1920.
NEW ZEALAND.

GOVERNMENT RAILWAYS SUPERANNUATION FUND.

REPORT BY THE ACTUARY, SHOWING THE RESULTS OF AN INVESTIGATION INTO THE POSITION OF THE FUND AT 31ST MARCH, 1919.

Laid on the Table of the House of Representatives by Leave.

REPORT.

INTRODUCTION.

1. IN accordance with the instructions of the Hon. the Minister of Finance, given in October last, I have made an investigation into the position of the Government Railways Superannuation Fund, and have the honour to report as follows:—

2. The fund, which was established on the 1st January, 1903, includes persons then permanently employed who elected to contribute, and all subsequent permanent employees; those taken over with the Manawatu Railway, however, were given the option of becoming contributors. The fund is administered by the Government Railways Superannuation Fund Board.

3. In certain respects the fund differs from the Public Service and the Teachers' Superannuation Funds. For example, the contributions of members who joined prior to 1908 at ages under fifty (including employees of the Manawatu Railway Company) are lower in the Railways Fund by £2 per annum per £100 of salary than in the other schemes; a contributor with less than forty years' service may retire at age sixty instead of age sixty-five, as in the other funds; the family benefits payable on death while contributing are not extended to the case of death after retiring, as in the other funds; and there is no provision for periodical actuarial valuation.

4. The prime difficulty in respect of superannuation schemes all over the world, whether public or private, arises from the fact that the employees who are already old at the commencement of a scheme cannot possibly pay for their own pensions, and unless the employer makes the proper provision for these cases from the very outset the contributions of the younger men, which should manifestly be set aside and accumulated at interest for many years, are wholly or partially absorbed in meeting them, and the whole future interest that would have been earned upon these contributions is also lost, leaving a legacy of future trouble.

5. The Railways Superannuation Fund received no subsidy from the employer (the State) for the first seven years, consequently the pensions of the older men were from the outset wrongly paid out of the immature accumulations of the younger men, apparently upon the unsound principle of treating the young men's deposits as income to be freely handed out as expenditure to the older men, instead of being jealously guarded and accumulated, somewhat like savings-bank deposits, against the maturity of the liabilities for which they were paid.

In 1911 a subsidy of £25,000 was commenced, and this has continued to the end of the period under review, with the exception of one year when a double subsidy was received by the fund. The total State contribution to the 31st March, 1919, was £250,000. The total pensions paid out to members up to the 31st March, 1919, amount to £776,299, of which, on a rough calculation, less than £360,000 has been provided by the total State subsidy and the contributions of the pensioners concerned, the balance of £416,299 being taken from the contributions of the younger men, which are wholly required, together with a certain amount of subsidy and all the interest that can possibly be earned on them, to provide their own pension.

6. The remarks in paragraphs 4 and 5 are designed to give a rough-and-ready idea of some of the more elementary aspects of the finance of a pension fund. It should be clearly understood that any examination of the accounts such as might, for example, be made by a skilled accountant is quite insufficient to enable a correct idea to be gained of the position of such a fund, because

it takes no account of the liabilities to which the fund is committed. These liabilities are deferred for periods ranging from one year to a whole lifetime, whilst the contributions to meet them are coming in in present cash, and the funds are accumulating because the liability for which they are paid lies hidden, and only emerges just when the corresponding contributions have ceased to come in.

7. A glance at the accounts of the Railways Superannuation Fund shows that the fund had increased to £377,585 by March, 1917, and that it decreased in the next two years to £363,804 at the 31st March, 1919. The increase in the funds to 1917, far from denoting solvency, did not nearly keep pace with the liabilities; whilst, on the other hand, the decrease between 1917 and 1919, while very alarming to a layman, actually arose largely from a circumstance beneficial to the fund—viz., the withdrawal of a large number of members, who released the fund from a much larger liability than is represented by the cash they drew out.

8. The object of the actuarial valuation is to weigh all the assets and liabilities, including the near and distant engagements entered into by the fund; and it may be stated that in any concern where money is paid in respect of long-deferred engagements, particularly those depending upon the duration of human life, there is no other method of approximating to the position. In making an actuarial valuation it becomes necessary to compare the weight of sums of money payable at different epochs of time and upon different contingencies, and the only practicable method of doing this is by discounting them all (with due allowance for interest, mortality, &c.) to one period of time, reducing them to common capital, or present, values.

The Valuation.

9. In making the valuation it is taken that interest at the rate of 4 per cent. per annum will be earned upon the funds during the whole future lifetime of members; that a proportion of members will leave the service and a proportion die at each age, in accordance with the pre-war experience of the fund, drawing the appropriate benefits and relieving the pension liability; and that salaries and the corresponding contributions will increase from age to age according to ratios of increase deduced from the average salaries at the 1st April, 1919, the pensions payable at retirement depending upon the same rates of salary-increase. These and other factors are more specifically set out in the appendix. In regard to the rate of interest, the rates earned for the past seven years run from £4 2s. 5d. to £4 12s. 4d. per cent.; and, while a higher rate than 4 per cent. may continue to be earned for some time, it is hardly safe to allow more than 4 per cent. for the very long period of time covered by a pension fund.

10. The result of the valuation shortly is as follows:—

	£	£
Present or discounted value of the liabilities for benefits contracted for, after allowing for interest, rates of secession and mortality of members, increases of salary, &c., as indicated above		5,582,506
Present value (on same basis) of contributions receivable from members	1,259,247	
Funds in hand at 31st March, 1919 ...	363,804	
		1,623,051
Present value of subsidies to be furnished by State		£3,959,455

At the date of the valuation the State was paying a subsidy of £25,000 per annum. This was increased last year by £50,000, making £75,000 per annum. If this amount is made permanent the position will be as follows:—

	£	£
Present value of subsidies to be furnished (as above)		3,959,455
Less present value, £25,000 per annum	625,000	
Less present value, £50,000 per annum	1,250,000	
		1,875,000
Present value of further subsidies to be found in addition to the £75,000		£2,084,455

11. As compared with the valuation made as at the 31st March, 1912, the total liability of the State is now valued at £3,959,455 (or nearly £4,000,000), as against £1,776,851 then. This increase is mainly due to the higher pay-roll and the increase in the pension-list. The pay-roll increased approximately from £1,425,117 to £2,256,369, and the average salary in the general division from £147 to £202 and in the salaried division from £182 to £240, and I need hardly say that an increase of salary given to a contributor approaching the pension age adds materially to the value of his pension and comparatively little to the value of his contributions, hence the increase in the liability. This applies also, but in a less degree, to any contributor with service prior to the increased scale of salaries coming into operation, for his pension will necessarily be computed on the new scale for past as well as future service, while the increased contributions will apply only to the future.

