minmi ...	6	*	*	*	*	9,192	*	*	9	1	5	...
Cwlth. Oil Corpor'n	32	149,780	*	*	*	*	*	*	*	4	2	†
Total§	144	671,085	209,119	82,276	12,681	443,681	474,901	1012527	516	42	59	652
VICTORIA.												
Kerang-Kondrook ...	14½	29,013	3,200	1,610	1,165	17,640	6,700	14,000	7	2	1	5
QUEENSLAND.												
Chillagoe Railway	103	394,483	110,097	33,041	...	147,804	47,404	154,006	128	6	18	90
Stannary Hills ...	21	63,408	13,624	10,511	...	40,920	8,711	61,445	54	3	2	*
Mount Garnet ...	30	100,000	5,530	4,537	5,568	16,446	6,379	7,165	14	1	1	6
Ayr Tramway ...	44	79,141	13,048	4,619	5,335	20,995	17,625	28,505	14	†	†	†
Beaudesert ...	21	58,223	4,966	2,756	2,905	17,319	9,389	10,738	15	1	2	†
Cairns-Mulgrave ...	31	96,728	15,723	9,287	4,880	50,116	60,696	85,430	39	4	6	96
Douglas-Mossman...	14	21,487	5,178	2,854	2,085	15,432	7,190	11,392	16	1	3	22
Ingham Tramway...	18	27,844	2,783	493	1,407	*	12,157	*	2	*	*	*
Cattle Ck. and McGregor's Ck. T'way	13	21,254	2,967	1,732	859	4,864	10,972	20,418	*	†	†	†
Geraldton Tramway	20	39,937	3,644	3,286	358	21,628	4,934	20,946	15	2	2	17
Total	315	902,505	177,560	73,116	23,397	335,524	185,457	400,045	297	18	34	231
WESTERN AUSTRALIA.												
Midland Railway ...	277	*	90,256	48,873	*	299,571	43,813	‡52,753	258	10	10	178
TASMANIA.												
Emu Bay Railway...	103½	594,419	65,658	31,418	20,370	149,839	32,935	‖90,007	107	8	5	140
Mt. Lyell Railway...	22	216,086	29,741	21,634	...	48,681	29,637	108,227	142	7	7	112
Nth. Mt. Lyell Rly.	30	316,638	3,801	4,994	...	8,667	4,213	10,397	17	4	3	62
Magnet Railway ...	10	21,000	2,996	2,644	...	12,000	2,679	4,046	10	2	1	4
Total	165½	1148143	102,196	60,690	20,370	219,187	69,464	212,677	276	21	16	318
Total for Cwlth.§	915¾	2750746	582,331	266,565	57,613	1315603	780,335	1692002	1,354	93	120	1,384

* Not available. † Government rolling-stock used. ‡ Exclusive of live stock. ‖ Exclusive of rolling stock and extras. § Incomplete.

§ 3. Tramways.

1. **General.**—Tramway systems are in operation in all the States of the Commonwealth, and in recent years considerable progress has been made in the adoption of electrical traction, the benefit of which is now enjoyed by a number of the principal towns of the Commonwealth.

There are also in many parts of Australia private tramway lines which are used for special purposes, usually in connection with the timber, mining, or milling industries. Though efforts have been made to collect particulars of these lines, the returns are generally too incomplete for publication.

(i.) *Total Mileage Open and Classification of Lines.* The following table shews the total mileage of tramway lines open for general passenger traffic in each State and in the Commonwealth at the end of the year 1908, classified (*a*) according to the motive power utilised and (*b*) according to the nature of the authority by which the lines are controlled:—

TRAMWAYS.—CLASSIFICATION OF MILEAGE OPEN FOR PASSENGER TRAFFIC, 1908.

Nature of Motive Power or Controlling Authority.	N.S. Wales.	Victoria.	Q'land.	*South Australia.	Western Australia.	Tas.	C'wealth.
ACCORDING TO MOTIVE POWER.							
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
Electric	91 1/8	35	30 3/4	—	45 1/4	9	211 1/8
Steam	48 3/4	1	—	—	—	—	49 3/4
Cable	—	45 3/4	—	—	—	—	45 3/4
Horse	—	13	—	23 1/4	25 1/2	—	61 3/4
Total	139 7/8	94 3/4	30 3/4	23 1/4	70 3/4	9	368 3/8
ACCORDING TO CONTROLLING AUTHORITY.							
Government ...	132 7/8	5 1/8	—	17 1/4	23	—	178 1/4
Municipal	—	—	—	—	6 1/2	—	6 1/2
Private	7	89 5/8	30 3/4	6	41 1/4	9	183 5/8
Total	139 7/8	94 3/4	30 3/4	23 1/4	70 3/4	9	368 3/8

* *Exclusive of 53 miles of single track in the metropolitan district, now in course of electrification.*

2. **New South Wales.**—In this State the tramways, with but few comparatively unimportant exceptions, are the property of the Government, and are under the control of the Railway Commissioners.