12. The high scale of salaries resulting from the effects of the war is the cause of very great difficulty in estimating the liabilities, as it is hard to judge the future course of the salary scale, a matter upon which so much depends. In point of fact the scale in force at the moment of writing represents an increase as compared with that of April, 1919, which will have the effect of adding still further to the liabilities.

Recommendations.

13. It will be seen from the above that if the recently increased subsidy of £75,000 is continued, this provision will still be far from adequate, even upon the assumption that it is continued in perpetuity. It is recommended that in place thereof a subsidy of £170,000 be provided, which is calculated to extinguish the existing deficiency in about seventy-five years. The amount should, of course, be subject to occasional adjustment to meet changes in the factors. As already stated, the total pay-roll of the employees included in the fund is £2,256,369 per annum, and it may be pointed out that the subsidy recommended represents approximately 7½ per cent. thereon. It is usually considered by the highest actuarial authorities that a subsidy of 5 or 6 per cent. on the pay-roll is quite a reasonable amount for an employer to pay for the undoubted benefits he gets from a pension fund. In this case the figure is somewhat higher by reason of the fact that the State (as employer) failed to make the proper contributions to the fund from the very inception, and has now to provide not only the short payments of the past, but interest thereon.

14. In this connection a great deal of assistance could be rendered by the remunerative investment of the funds. It is doubtful whether this has been realized by those in control, as witness the following comparison:—

Rates of Interest earned by Superannuation Funds.

Year.	Public Service Fund. £ s. d.	Teachers' Fund. £ s. d.	Railways Fund. £ s. d.
1913	4 6 7	5 3 5	4 6 1
1914	4 5 10	4 6 9	4 5 0
1915	4 5 4	4 4 7	4 2 5
1916	5 1 2	4 12 8	4 4 7
1917	5 3 3	4 12 4	4 12 3
1918	5 4 1	5 3 3	4 12 4
1919	5 5 10	5 8 5	4 12 4

In the case of the Public Service Fund the Board has made its own investments since the 1st January, 1916, and the arrangement in the case of the Teachers' Fund is described in the annual report for the year ended 31st December, 1918, as follows: "During the year the Board, with the consent of the Government, came to a very satisfactory arrangement with the Public Trustee for investment of the fund. On the 1st July, 1918, an allocation was made *pro rata* from the Public Trust Common Fund investments to the total amount of the Superannuation Fund on that date. The Superannuation Fund receives the interest on the investments so allocated, instead of the flat rate of interest payable on moneys in the Common Fund of the Public Trust Office. All moneys belonging to the fund now available for investment are invested at current rates of interest. The Public Trustee charges 2½ per cent. on the interest collected for his services in connection with the fund. After allowing for this commission the average rate of interest received on the 31st December last was approximately 5·2 per cent., which compares very favourably with the rate of about 4·67 per cent. previously received by the Board."

An arrangement having practically the same effect as the above, and involving even less trouble, would be for the Public Trustee to allow interest on the mean amount to the credit of the Railways Superannuation Fund at the rates earned, after allowing for losses, on the mean amount to the credit of the Common Fund. If the subsidy recommended is granted the funds will increase rapidly for some years, and it is desirable in the interest of the scheme that they should be invested to the best advantage.

15. Not only should suitable legislation be enacted to provide for the subsidy being placed on a proper footing, but it is a matter of the greatest importance that provision should be made for the periodical valuation of the fund.

Conclusion.

16. In conclusion it may hardly be necessary to point out that it is erroneous to suppose that a fund of this character exists only for the benefit of one of the two parties involved—the employer and the employees. The following remarks by the late Mr. H. W. Manly, a past president of the Institute of Actuaries, London, and a world-wide authority on pension funds, will bear repetition: "A fund maintained in a sound financial condition is, in my opinion, a blessing to both employer and employed. The employer secures a continuity of service, for the employee will think twice before he leaves a service where he has a number of years to his credit for pension, for a small additional income; and if he (the employer) makes a proper contribution to the fund, in addition to guaranteeing a good rate of interest, he secures efficiency in the service by superannuating his servants with a reasonable pension when they are no longer useful. His salary list is a good 5 per cent.—I am inclined to think in many cases nearer 10 per cent.—less than it would be if there were no fund, and I do not think, therefore, that he can reasonably object to subscribe 5 or 6 per cent. of salaries to the fund."

Percy Muter, F.I.A.,
Actuary, Government Insurance Department.

Wellington, 24th September, 1920.

APPENDIX.

TABLE I.

The Benefits and Contributions provided for by the Act.

The contributions vary according to the age at the time when the first contribution becomes payable and are as follows:—

Contributions

For contributors who joined prior to the 1st January, 1908—

Age 30 and under			3 per cent. of pay.
Over 30 and not exceeding	35		4 ,,
,, 35	,,	40	5 ,,
,, 40	,,	45	6 ,,
,, 45	,,	50	7 ,,
,, age 50			10 ,,

For contributors who joined the scheme on or after the 1st January, 1908—

Age 30 and under			5 per cent. of pay.
Over 30 and not exceeding	35		6 ,,
,, 35	,,	40	7 ,,
,, 40	,,	45	8 ,,
,, 45	,,	50	9 ,,
,, age 50			10 ,,

Benefits

I. *On attaining of Pension Age 65 with Option of retiring at Age 60 or after Forty Years' Service.*

(1.) A pension of one-sixtieth of yearly salary for each year's service, with a limit of forty-sixtieths (two-thirds) of salary. Maximum pension for entrants after 24th December, 1909, £300.

(2.) Or the option, in lieu thereof, of a return of contributions, together with any compensation the contributor may be entitled to under section 76 of the Government Railways Act, 1887.

With the consent of the Minister a contributor may retire after thirty-five years' service.

II. *On Retirement before Pension Age (on the Grounds of being Medically Unfit for Future Duty).*

(1.) A pension of one-sixtieth of yearly salary for every year of service, limited to forty-sixtieths. In the case of entrants after 24th December, 1909, maximum pension, £300.

(2.) Or the option, in lieu thereof, of a return of contributions, together with any compensation the contributor may be entitled to under section 76 of the Government Railways Act, 1887.

III. *On Retirement before Pension Age (on other Grounds than Medical Unfitness).*

(1.) On voluntary retirement or dismissal for any other reason than misconduct, a return of contributions, together with any compensation the contributor may be entitled to under section 76 of the Government Railways Act, 1887.

(2.) On dismissal for misconduct, return of contributions.

IV. *At Death, before becoming entitled to a Retiring-allowance.*

(1.) Leaving no widow or children: A return of contributions, together with any compensation the contributor is entitled to under section 76 of the Government Railways Act, 1887.

(2.) Leaving a widow:—
- (*a.*) £18 per annum during widowhood, or if she so elects,
- (*b.*) A return of such portion of the contributions and of the compensation to which the contributor was entitled as the Board, having regard to the rights of children, thinks fit.

(3.) Leaving children: 5s. weekly to each child until age 14.

V. *At Death, after becoming entitled to a Pension.*

Return of the contributions and compensation (if any) less any sums received from the Fund.

Pensions are payable by monthly instalments, and are computed on the final salary, unless the contributor has during the previous five years served in any inferior grade to that held at the time of retirement, in which case the average salary for the last seven years is taken.

TABLE II.

Statement of Progress of Active Membership.

Year.	New Members. Joining Scheme. M.	F.	Transferred from other Funds. M.	Total	Discontinued. By Death. Contributions refunded. M.	F.	Family Pension. M.	By Withdrawal or Dismissal. M.	By Pensions. Old Age or Length of Service. M.	F.	Total	Medically Unfit. M.	By Transfer to other Funds. M.	Total Discontinued.	Members contributing at End of Financial Year. M.	F.	Total.
Part 1903	3,425	1	..	3,426	3	..	3	7	8	..	8	5	..	26	3,399	1	3,400
1903–04	3,452	3	..	3,455	15	..	27	212	156	..	156	28	..	438	6,413	4	6,417
1904–05	708	..	..	708	12	..	22	205	99	1	100	15	..	354	6,768	3	6,771
1905–06	663	..	..	663	16	..	20	231	57	..	57	12	..	336	7,095	3	7,098
1906–07	841	..	..	841	17	..	20	343	58	..	58	12	..	450	7,486	3	7,489
1907–08	1,174	2	..	1,176	13	..	20	413	73	..	73	14	..	533	8,127	5	8,132
1908–09	1,325*	..	..	1,325	17	..	22	406	56	..	56	9	..	510	8,942	5	8,947
1909–10	554	..	2	556	16	..	26	394	123	..	123	6	..	565	8,933	5	8,938
1910–11	733	..	3	736	11	..	26	504	77	..	77	17	7	642	9,027	5	9,032
1911–12	857	..	4	861	13	..	19	539	52	..	52	14	8	645	9,243	5	9,248
1912–13	1,388	..	2	1,390	21	..	17	577	81	..	81	15	2	713	9,920	5	9,925
1913–14	1,223	..	3	1,226	17	..	29	580	75	..	75	10	3	714	10,432	5	10,437
1914–15	1,298	..	1	1,299	16	..	18	550	83	..	83	15	1	683	11,048	5	11,053
1915–16	1,450	..	5	1,455	65	..	22	805	59	..	59	27	12	990	11,513	5	11,518
1916–17	1,267	..	4	1,271	118	..	42	895	69	..	69	25	2	1,151	11,633	5	11,638
1917–18	632	..	2	634	146	1	51	1,000	39	..	39	31	2	1,270	10,998	4	11,002
1918–19	716	..	3	719	136	1	105	773	29	..	29	19	1	1,064	10,654	3	10,657
Totals ..	21,706	6	29	21,741	652	2	489	8,434	1,194	1	1,195	274	38	11,084	..	..	..

* Includes 335 ex-employees of Wellington and Manawatu Railway Company.

TABLE III.

Statement of Progress of Pensions.

Year.	Attainment of Pension Age or Length of Service. (Section 80, &c.) Granted. Number.	Pension.	Void by Death. Number.	Pension.	In Force. Number.	Pension.	Retired Medically Unfit. (Section 81, &c.) Granted. Number.	Pension.	Void by Death or Expiry. Number.	Pension.	In Force. Number.	Pension.
		£		£		£		£		£		£
1903–04 ..	161	9,950	1	66	160	9,884	33	1,700	5	256	28	1,444
1904–05 ..	100*	5,848	8	425	252*	15,307	15	1,046	4	483	39	2,007
1905–06 ..	56	3,788	10	672	298	18,422	12	632	3	135	48	2,503
1906–07 ..	59	3,911	17	1,020	340	21,314	12	712	9	466	51	2,750
1907–08 ..	74	5,626	12	683	402	26,257	14	852	8	416	57	3,185
1908–09 ..	53	4,816	18	1,233	437	29,840	8	485	8	444	57	3,226
1909–10 ..	123	10,066	9	502	551	39,404	7	420	2	130	62	3,517
1910–11 ..	80	6,305	27	1,598	604	44,111	17	1,325	8	421	71	4,421
1911–12 ..	54	5,229	24	1,666	634	47,674	14	605	5	237	80	4,789
1912–13 ..	81	7,650	30	2,766	685	52,558	15	903	10	450	85	5,242
1913–14 ..	74	7,958	27	1,926	732	58,590	9	790	4	148	90	5,884
1914–15 ..	84	9,344	26	1,668	790	66,266	15	1,314	7	396	98	6,802
1915–16 ..	59	6,823	30	2,448	819	70,641	27	1,945	10	603	115	8,144
1916–17 ..	69	7,977	34	2,806	854	75,812	25	1,862	10	498	130	9,508
1917–18 ..	39	4,440	34	2,927	859	77,325	32	1,885	10	506	152	10,887
1918–19 ..	29	4,090	46	3,841	842	77,574	19	1,659	12	805	159	11,741
Totals ..	1,195	103,821	353	26,247	..	..	274	18,135	115	6,394	..	..