(i.) *Government Tramways.* In Sydney and suburbs the Government tramways are divided into distinct systems. There were in June, 1908, five such systems in operation within the metropolitan area, the most important being the city and suburban lines—78 miles in length—and the North Shore line—11 7/8 miles in length. Both of these systems are now operated by electricity. There are three systems on which the motive power used is steam, namely—(*a*) the line from Ashfield to Mortlake and Cabarita, 8 1/2 miles long, (*b*) the line from Kogarah to Sans Souci, nearly 5 miles in length, and (*c*) the steam tramway at Manly, 1 1/4 miles long. There are also Government steam tramways in operation at Newcastle, Broken Hill, and Parramatta.

(*a*) *Sydney Tramways.* The first tramway constructed in Sydney ran from Bridge-street to Hay-street *via* Hunter-street. It was opened in September, 1879, and the motive power was steam. In the following few years these steam tramways were considerably extended. The electric system was not introduced into the city until the close of the year 1899, though it had at that time been in operation for some years in North Sydney. The tramways in the heart of the city, running along King-street to the suburb of Woollahra, as well as those in North Sydney, were originally worked by underground cables, and have since been converted into electric lines on the overhead trolley system. In December, 1899, the electric tramway, extending from the Circular Quay along George-street to the Redfern Station, and thence to the densely-populated district of Pyrmont, was opened for traffic. This tramway is a double track, and is 3¼ miles in length. Single lines have been constructed along Castlereagh and Pitt streets, with the object of relieving the traffic along George-street. The whole of the steam tramways in Sydney and suburbs, with the exception of the Ashfield-Mortlake, the Kogarah-Sans Souci, and the Manly lines, have now been converted into electric lines, and provision for the extra power required for the electrification of the first two of these lines has been made at the central station.

(*b*) *Other Tramway Systems.* In Newcastle the first section of the tramways, from Perkins-street to Plattsburg, was opened in 1887; the total length open on the 30th June, 1907, was 17⅛ miles. At Broken Hill and Parramatta the first sections of the tramways were opened in 1902. On the 30th June, 1907, the mileage open at Broken Hill amounted to 6¾, and at Parramatta to 4½ miles. On the same date the total length of all Government tramways open for traffic was 132¾ miles, the capital cost of construction and equipment of these lines being £3,732,991. There were also 20⅛ miles of line under construction, while further extensions amounting in all to 16 miles had been authorised. There are also three short lengths of tramways in New South Wales run by private companies. Further particulars are given below.

(*c*) *Particulars of all Government Tramways, 1901 to 1908.* The following table shews the total length, the capital cost, the gross revenue, working expenses, and net earnings, and the percentages of working expenses on gross revenue, and of net earnings on capital cost for each financial year from 1900-1 to 1907-8, inclusive.

The net result of the year 1907-8, after providing for all working expenses and £134,504 interest on the capital invested, was a surplus of £68,425, as compared with £48,961 for the previous year:—

NEW SOUTH WALES.—PARTICULARS OF WORKING OF GOVERNMENT TRAMWAYS, 1901 TO 1908.

Year ended the 30th June.	Total Length of Lines Open.	Capital Expended on Lines Open.	Gross Revenue.	Working Expenses.	Net Earnings.	Percentage of Working Expenses on Gross Revenue.	Percentage of Net Earnings on Capital Cost.
	Miles.	£	£	£	£	per cent.	per cent.
1901 ...	79¼	2,194,493	551,674	462,471	89,203	83.83	4.07
1902 ...	104	2,829,363	631,757	541,984	89,773	85.79	3.19
1903 ...	124½	3,371,587	752,034	654,165	97,869	86.98	2.90
1904 ...	125¾	3,471,759	802,985	673,625	129,360	83.89	3.73
1905 ...	125¾	3,637,922	813,569	685,682	127,887	84.28	3.51
1906 ...	126	3,669,096	851,483	665,083	186,400	78.11	5.08
1907 ...	128¾	3,669,524	908,701	727,947	180,754	80.11	4.92
1908 ...	132¾	*3,732,991	1,011,994	809,065	202,929	79.95	5.44

* £44,770 of this sum has been paid from the Consolidated Revenue, and no interest is payable thereon.