Year.	Death of Contributor. Family Pension. (Section 82, &c.) Granted. Number.	Pension.	Void by Death or Expiry. Number.	Pension.	In Force. Number.	Pension.	Total Pensions. Granted. Number.	Pension.	Void. Number.	Pension.	In Force. Number.	Pension.
		£		£		£		£		£		£
1903–04 ..	80	1,190	6	78	74	1,112	274	12,840	12	400	262	12,440
1904–05 ..	68	989	6	78	136	2,023	183*	7,883	18	986	427	19,337
1905–06 ..	55	815	11	143	180	2,695	123	5,235	24	950	526	23,620
1906–07 ..	61	893	16	218	225	3,370	132	5,516	42	1,704	616	27,434
1907–08 ..	57	836	12	176	270	4,030	145	7,314	32	1,275	729	33,472
1908–09 ..	62	916	25	355	307	4,591	123	6,217	51	2,032	801	37,657
1909–10 ..	91	1,313	25	365	373	5,539	221	11,799	36	997	986	48,460
1910–11 ..	66	983	30	410	409	6,112	163	8,613	65	2,429	1,084	54,644
1911–12 ..	43	644	21	293	431	6,463	111	6,478	50	2,196	1,145	58,926
1912–13 ..	40	605	37	521	434	6,547	136	9,158	77	3,737	1,204	64,347
1913–14 ..	88	1,279	38	564	484	7,262	171	10,027	69	2,638	1,306	71,736
1914–15 ..	50	735	46	643	488	7,354	149	11,393	79	2,707	1,376	80,422
1915–16 ..	57	856	46	643	499	7,567	143	9,624	86	3,694	1,433	86,352
1916–17 ..	118	1,744	53	734	564	8,577	212	11,583	97	4,038	1,548	93,897
1917–18 ..	114	1,707	49	672	629	9,612	185	8,032	93	4,105	1,640	97,824
1918–19 ..	314	4,602	52	746	891	13,468	362	10,351	110	5,392	1,892*	102,783
Totals ..	1,364	20,107	473	6,639	..	..	2,833	142,063	941	39,280	..	..

* Includes one female pensioner, £51 12s. 11d.

TABLE IV.

Present Annual Pay and Contributions of Officers now in Service.

Age attained.	First Division.			Second Division.				Age attained.
	Number.	Present Annual Pay.	Present Annual Contributions.	Number.		Present Annual Pay.	Present Annual Contributions.	
	M.	£	£	M.	F.	£	£	
72	..	..	..	1	..	203	20·4	72
68	..	..	..	1	..	188	18·8	68
67	1	750	75·0	5	..	986	98·6	67
66	3	900	63·0	6	..	1,307	110·5	66
65	3	1,220	85·4	13	..	2,637	184·6	65
64	6	2,080	145·6	12	..	2,488	174·2	64
63	8	3,550	248·5	22	..	4,632	324·3	63
62	7	2,820	197·4	19	..	3,959	277·2	62
61	12	5,930	365·6	28	..	6,143	380·5	61
60	16	6,130	379·8	47	..	10,501	630·0	60
59	18	7,980	478·8	44	..	9,509	575·7	59
58	22	10,060	611·7	28	..	5,939	356·3	58
57	23	9,500	570·0	36	..	7,903	474·2	57
56	27	10,040	543·4	48	1	10,814	581·1	56
55	32	12,670	633·5	47	1	10,407	527·2	55
54	21	7,905	395·2	53	..	11,526	580·6	54
53	35	13,100	658·1	64	..	13,412	687·3	53
52	38	14,965	748·2	71	..	15,439	793·1	52
51	38	14,600	650·2	78	..	16,511	756·8	51
50	29	10,425	417·0	102	..	22,209	935·7	50
49	37	12,805	520·3	100	..	21,925	920·0	49
48	35	11,915	476·6	123	..	26,810	1,134·6	48
47	26	8,684	354·4	152	..	33,022	1,390·0	47
46	41	14,360	461·8	158	..	34,000	1,279·4	46
45	49	17,900	567·9	170	..	36,942	1,333·8	45
44	43	15,190	455·7	215	..	46,293	1,780·6	44
43	23	8,010	240·3	215	..	45,714	1,815·6	43
42	23	8,620	258·6	220	..	46,637	1,851·2	42
41	23	7,630	228·9	243	..	51,473	2,097·8	41
40	15	4,795	143·8	251	..	53,124	2,247·2	40
39	35	10,875	326·3	302	..	64,619	2,641·2	39
38	39	11,720	365·1	298	..	62,937	2,762·9	38
37	41	12,160	376·6	319	..	66,403	2,903·8	37
36	58	17,345	525·6	329	..	69,314	2,963·7	36
35	82	24,905	776·3	322	..	67,021	3,028·4	35
34	60	17,805	554·3	323	..	65,896	2,927·4	34
33	49	14,605	447·7	336	..	68,164	2,986·3	33
32	48	14,125	440·0	300	..	60,062	2,626·2	32
31	58	15,735	476·5	331	..	65,988	2,858·4	31
30	57	15,145	463·6	291	..	57,699	2,636·6	30
29	68	17,470	590·5	244	..	49,133	2,353·2	29
28	86	22,135	894·4	217	..	43,272	1,987·5	28
27	89	22,720	1,032·4	182	..	36,020	1,715·6	27
26	50	12,535	626·8	198	..	38,868	1,943·7	26
25	48	10,680	534·0	190	..	37,122	1,856·4	25
24	69	14,550	727·5	183	..	35,973	1,798·9	24
23	93	17,245	862·2	188	..	35,885	1,794·5	23
22	136	24,290	1,214·5	171	..	32,169	1,608·6	22
21	129	20,820	1,041·0	177	..	31,863	1,593·3	21
20	158	22,650	1,132·5	126	..	19,711	985·6	20
19	220	28,325	1,416·2	141	..	18,577	928·9	19
18	188	22,190	1,109·5	111	..	13,248	662·4	18
17	127	13,725	686·3	38	..	4,006	200·3	17
16	80	7,775	388·8	25	..	1,964	98·2	16
15	15	1,425	71·3	4	..	313	15·7	15
Totals	2,737	657,489	28,054·6	7,918	2	1,598,880	72,215·0	