(*d*) *Particulars of Different Systems of Government Tramways, 1907-8.* In the subjoined statement particulars are given of the working of the electric, steam, and horse tramways in Sydney, and of the other Government tramways at Newcastle, Broken Hill, and Parramatta :—

NEW SOUTH WALES.—PARTICULARS OF THE WORKING OF THE VARIOUS GOVERNMENT TRAMWAYS, 1907-8.

Particulars.	Sydney.			Newcastle. (Steam.)	Broken Hill. (Steam.)	Parramatta. (Steam.)	Total.
	Electric.	Steam.	Total.				
Length ... miles	89⅞	14⅝	104½	17⅛	6¾	4½	132⅞
Total cost ... ... £	3,288,480	95,479	3,383,959	248,340	70,534	30,158	3,732,991
Gross revenue ... ... £	925,224	12,030	937,254	52,789	18,926	3,025	1,011,994
Working expenses ... £	735,442	15,549	750,991	39,003	16,442	2,629	809,065
Interest ... ... £	118,300	3,476	121,776	9,069	2,558	1,101	134,504
Profit or loss* ... ... £	+71,482	—6,995	+64,487	+4,717	—74	—705	+68,425

* The positive sign indicates a profit, the negative a loss.

The total capital cost shewn in the preceding table was made up as follows :—

Permanent Way.	Rolling Stock.	Power-house, Sub-stations, and Plant.	Machinery.	Workshops.	Furniture.	Total.
£2,116,914	£723,065	£758,714	£41,547	£90,359	£2,392	£3,732,991

The average cost per mile open was £15,946 for permanent way and £12,174 for all other charges, making a total of £28,120 per mile.

During the year 1907-8, eight new extensions, amounting in all to a length of 4 miles, were opened for traffic. On the 30th June, 1908, nine extensions having a total length of 20 miles were under construction, and up to the same date eleven additional extensions, amounting to about 17 miles, had been authorised for construction.

(*e*) *Sydney Electric Tramways.* The total length of the city and suburban lines is 78 miles, and of the North Shore line 11⅞ miles, making the total length of the electric tramways in Sydney 89⅞ miles. The current for the operation of these tramways is generated at the power-house at Ultimo, which has been erected at a total cost of £758,714, including the cost of the sub-stations and plant. The current generated at the power-house is partly continuous and partly alternating, and is used both for lighting and traction purposes. The standard voltage of the continuous current is 600; the alternating current is transmitted by means of high-tension cables to sub-stations, where it is converted to continuous current at the standard voltage. The total output of the power-house, for both lighting and traction purposes, during the year 1907-8, was 41,974,191 kilowatt-hours, of which the direct-current supply was 15,250,021, and the alternating current 26,724,170 kilowatt-hours. The output for traction purposes only was 37,422,267 kilowatt-hours. The following table gives particulars of the working of the electric tramways for each financial year from 1901 to 1908, inclusive :—

NEW SOUTH WALES.—PARTICULARS OF SYDNEY ELECTRIC TRAMWAYS, 1901 TO 1908.

Year ended 30th June.	Mileage Open for Traffic (Single Track).	Total Cost of Construction and Equipment.	Gross Revenue.	Working Expenses.	Net Revenue.
	Miles.	£	£	£	£
1901	44½	1,017,321	258,161	201,149	57,012
1902	52	1,285,014	340,742	257,557	83,185
1903	113	2,610,287	560,693	420,718	139,975
1904	118¾	2,715,748	670,603	515,043	155,560
1905	133¾	3,124,140	705,132	559,565	145,567
1906	139	3,259,936	780,986	569,566	211,420
1907	141½	3,247,817	830,497	629,108	201,389
1908	146½	3,288,480	*925,224	*735,442	*189,782

Year ended 30th June.	Output of Power-house for Traction Purposes.	Tram Miles Run.	Passengers Carried.	Number of Cars in Use.	Number of Persons Employed.
	Kilowatt-hours	No.	No.	No.	No.
1901	10,043,544	3,993,407	49,068,661	337	2,173
1902	15,471,747	6,174,646	63,517,020	436	2,855
1903	25,541,560	11,183,851	100,341,281	629	3,745
1904	30,866,308	14,382,761	116,312,375	626	3,873
1905	30,196,806	14,783,256	122,626,315	682	4,069
1906	32,315,754	15,351,781	135,300,401	735	3,863
1907	33,941,485	15,630,887	144,038,105	727	4,044
1908	37,422,267	*16,517,552	*159,722,892	738	4,735

*On special occasions steam motors and cars were running to meet exceptional demands, and these figures include same.