TABLE V.

CLASSIFICATION OF NEW PENSIONS GRANTED DURING THE PERIOD FROM 1ST APRIL, 1912, TO THE 31ST MARCH, 1919, SHOWING THE AGES AT WHICH THEY WERE GRANTED.

Age at which Pension granted.	Attainment of Pension Age or Length of Service. (Section 80 G.R. Act.) Number.	Attainment of Pension Age or Length of Service. (Section 80 G.R. Act.) Amount of Pension.	Retired Medically Unfit. (Section 81.) Number.	Retired Medically Unfit. (Section 81.) Amount of Pension.	Widows and Children. (Section 82, &c.) Number.	Widows and Children. (Section 82, &c.) Amount of Pension.	Total. Number. M.	Total. Number. F.	Total. Number. Total.	Total. Amount of Pension.
	M.	£ s. d.	M.	£ s. d.		£	M.	F.	Total.	£ s. d.
67	2	107 18 0	..	..	..	..	2	..	2	107 18 0
66	12	1,932 18 0	..	..	..	..	12	..	12	1,932 18 0
65	49	5,059 8 8	1	107 5 0	1	18	50	1	51	5,184 13 8
64	14	1,327 16 3	..	..	..	..	14	..	14	1,327 16 3
63	27	3,014 9 11	..	..	1	18	27	1	28	3,032 9 11
62	33	4,128 16 3	1	138 4 0	1	18	34	1	35	4,285 0 3
61	98	10,551 9 8	1	127 8 0	..	..	99	..	99	10,678 17 8
60	166	16,692 14 5	5	505 18 0	..	..	171	..	171	17,198 12 5
59	11	1,525 12 0	12	1,145 12 0	2	36	23	2	25	2,707 4 0
58	5	555 6 0	10	1,087 7 0	3	54	15	3	18	1,696 13 0
57	3	504 4 0	4	328 6 0	1	18	7	1	8	850 10 0
56	7	1,335 16 0	9	952 16 0	..	..	16	..	16	2,288 12 0
55	2	446 13 0	10	931 7 0	..	..	12	..	12	1,378 0 0
54	5	862 3 0	9	722 1 0	5	90	14	5	19	1,674 4 0
53	1	236 13 0	3	336 16 0	4	72	4	4	8	645 9 0
52	..	..	4	327 15 0	3	54	4	3	7	381 15 0
51	..	..	7	524 18 0	3	54	7	3	10	578 18 0
50	..	..	3	194 1 0	2	36	3	2	5	230 1 0
49	..	..	4	269 10 0	5	90	4	5	9	359 10 0
48	..	..	3	192 14 0	4	72	3	4	7	264 14 0
47	..	..	2	136 15 0	6	108	2	6	8	244 15 0
46	..	..	1	28 11 0	3	54	1	3	4	82 11 0
45	..	..	2	92 18 0	2	36	2	2	4	128 18 0
44	..	..	3	258 14 0	9	162	3	9	12	420 14 0
43	..	..	4	293 0 0	8	144	4	8	12	437 0 0
42	..	..	1	52 9 0	8	144	1	8	9	196 9 0
41	..	..	2	115 8 0	7	126	2	7	9	241 8 0
40	..	..	2	95 6 0	4	72	2	4	6	167 6 0
39	..	..	2	97 12 0	10	180	2	10	12	277 12 0
38	..	..	1	66 2 0	8	144	1	8	9	210 2 0
37	..	..	1	76 8 0	9	162	1	9	10	238 8 0
36	..	..	4	202 19 0	10	180	4	10	14	382 19 0
35	..	..	6	280 14 0	13	234	6	13	19	514 14 0
34	..	..	3	83 11 0	16	288	3	16	19	371 11 0
33	..	..	2	75 3 0	9	162	2	9	11	237 3 0
32	..	..	1	49 7 0	17	306	1	17	18	355 7 0
31	..	..	2	96 7 0	9	162	2	9	11	258 7 0
30	..	..	4	82 19 0	11	198	4	11	15	280 19 0
29	..	..	1	37 2 0	15	270	1	15	16	307 2 0
28	..	..	3	106 19 0	12	216	3	12	15	322 19 0
27	..	..	3	76 11 0	11	198	3	11	14	274 11 0
26	..	..	2	42 1 0	11	198	2	11	13	240 1 0
25	..	..	..	..	7	126	..	7	7	126 0 0
24	..	..	..	..	8	144	..	8	8	144 0 0
23	..	..	..	..	7	126	..	7	7	126 0 0
22	..	..	..	..	4	72	..	4	4	72 0 0
21	..	..	3	18 6 0	2	36	3	2	5	54 6 0
20	..	..	..	..	1	18	..	1	1	18 0 0
19	..	..	..	..	1	18	..	1	1	18 0 0
17	..	..	1	0 17 0	2	36	1	2	3	36 17 0
14	..	..	..	..	8	104				104 0 0
13	..	..	..	..	18	234				234 0 0
12	..	..	..	..	30	390				390 0 0
11	..	..	..	..	22	286				286 0 0
10	..	..	..	..	34	442				442 0 0
9	..	..	..	..	33	429				429 0 0
8	..	..	..	..	43	559				559 0 0
7	..	..	..	..	42	546	239	267	506	546 0 0
6	..	..	..	..	42	546				546 0 0
5	..	..	..	..	36	468				468 0 0
4	..	..	..	..	41	533				533 0 0
3	..	..	..	..	42	546				546 0 0
2	..	..	..	..	45	585				585 0 0
1	..	..	..	..	35	455				455 0 0
0	..	..	..	..	35	455				455 0 0
Totals	435	48,281 18 2	142	10,357 17 0	781	11,528	816	542	1,358	70,167 15 2

TABLE VI.

CLASSIFICATION OF PENSIONS IN FORCE AT 31ST MARCH, 1919, SHOWING THE AGES AT WHICH THEY WERE GRANTED.

Age at which Pension granted.	Attainment of Pension Age or Length of Service. (Section 80, G.R. Act.)			Retired Medically Unfit. (Section 81.)		Widows and Children. (Section 82, &c.)		Total.			
	Number.		Amount of Pension.	Number.	Amount of Pension.	Number.	Amount of Pension.	Number.			Amount of Pension.
	M.	F.	£ s. d.	M	£ s. d.		£	M.	F.	Total.	£ s. d.
77	1	..	133 6 8	..	..	..	..	1	..	1	133 6 8
73	2	..	151 0 8	..	..	..	..	2	..	2	151 0 8
71	2	1	182 14 1	..	..	..	..	2	1	3	182 14 1
70	6	..	408 1 3	..	..	..	..	6	..	6	408 1 3
69	5	..	362 15 1	1	37 11 2	..	..	6	..	6	400 6 3
68	7	..	453 3 9	..	..	..	..	7	..	7	453 3 9
67	21	..	1,403 4 0	..	..	..	..	21	..	21	1,403 4 0
66	30	..	3,619 16 2	..	..	..	..	30	..	30	3,619 16 2
65	87	..	7,357 4 7	..	..	1	18	87	1	88	7,375 4 7
64	39	..	3,255 15 4	..	..	1	18	39	1	40	3,273 15 4
63	51	..	4,770 16 6	..	..	1	18	51	1	52	4,788 16 6
62	75	..	6,895 16 3	1	138 4 0	3	54	76	3	79	7,088 0 3
61	163	..	15,218 17 1	2	222 8 0	1	18	165	1	166	15,459 5 1
60	317	..	27,736 6 4	6	552 18 0	3	54	323	3	326	28,343 4 4
59	12	..	1,629 18 8	11	1,047 7 8	4	72	23	4	27	2,749 6 4
58	5	..	555 6 0	12	1,229 3 1	7	126	17	7	24	1,910 9 1
57	3	..	504 4 0	7	591 18 0	3	54	10	3	13	1,150 2 0
56	7	..	1,335 16 0	11	1,072 17 3	1	18	18	1	19	2,426 13 3
55	3	..	683 6 4	17	1,513 5 0	..	..	20	..	20	2,196 11 4
54	4	..	679 15 0	15	1,084 6 3	11	198	19	11	30	1,962 1 3
53	1	..	236 13 0	4	411 2 9	4	72	5	4	9	719 15 9
52	..	..	..	3	251 14 11	6	108	3	6	9	359 14 11
51	..	..	..	7	507 14 1	3	54	7	3	10	561 14 1
50	..	..	..	3	208 10 0	6	108	3	6	9	316 10 0
49	..	..	..	4	257 13 4	8	144	4	8	12	401 13 4
48	..	..	..	4	247 15 8	9	162	4	9	13	409 15 8
47	..	..	..	1	91 5 0	11	198	1	11	12	289 5 0
46	..	..	..	..	..	3	54	..	3	3	54 0 0
45	..	..	..	1	29 13 0	7	126	1	7	8	155 13 0
44	..	..	..	4	304 4 0	15	270	4	15	19	574 4 0
43	..	..	..	4	293 0 0	11	198	4	11	15	491 0 0
42	..	..	..	1	52 9 0	14	252	1	14	15	304 9 0
41	..	..	..	2	115 8 0	11	198	2	11	13	313 8 0
40	..	..	..	3	128 3 4	8	144	3	8	11	272 3 4
39	..	..	..	2	97 12 0	11	198	2	11	13	295 12 0
38	..	..	..	3	206 1 5	10	180	3	10	13	386 1 5
37	..	..	..	..	..	14	252	..	14	14	252 0 0
36	..	..	..	6	329 12 4	15	270	6	15	21	599 12 4
35	..	..	..	4	149 16 0	18	324	4	18	22	473 16 0
34	..	..	..	1	45 1 0	19	342	1	19	20	387 1 0
33	..	..	..	2	117 9 0	12	216	2	12	14	333 9 0
32	..	..	..	1	49 7 0	18	324	1	18	19	373 7 0
31	..	..	..	1	52 5 0	10	180	1	10	11	232 5 0
30	..	..	..	3	54 16 0	13	234	3	13	16	288 16 0
29	..	..	..	1	30 0 0	20	360	1	20	21	390 0 0
28	..	..	..	2	83 16 0	11	198	2	11	13	281 16 0
27	..	..	..	3	76 11 0	11	198	3	11	14	274 11 0
26	..	..	..	1	20 17 0	14	252	1	14	15	272 17 0
25	..	..	..	1	19 16 6	6	108	1	6	7	127 16 6
24	..	..	..	..	..	8	144	..	8	8	144 0 0
23	..	..	..	..	..	7	126	..	7	7	126 0 0
22	..	..	..	..	..	4	72	..	4	4	72 0 0
21	..	..	..	3	18 6 0	2	36	3	2	5	54 6 0
17	..	..	..	1	0 17 0	2	36	1	2	3	36 17 0
14	..	..	..	..	..	2	26				26 0 0
13	..	..	..	..	..	4	52				52 0 0
12	..	..	..	..	..	13	169				169 0 0
11	..	..	..	..	..	11	143				143 0 0
10	..	..	..	..	..	24	312				312 0 0
9	..	..	..	..	..	27	351				351 0 0
8	..	..	..	..	..	40	520				520 0 0
7	..	..	..	..	..	41	533	251	263	514	533 0 0
6	..	..	..	..	..	44	572				572 0 0
5	..	..	..	..	..	41	533				533 0 0
4	..	..	..	..	..	52	676				676 0 0
3	..	..	..	..	..	52	676				676 0 0
2	..	..	..	..	..	57	741				741 0 0
1	..	..	..	..	..	51	663				663 0 0
0	..	..	..	..	..	55	715				715 0 0
Totals	841	1	77,573 16 9	159	11,740 14 9	891	13,468	1,251	641	1,892	102,782 11 6