(ii.) *Private Tramways.* There are three private tramway lines in New South Wales open for general traffic. (*a*) There is an electric tramway running from Rockdale to Brighton-le-Sands, a distance of one and a-quarter miles. This line was originally opened as a steam tramway in 1885, but was subsequently converted into electric. The total cost to the end of 1907 was £12,073. During that year the number of tram-miles run was 20,500. (*b*) A private steam tramway passes through the township of Parramatta. Commencing at the park gates, it runs as far as the Duck River, a distance of three miles, where it connects with the Parramatta River steamers, conveying passengers and goods to and from Sydney. This line was opened for traffic in 1883. (*c*) Another steam tramway runs between Fassifern and Toronto, on Lake Macquarie, a distance of two and three-quarter miles, and was first opened in 1891. The number of tram-miles run during the year 1907 was about 14,000.

Particulars regarding private tramways used for special purposes are not available.

(iii.) *Sydney Harbour Ferries.* As the ferry services on the waters of Port Jackson are mainly subsidiary to the suburban railway and tramway systems, it has been thought advisable to include them here rather than under shipping. Returns for the year 1907 were received from five companies, and shew that these companies had 62 boats in commission which were licensed to carry a total of 32,079 passengers, or an average of 517 per boat and per trip. The total number of passengers carried during the year is stated as 21,757,243, an average of nearly 60,000 per day. In addition to the ordinary passenger traffic there are two lines providing for vehicular traffic, and thus affording the only rapid means of transit between the city and the northern suburbs. The five companies employed during the year a total of 666 persons. Their capital expenditure to the end of 1907 amounted to £206,435, the gross revenue during 1907 to £200,705, and the expenditure to £140,566, thus giving a net revenue of £60,139. The

services are well managed, and the boats constructed during recent years—double-ended screwboats—are claimed to be superior in size and equipment to boats employed on similar service in any part of the world.

3. **Victoria.**—In Melbourne there are a number of tramway systems carried on under the control of various authorities, the most important being the cable system worked by the Melbourne Tramway and Omnibus Company. There are also two lines of electric tramways, one running from St. Kilda to Brighton, a distance of five and one-eighth miles, belonging to the Government, and under the control of the Railway Commissioners; the other, from Flemington Bridge to the Saltwater River and Keilor Road, a distance of seven and a-quarter miles, is run by a private company. There is also a private cable tramway, two and a-quarter miles in length, between Clifton Hill and Preston; and there are two private tramways worked by horses—one, seven miles in length, runs from Sandringham to Beaumaris, the other, one and a-half miles long, from Brunswick to Coburg. There is a short steam tramway, about one mile long, at Sorrento. There are also systems of electric tramways at Ballarat and Bendigo, constructed and run by a private company. A number of tramways have been constructed for special purposes in various parts of the State under the provisions of the Tramways Act 1890.

(i.) *Melbourne Cable Tramways.* The Melbourne Omnibus Company began its services by the initiation of the omnibus lines in 1869, and in 1878 the company changed its name to the Melbourne Tramway and Omnibus Company, with a view to the introduction of a tramway system in the city and suburbs of Melbourne. It was not, however, until the year 1883, when the Melbourne Tramway and Omnibus Company's Act was passed, that the necessary authority was given by Parliament for that purpose. Under this Act the company was empowered to construct tramways in the streets of Melbourne and suburbs, with the consent of the municipalities interested, who had the option of electing to construct the tramways themselves. All the municipalities decided to exercise the option conferred upon them, and, according to the provisions of the Act, a Tramways Trust was formed. This body, which is composed of seven members from the Melbourne City Council and one member each from the councils of eleven of the surrounding municipalities, received full power to construct tramways, and to borrow money for that purpose, secured on the municipal properties and revenues and on the tramways themselves. The Trust raised sufficient funds to pay for the construction of the tramway tracks and the engine-houses from which the cables are worked. It was required by the original Act, as amended in 1897 and 1892, to complete the tramways by the end of the year 1893, and to grant a thirty-two years' lease of the tramways to the company, dating from the 1st July, 1884—when the liability for interest on the loans commenced—and expiring on the 1st July, 1916. The company is required to find sufficient capital to build the rolling-stock and to equip the lines and engine-houses with all necessary working requisites. The company pays to the Trust annually the interest due upon the loans raised, and also a sufficient sum as a sinking or redemption fund, to repay by its accumulation the principal of the loans raised by the Trust, and at the expiration of the lease must hand back the lines in good working order to the Trust. The expenses of the Trust were paid out of the loan up to the end of the year 1903, but since that date have been paid by the company to an amount not exceeding £1000 per annum, the municipalities being liable for the remainder. The total amount the Trust was empowered to borrow was £1,650,000, which has been raised in London by means of debentures bearing interest at 4½ per cent. The premiums received amounted to £55,794, making a total of £1,705,794. This amount had been expended by the end of the year 1893, when further loan expenditure ceased. On the 1st July, 1908, the sinking fund amounted to £1,032,000. The first line—that to Richmond—was opened to traffic in November, 1885, and the work being rapidly pushed on, the others were opened at short intervals, and the whole system was completed in 1891. The complete system consists of forty-three and a-half miles of double-track cable lines, using constantly over ninety miles of wire rope, and four and a-half miles of double-track horse lines.

(a) *Particulars of Working, 1901 to 1908.* The subjoined statement shews the tram mileage, the number of passengers carried, and the revenue and expenditure for each year ended the 30th June, from 1901 to 1908, inclusive:—

MELBOURNE CABLE TRAMWAYS.—PARTICULARS OF WORKING, 1901 to 1908.

Year ended the 30th June.	Tram Mileage.	Number of Passengers Carried.	Revenue.			Working Expenses.			
			Traffic Rec'pts.	Other.*	Total.*	Wages.	Repairs & Maintenance.	Other.*	Total.*
	No.	No.	£	£	£	£	£	£	£
1901	8,964,734	47,195,647	465,427	18,025	483,452	122,014	80,006	60,480	262,500
1902	9,226,883	47,261,572	454,683	20,152	474,835	125,596	68,669	75,269	269,554
1903	9,044,282	46,832,910	432,505	30,040	462,545	127,746	60,611	56,569	244,926
1904	8,968,928	49,183,742	444,495	28,781	473,276	124,050	71,612	45,928	241,590
1905	8,932,073	50,297,357	448,740	31,066	479,806	123,803	62,177	48,395	234,375
1906	9,032,523	52,925,654	469,079	59,861	528,940	125,390	59,361	47,395	232,146
1907	9,536,397	59,069,280	507,296	39,274	546,480	140,487	69,736	54,445	264,668
1908	9,810,808	63,954,512	545,269	40,561	585,830	153,040	64,993	60,606	278,639

* Including amounts on account of omnibus lines.

(ii.) *Electric Tramways.* There are in Melbourne two electric tramway systems, namely (a) the St. Kilda-Brighton line and (b) the North Melbourne tramways.

(a) *The St. Kilda-Brighton Line.* Under the St. Kilda and Brighton Electric Street Railways Act 1904 the Board of Land and Works was authorised to construct a tramway from St. Kilda to Brighton. The amount of interest payable on the cost of the land acquired for the tramway was guaranteed by the municipalities of St. Kilda and Brighton for a period of twenty years, and authority was given by the Act to the municipalities to levy either a general or special rate not exceeding one shilling in the pound for the purpose of paying the guarantee. The profit, if any, during the first twenty years is to be set off in reduction of the guarantee. The line was opened for traffic in May, 1906, and the extension to Brighton Beach was opened in the following year. The total capital cost to the 30th June, 1908. exclusive of rolling-stock, was £42,050, and of rolling-stock was £15,473, making a total of £57,523. The subjoined statement gives particulars of the working of this line for the financial year ended the 30th June, 1908 :—

Mileage Open.	Car Mileage.	Passengers Carried.	Gross Revenue.	Working Expenses.	*Special Expenditure.	Interest.	Net Loss
			£	£	£	£	£
5.13	335,007	1,146,484	10,374	10,988	3,311	2,140	6,065

* Replacement of rolling-stock, car-shed, and equipment destroyed by fire.

(b) *The North Melbourne Tramways,* extending through the northern suburbs to the Saltwater River and to Keilor Road, were constructed by a private company, and were opened for traffic towards the end of the year 1906.

(c) *The Ballarat and Bendigo Electric Tramways* are under the control of a private company, and run along the main streets and to and from the outlying suburbs of the two towns.

(d) *Particulars of Working of all Electric Tramways, 1903 to 1907.* The following table gives particulars of the working of all electric tramways in Victoria for each year from 1903 to 1907, inclusive :—

VICTORIA.—PARTICULARS OF WORKING OF ELECTRIC TRAMWAYS, 1903 to 1907.

Year.	Current Generated for Traction Purposes at Central Stations.	Mileage Open for Traffic.	Total Cost of Construction and Equipment.	Gross Revenue.	Working Expenses.	Tram Miles Run.	Number of Passengers Carried.	Number of Cars in Use.	Number of Employés.
	Kilowatt-hrs	Miles.	£	£	£	No.	No.	No.	No.
1903	331,712	10½	106,553	†	†	326,878	1,214,323	12	55
1904	463,633	10⅝	115,309	†	†	483,027	1,749,225	12	86
1905	703,226	23⅝	191,882	†	†	699,729	2,759,868	53	210
1906	1,790,353	34	222,486*	48,554*	34,522*	1,793,647	7,037,312	78	379
1907	1,562,221*	34½	272,180*	69,296	55,740	1,963,494	7,519,361	95	338

* Incomplete; the figures given are for 27½ miles only. † Not available for publication.