TABLE VII.

STATEMENT OF THE STATISTICAL BASIS UPON WHICH THE VALUATION HAS BEEN MADE.

1. The proportions of contributors dying, withdrawing, and retiring at each age were got from the experience of the fund itself to the 31st March, 1912. These factors are set out in Table VIII. Owing to the disturbing effect of the war it would have been misleading to have used factors derived from later years.

2. Salaries of contributors were taken as at the 1st April, 1919, so as to include the increased salary scale which came into force as from that date, and a scale of average salaries was constructed for each of the two divisions separately. These salary scales were not themselves assumed in making the valuation, but the ratios of increase derived therefrom were applied to the actual salary of each member at the 1st April, 1919.

3. The mortality of pensioners was taken according to the experience of the Public Service, Teachers', and Railway Superannuation Funds combined, up to 1919.

4. Widows' and children's benefits were valued upon the same basis as on the last occasion—namely, New Zealand population statistics, combined with Farr's Healthy English Females Mortality.

TABLE VIII.

EXPERIENCE TABLE.

RATES PER CENT. PER ANNUM OF WITHDRAWAL, MORTALITY, RETIREMENT, AND INCREASE OF SALARY.

Age.	First Division.		Second Division.		Combined Divisions.	
	Rate of Withdrawal.	Rate of Increase of Salary.	Rate of Withdrawal.	Rate of Increase of Salary.	Rate of Mortality.	Rate of Retirement.
		£		£		
15	6·40	4·27	8·61	9·37	0·20	..
16	6·45	6·99	9·61	13·75	0·23	..
17	6·43	9·34	10·11	16·25	0·25	..
18	6·30	10·76	10·25	16·79	0·27	..
19	6·00	11·02	10·25	13·43	0·28	..
20	5·50	10·56	9·41	9·46	0·28	..
21	4·80	10·68	8·01	7·23	0·28	..
22	4·00	9·59	6·91	3·62	0·29	..
23	3·30	8·91	6·11	1·80	0·33	..
24	2·70	7·13	5·56	1·51	0·37	..
25	2·30	5·95	5·51	1·13	0·40	..
26	2·20	4·27	5·61	0·71	0·40	..
27	2·20	3·50	5·71	0·65	0·37	..
28	2·30	2·48	5·69	0·55	0·34	..
29	2·34	2·88	5·51	0·50	0·30	..
30	2·34	2·69	5·16	0·54	0·28	..
31	2·25	2·47	4·81	0·39	0·26	..
32	2·10	2·13	4·46	0·39	0·27	..
33	1·90	1·65	4·16	0·49	0·28	..
34	1·65	1·52	3·86	0·48	0·30	..
35	1·50	1·43	3·56	0·48	0·33	0·10
36	1·35	1·41	3·31	0·43	0·38	0·10
37	1·20	1·36	3·06	0·43	0·42	0·10
38	1·05	1·34	2·86	0·38	0·45	0·10
39	0·95	1·32	2·65	0·43	0·47	0·10
40	0·85	1·33	2·45	0·28	0·50	0·10
41	0·85	1·32	2·26	0·38	0·50	0·10
42	0·85	1·30	2·06	0·42	0·50	0·10
43	0·85	1·28	1·91	0·09	0·50	0·10
44	0·83	1·30	1·79	0·28	0·50	0·10
45	0·74	1·45	1·66	0·23	0·51	0·13
46	0·64	1·43	1·56	0·28	0·53	0·20
47	0·50	1·41	1·46	0·09	0·55	0·30
48	0·35	1·39	1·36	0·05	0·60	0·35
49	0·30	1·51	1·30	..	0·65	0·39
50	0·30	1·60	1·21	..	0·71	0·40
51	0·30	1·62	1·15	..	0·80	0·40
52	0·30	1·63	1·10	..	0·90	0·40
53	0·30	1·60	1·06	..	1·00	0·40
54	0·30	1·57	1·05	..	1·10	0·44
55	0·30	1·55	1·01	..	1·17	0·80
56	0·30	1·45	0·99	..	1·23	1·40
57	0·30	1·36	0·95	..	1·28	2·40
58	0·30	1·32	0·81	..	1·30	6·00
59	0·23	0·90	0·61	..	1·30	9·92
60	..	0·58	..	..	1·35	13·60
61	..	0·28	..	..	1·46	17·40
62	..	0·23	..	..	1·73	21·00
63	..	0·05	..	..	1·90	24·80
64	..	..	..	..	2·00	29·32

TABLE IX.

LIFE AND SERVICE TABLE.

Based upon the Rates per Cent. per Annum of Withdrawal, Mortality, and Retirement given in Table VIII applied to 100,000 Entrants at Age 15.