(iii.) *Private Tramways for Special Purposes.* There are in Victoria a number of tramways used for special purposes, chiefly in connection with the timber, mining, and milling industries. These lines have been constructed either under authority of the Department of Public Works, pursuant to Section 36 of the Tramway Act 1890, or under leases or licenses issued by the Department of Lands and Survey, pursuant to Sections 144 and 145 of the Land Act 1901. Particulars of these lines are too incomplete for publication.

4. **Queensland.**—In this State there is a system of electric tramways running through the streets of the city and suburbs of Brisbane and controlled by a private company which has its head office in London. The total length of the Brisbane system was thirty and three-quarter miles at the end of the year 1908. There are also a number of tramways, having a total length of 640 miles, run in connection with sugar mills. Particulars of Shire tramways have been given in the part of this section dealing with private railways (see pp. 736 and 738).

(i.) *Brisbane Electric Tramways.* These tramways are run on the overhead trolley system, the voltage of the line current being 550. The total cost of construction and equipment to the end of the year 1908 was approximately £1,250,000. The following table gives particulars of these tramways for each calendar year from 1901 to 1908, inclusive:—

QUEENSLAND.—BRISBANE ELECTRIC TRAMWAYS, PARTICULARS OF WORKING, 1901 TO 1908.

Year.	Current Generated.	Mileage Open for Traffic.	Tram Miles Run.	Number of Passengers Carried.	Gross Revenue.	Working Expenses.	No. of Cars in Use.	Number of Persons Empl'yed.
	Kilowatt-hrs.	Miles.	No.	No.	£	£	No.	No.
1901...	3,192,955	21	2,756,443	16,183,801	111,483	64,710	79	375
1902...	3,852,308	24½	3,015,548	18,125,302	125,451	73,473	88	390
1903...	3,975,355	27	3,157,574	18,376,000	126,526	77,539	100	400
1904...	4,154,797	29	3,243,686	18,452,704	126,647	76,586	104	430
1905...	4,561,780	30¾	3,323,823	20,049,978	128,436	78,918	106	485
1906...	4,370,004	30¾	3,323,657	22,052,424	141,414	78,493	107	550
1907...	*	30¾	3,330,011	24,251,329	158,298	*	107	*
1908...	4,915,202	30¾	3,367,972	27,221,466	177,567	*	107†	619

* Not available. † Including 99 motors and 8 trailers.

(ii.) *Sugar-Mill Tramways.* There are a number of tramways in various parts of Queensland used in connection with the sugar-milling industry, chiefly for the purpose of hauling cane to the mills. Some of these lines are of a permanent nature, running

through sugar-cane plantations, while others are portable lines running to various farms. At the end of the year 1908, there were 28 sugar-mills running tramways. The total mileage was 640, of which 460 miles were steam and 180 miles horse tramways.

5. **South Australia.**—Up to the year 1906 there were a number of horse tramways in the principal streets of Adelaide and suburbs run by various private companies. Power to acquire part of these lines, with a view to their electrification, was given to the Adelaide Corporation by the Municipal Tramways Trust Act 1906. In accordance with the provisions of the Act, a Trust consisting of eight members, of whom two were nominated by the Governor, two elected by the City Corporation, and two each by the Suburban Corporations and the District Councils, was formed in 1907, and a length of forty-nine route miles of horse traction tramways were purchased from the private companies at a cost of £283,357. Within three years from the 31st December, 1906, the Trust is to electrify the main lines at a cost not exceeding on the average £12,000 per mile. At the commencement of the year 1909 there were fifty-three miles of single track in process of electrification. The power-house will be located at Port Adelaide, nine miles from the city. It will be equipped with three 1500-kilowatt turbo-alternators generating current at 11,000 volts, which will be stepped down and passed through rotary converters to direct current at 600 volts. The cost of construction of the whole undertaking when complete will be approximately £750,000. There are also in South Australia nineteen and three-quarters miles of Government horse tramways in country districts, worked in connection with the railway system, and six miles of private tramways used for passenger service. The subjoined statement gives various particulars of these lines:—

SOUTH AUSTRALIA.—PARTICULARS OF HORSE TRAMWAYS, 1908.