Age.	First Division. Existing in Service.	Withdrawals.	Deaths.	Retirements.	Average Salary (graduated).	Second Division. Existing in Service.	Withdrawals.	Deaths.	Retirements.	Average Salary (graduated).	Age.
					£					£	
15	100,000	6,400	199	..	96·0	100,000	8,610	199	..	81·1	15
16	93,401	6,025	215	..	100·1	91,191	8,763	211	..	88·7	16
17	87,161	5,605	219	..	107·1	82,217	8,312	206	..	100·9	17
18	81,337	5,124	219	..	117·1	73,699	7,554	199	..	117·3	18
19	75,994	4,560	213	..	129·7	65,946	6,759	185	..	137·0	19
20	71,221	3,917	200	..	144·0	59,002	5,551	165	..	155·4	20
21	67,104	3,220	188	..	159·2	53,286	4,268	149	..	170·1	21
22	63,696	2,547	185	..	176·2	48,869	3,377	142	..	182·4	22
23	60,964	2,012	202	..	193·1	45,350	2,771	149	..	189·0	23
24	58,750	1,586	217	..	210·3	42,430	2,359	157	..	192·4	24
25	56,947	1,310	228	..	225·3	39,914	2,200	160	..	195·3	25
26	55,409	1,219	222	..	238·7	37,554	2,107	150	..	197·5	26
27	53,968	1,187	200	..	248·9	35,297	2,015	131	..	198·9	27
28	52,581	1,209	179	..	257·6	33,151	1,886	113	..	200·2	28
29	51,193	1,198	154	..	264·0	31,152	1,716	94	..	201·3	29
30	49,841	1,166	139	..	271·6	29,342	1,514	82	..	202·3	30
31	48,536	1,092	127	..	278·9	27,746	1,335	72	..	203·4	31
32	47,317	993	128	..	285·8	26,339	1,175	71	..	204·2	32
33	46,196	878	129	..	291·9	25,093	1,044	70	..	205·0	33
34	45,189	746	135	..	296·7	23,979	925	72	..	206·0	34
35	44,308	665	146	44	301·2	22,982	818	76	23	207·0	35
36	43,453	587	165	43	305·5	22,065	730	84	22	208·0	36
37	42,658	512	179	42	309·8	21,229	650	89	21	208·9	37
38	41,925	440	189	42	314·0	20,469	585	92	21	209·8	38
39	41,254	392	194	41	318·2	19,771	523	93	20	210·6	39
40	40,627	345	203	40	322·4	19,135	469	96	19	211·5	40
41	40,039	341	200	40	326·7	18,551	418	93	19	212·1	41
42	39,458	335	197	39	331·0	18,021	372	90	18	212·9	42
43	38,887	331	194	39	335·3	17,541	335	88	17	213·8	43
44	38,323	318	192	38	339·6	17,101	306	86	17	214·0	44
45	37,775	279	193	49	344·0	16,692	277	85	22	214·6	45
46	37,254	238	198	75	349·0	16,308	254	86	33	215·1	46
47	36,743	183	202	110	354·0	15,935	233	88	48	215·7	47
48	36,248	127	217	127	359·0	15,566	212	93	54	215·9	48
49	35,777	107	233	140	364·0	15,207	198	99	59	216·0	49
50	35,297	106	251	141	369·5	14,851	180	105	59	216·0	50
51	34,799	104	278	139	375·4	14,507	167	116	58	216·0	51
52	34,278	103	308	137	381·5	14,166	156	127	57	216·0	52
53	33,730	101	337	136	387·7	13,826	147	138	55	216·0	53
54	33,156	100	365	146	393·9	13,486	142	148	60	216·0	54
55	32,545	98	380	260	400·1	13,136	133	153	105	216·0	55
56	31,807	95	391	446	406·3	12,745	126	157	179	216·0	56
57	30,875	93	395	741	412·2	12,283	116	157	295	216·0	57
58	29,646	89	385	1,779	417·8	11,715	95	152	703	216·0	58
59	27,393	63	356	2,717	423·3	10,765	66	140	1,068	216·0	59
60	24,257	..	328	3,299	427·1	9,491	..	128	1,291	216·0	60
61	20,630	..	301	3,590	429·6	8,072	..	118	1,404	216·0	61
62	16,739	..	289	3,515	430·8	6,550	..	113	1,376	216·0	62
63	12,935	..	246	3,208	431·8	5,061	..	96	1,255	216·0	63
64	9,481	..	189	2,780	432·0	3,710	..	74	1,088	216·0	64
65	6,512	..	..	6,512	432·0	2,548	..	..	2,548	216·0	65

TABLE X.

CONSOLIDATED REVENUE ACCOUNT OF THE GOVERNMENT RAILWAYS SUPERANNUATION FUND FROM THE 1ST APRIL, 1912, TO THE 31ST MARCH, 1919.

Income.

	£ s. d.
Funds at the 1st April, 1912	233,457 8 6
Members' contributions	534,794 13 0
Government contributions	200,000 0 0
Interest	102,245 14 2
Fines	2,854 5 6
From New Zealand Railway Transvaal War Relief Fund	316 16 0
Miscellaneous	66 0 0
	£1,073,734 17 2

Outgo.

	£ s. d.
Pensions to members	519,645 15 7
Pensions to widows and children	56,650 5 1
Contributions returned, together with compensation paid at death or withdrawal	130,623 11 4
Transfers to other funds	907 15 5
Public Trust Office commission	1,809 11 5
Travelling-expenses	253 4 0
Fines refunded	40 10 0
Funds at the 31st March, 1919	363,804 4 4
	1,073,734 17 2

TABLE XI.

SUMMARY OF VALUATION RESULTS.

VALUATION BALANCE-SHEET AS AT 31ST MARCH, 1919.

Liabilities.

	£
Value of 1,001 pensions for £89,314 11s. 6d. per annum already granted	756,663
„ 377 pensions for £6,786 per annum granted to widows	76,815
„ 514 pensions for £6,682 per annum granted to children	34,340
„ prospective pensions for back service	2,313,070
„ „ for future service	1,918,119
„ „ to widows	136,192
„ „ to children	53,232
„ return of contributions on death	23,457
„ „ on withdrawal	270,618
	£5,582,506

Assets.

	£
Accumulated funds	363,804
Value of contributions receivable	1,259,247
„ total future subsidies to be provided	3,959,455
	£5,582,506

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