Particulars.	Length.	Gauge.	Nature of Traffic.
GOVERNMENT TRAMWAYS.			
	Miles.	ft. in.	
Moonta, Moonta Bay, and Hamley Flat	5⅓	5 3	Passengers and goods.
Gawler	1⅛	5 3	,, ,,
Victor Harbour and Breakwater ...	1	5 3	,, ,,
Dry Creek and Magazine	1	2 0	Explosives.
Magazine and Broad Creek	1½	2 0	,,
Port Broughton and Mundoora ...	10	3 6	Passengers and goods.
PRIVATE TRAMWAYS.			
Port Adelaide and Alberton	2¼	5 3	Passengers.
Glenelg and Brighton	3¾	4 8½	,,

The total length of the Government tramways referred to above is nineteen and three-quarter miles, and of the private tramways six miles. On the two private tramways mentioned 237,449 passengers were carried during the year 1907, the gross receipts amounting to £1780.

6. **Western Australia.**—In this State there are a number of horse tramways, amounting in all to a length of twenty-three miles, which are the property of the Government. Of these the most important is the line between Roeburne and Cossack, constructed on a 2 ft. gauge and under the control of the Railway Department. The length of this line is eight and a half miles. The remaining fourteen and a half miles belonging to the Government are made up of eleven short lengths varying from eight chains to four and a-half miles, worked in connection with the jetties at various ports for the purpose of providing the necessary communication between such jetties and the goods sheds or warehouses. Most of these short lines are leased at annual rentals, and they are under the supervision of the Harbour Master. Their maintenance and improvement is in the hands

of the Public Works Department. In addition to these Government lines there are electric tramway systems at Perth and Kalgoorlie carried on by private companies, and at Fremantle, under municipal control.

(i.) *Government Tramways.* Particulars as to the working of the Government horse-tramways or as to the rents received therefrom are not generally available. The following statement, however, shews particulars of the working of the Roeburne-Cossack line for the financial year ended the 30th June, 1908 :—

WESTERN AUSTRALIAN GOVERNMENT RAILWAYS.—PARTICULARS OF THE ROEBURNE-COSSACK LINE, FINANCIAL YEAR, 1907-8.

Mileage Open.	Cost of Construction and Equipment.	Gross Earnings.	Working Expenses.	Interest.	Loss.
8½	£24,827	£2,402	£2,099	£864	£561

The total loss on the working of this line since its inception to 30th June, 1908, amounted to £21,471.

(ii.) *Steam Tramways.* During the year 1908 there were four private steam tramways, having a total length of 60½ miles, working in Western Australia; only one of these was run for passenger traffic, the other three being used in connection with the timber industry. The following statement gives particulars of these lines:—

WESTERN AUSTRALIA.—PRIVATE STEAM TRAMWAYS, 1908.

Particulars.	Length	Gauge.		Terminal Points.	Nature of Traffic.
	Miles.	Ft.	in.		
Leonora-Gwalia	2½	3	6	Leonora to Gwalia ...	Passenger
Nallan Tram Wood Line	10	3	3	From Nallan into bush	Firewood
Sons of Gwalia Firewood Tramway	24	1	8	From Leonora into bush	,,
Kurramia Timber Line	24	3	6	From Kurramia into bush	,,

(iii.) *Electric Tramways.* There are now four towns in Western Australia which enjoy the benefits of electric tramway systems, namely, Perth, Fremantle, Kalgoorlie, and Boulder City.

(*a*) *The Perth Electric Tramways* were opened for traffic by a private company in 1899, and the system has since been extended to many of the outlying suburbs. On the 31st December, 1907, there were 19¾ miles of line open, the total cost of construction and equipment to that date being £443,584, exclusive of amounts paid out of revenue to a sinking fund for the redemption of debenture stock.

(*b*) *The Kalgoorlie and Boulder City Tramways* are also run by a private company, the first line being opened in 1902. In the commencement of 1904 legislative authority was given for the construction of lines in Boulder City and suburbs, and in November, 1904, the last section of the Boulder system was completeted. At the end of the year 1907 the total mileage of the whole system—in Kalgoorlie and Boulder City—amounted to 19 miles, the total cost of construction and equipment being approximately £172,000.

(*c*) *The Fremantle Tramways* were opened in November, 1905, under the control of the municipality. On the 1st August, 1907, there were 6½ miles of line open for traffic, the cost of construction and equipment at that date being £78,525.

(d) *Particulars of Working of all Electric Tramways, 1901 to 1907.* The subjoined table shews, so far as returns are available, particulars of the working of all electric tramway systems in the State for each year from 1901 to 1907, inclusive:—

WESTERN AUSTRALIA.—PARTICULARS OF ELECTRIC TRAMWAYS, 1901 to 1907.

Year.	Current Generated.	Mileage Open for Traffic.¶	Total Cost of Construction and Equipment.	Tram Miles Run.	Number of Passengers Carried.	Gross Revenue.	Working Expenses.	No. of Cars in Use.	No. of Persons Employed.
	Kilowatt-hrs.	Miles.	£	No.	No.	£	£	No.	No.
1901	...	16½	367,037	721,056	...	46,270	26,673	30	...
1902	...	17	380,861	788,120	...	56,157	32,464	30	...
1903	*1,561,804	36¼	†411,154	1,396,888	8,226,926	99,794	68,567	59	‡70
1904	*1,831,385	42	§588,129	1,590,925	9,833,212	118,269	69,586	62	266
‖1905	*2,695,277	54	§683,280	2,190,988	12,861,664	147,455	91,006	89	373
1906	*3,076,810	54½	§685,879	2,325,378	13,595,098	152,678	92,379	89	336
1907	4.049,980	45¼	§694,109	2,247,889	14,050,086	143,403	89,266	89	330

* Exclusive of Kalgoorlie tramways, for which returns are not available. † Exclusive of Kalgoorlie tramways and also of amounts paid out of revenue to sinking fund for redemption of debenture stock of the Perth Tramways Company. ‡ Exclusive of Perth tramways. § Exclusive of amounts paid out of revenue to sinking fund for the redemption of debenture stock of the Perth Tramways Company. ‖ Including returns for the Fremantle tramways for a period of ten months ended the 31st August, 1906, at which date the municipal financial year ends. ¶ For the year 1907, miles of route are given; for previous years the figures represent miles of single track.

7. **Tasmania.**—In Hobart there is a system of electric tramways, amounting in all to a length of nine miles, owned by a private company. Under the authority of the Launceston Tramway Act of 1906 the Launceston City Council entered into an agreement with a private company for the construction of a system of electric tramways in the city and suburbs of Launceston. The agreement provides that the company is to run the tramways for a period of twenty-five years, when the Council may purchase the lines and stock at cost price; the electric power required is to be supplied by the Council.

(i.) *Hobart Electric Tramways.* These tramways were opened for traffic in 1893, the total cost of construction and equipment to the 31st December, 1907, being £88,500. The following table gives particulars of the working of this system for each year from 1901 to 1907, inclusive:—

TASMANIA.—PARTICULARS OF WORKING OF HOBART ELECTRIC TRAMWAYS, 1901 to 1907.

Year.	Current Generated.	Mileage Open for Traffic.	Tram Miles Run.	Number of Passengers Carried.	Gross Revenue.	Working Expenses.	Number of Cars in Use.	Number of Persons Employed.
	Kilowatt-hours	Miles.	No.	No.	£	£	No.	No.
1901 ...	...	9	321,633	1,734,120	16,097	11,735	20	90
1902 ...	...	9	321,533	1,848,104	17,319	11,820	20	90
1903 ...	...	9	332,986	1,962,617	18,326	11,106	21	91
1904 ...	378,857	9	330,451	2,045,629	19,855	10,906	21	94
1905 ...	455,833	9	332,135	2,327,448	20,560	11,260	22	111
1906 ...	460,315	9	341,638	2,199,759	20,261	10,968	23	110
1907 ...	607,324	9	445,505	2,504,773	24,421	*13,635	22	102

* Exclusive of the sum of £4400 spent on renewal of permanent way.

8. **Electrical Traction in Commonwealth, 1907-8.**—The subjoined table gives particulars of electric tramways for each State and the Commonwealth. The returns for Tasmania, for the Ballarat and Bendigo tramways in Victoria, and for the Perth

and Kalgoorlie tramways in Western Australia, are for the calendar year 1907; for the Brisbane tramways the returns are for the calendar year 1908; and for other tramways the returns are for the financial year 1907-8. There are at present no electric tramways running in South Australia:—

ELECTRIC TRAMWAYS IN COMMONWEALTH, 1907-8.

State.	Current Generated.	Mileage (Route) open for Traffic.	Tram Miles Run.	No. of Passengers Carried.	Capital Cost.	Gross Revenue.	Working Expenses.	No. of Cars, Motors, and Trail'rs	No. of Employés.
	Kilowatt-hours.	Miles.	No.	,000 omitted.	£	£	£	No.	No.
N.S.W. ...	37,422,267	89¾	16,517,552	159,723	3,288,480	925,224	735,442	738	4,735
Victoria ...	*1,562,221	34½	1,963,494	7,519	*272,180	69,296	55,740	95	338
Queensland ...	4,915,202	30½	3,367,972	27,221	1,250,000	177,587	†80,000	107	619
West. Australia	4,049,980	45½	2,247,889	14,050	694,109	143,403	89,266	89	330
Tasmania ...	607,324	9	445,505	2,505	88,500	24,421	13,635	22	102
Commonwealth	48,556,994	209⅜	24,542,412	211,018	5,593,269	1,339,931	974,083	1,051	6,124

† Estimated.