

1909.
NEW ZEALAND.

ACTUARY'S REPORT

ON THE VALUATION OF

THE GOVERNMENT INSURANCE DEPARTMENT

As at 31st December, 1908.

Presented to both Houses of the General Assembly pursuant to Section 40 of "The Government Life Insurance Act, 1908."

Wellington, 8th March, 1909.

In accordance with instructions received I have made a valuation, as at the 31st December last, of the actuarial liabilities of the Department, with the object of ascertaining the net surplus available for division amongst the policyholders, and in compliance with section 40 of "The Government Life Insurance Act, 1908," I have now the honour to report the results of the investigation.

The progress of the Department during the triennium, when compared with the previous triennium, in respect of new business and total business in force, is as follows:—

| Triennium. | New Business of Triennium. | | | In Force at End of Triennium. | | | |
|--------------|----------------------------|---------------|------------------|-------------------------------|---------------|-----------------------|------------------|
| | Number of Policies. | Sums assured. | Annual Premiums. | Number of Policies. | Sums assured. | Reversionary Bonuses. | Annual Premiums. |
| 1902-1905 .. | 9,526 | £ 2,112,927 | £ 70,428 | 45,137 | £ 10,468,316 | £ 954,751 | £ 319,221 |
| 1905-1908 .. | 9,739 | 2,261,767 | 72,803 | 47,033 | 10,955,749 | 1,068,950 | 331,830 |

From this it will be seen that there has been a satisfactory increase all round—in number of policies, sums assured, reversionary bonuses, and annual premiums.

The Consolidated Revenue Account, given below, shows the total income and expenditure for the past three years, and also the growth of the funds of the Department during the triennium; for purposes of comparison the Consolidated Revenue Account for the preceding triennium is also given.

CONSOLIDATED REVENUE ACCOUNT.

| Triennium ending 31st December, 1908. | | Previous Triennium. | Triennium ending 31st December, 1908. | | Previous Triennium. |
|---------------------------------------|------------|---------------------|---|------------|---------------------|
| | £ | £ | | £ | £ |
| Funds at beginning of triennium | 3,822,577 | 3,382,817 | Death claims | 392,458 | 379,214 |
| Renewal premiums .. | 905,698 | 855,085 | Matured claims | 273,988 | 239,495 |
| New premiums | 70,786 | 70,522 | Annuities paid | 43,440 | 38,293 |
| Consideration for annuities | 38,705 | 29,686 | Surrenders (including Civil Service policies) | 176,659 | 124,820 |
| Interest | 552,999 | 479,702 | Bonuses surrendered for cash | 16,668 | 17,442 |
| Fees | 36 | 25 | Commission | 52,307 | 50,084 |
| | | | Taxes | 33,677 | 29,269 |
| | | | Expenses | 116,919 | 109,690 |
| | | | Investment reserves .. | 20,000 | 6,953 |
| | | | Funds at end of triennium .. | 4,264,685 | 3,822,577 |
| Total | £5,390,801 | £4,817,837 | Total | £5,390,801 | £4,817,837 |

In commenting on the foregoing comparative statement of income and expenditure, it may be noted in the first place that the funds have been increased by £442,108 during the period under review.

Income.—The chief item of importance, besides a substantial increase in the premium income and purchase-money for life annuities, is the revenue from interest, which exceeded by £73,297 the interest-earnings of the previous three years. The average rate of interest realised each year for the past six years has been as follows :—

| | £ | s. | d. | | £ | s. | d. |
|--------------|---|----|----|--------------|---|----|----|
| 1903 | 4 | 8 | 5 | 1906 | 4 | 9 | 10 |
| 1904 | 4 | 8 | 2 | 1907 | 4 | 10 | 3 |
| 1905 | 4 | 10 | 4 | 1908 | 4 | 12 | 2 |

These figures are obtained by finding the rate yielded each year on the mean of the funds at the beginning and end of the year, and they show that the rate of interest earned on the Department's investments has been more than maintained.

Outgo.—The claims have increased in a normal manner, taking into account the growth of the business and the increase in ages of policyholders and duration of policies. The rate of mortality experienced has indeed been extremely favourable, and the surplus has received an unusually large accretion from this source.

The surrenders were abnormally increased in consequence of a large number of civil servants relinquishing their policies last year upon joining the new Public Service Superannuation Fund. On the other hand there is a decrease in the surrender of reversionary bonuses for cash, even when the Civil Service policies are taken into account. Indeed, one good effect of the new method of allotting bonuses has been to diminish the surrendering of reversionary bonuses, as the cash bonuses, which amounted to £28,915 in the 1900–2 triennium, decreased to £17,442 in 1903–5, and again to £16,668 in 1906–8, notwithstanding the fact that the total reversionary bonuses liable to be operated on were rapidly increasing throughout.

The amount paid in commission during the triennium has slightly increased, in keeping with the larger amount of both new and renewal business ; while, as regards the expenditure on commission and management combined, the business is now conducted at a lower rate of expense than formerly, as the following table will show :—

RATIO OF COMMISSION AND EXPENSES (excluding Taxation).

| Year. | To Total Income. | To Premium Income. |
|--------------|------------------|--------------------|
| 1890 | 14·4 per cent. | 20·2 per cent. |
| 1893 | 13·4 " | 19·0 " |
| 1896 | 12·0 " | 17·5 " |
| 1899 | 11·9 " | 17·5 " |
| 1902 | 11·3 " | 16·8 " |
| 1905 | 11·0 " | 16·7 " |
| 1908 | 10·6 " | 16·6 " |

From this it will be seen that the expense-ratios have consistently diminished since the introduction of triennial valuations, and that they are now materially lower than they were eighteen years ago.

The taxation, not included in the above, has now increased to 3½ per cent. of the premium income of the Department.

THE VALUATION.

The business to be valued consisted of 47,033 policies, assuring £12,024,699 inclusive of bonus additions, and £20,679 immediate and deferred annuities per annum, the ordinary annual premiums thereon amounting to £329,209. The Department also receives £2,621 per annum, representing additions to the tabular premiums imposed when assurances are effected on lives which are estimated to fall below the requisite standard for any reason. These extra premiums are held to cover the current year's extra risk, and are not brought into the valuation as an asset.

Basis of Valuation.—The valuation has been made on the same basis as before (H^m mortality and 3½ per cent. interest) on a strict net premium basis, whereby the *whole* margin of loading has been reserved as a provision for future expenses and profits.

The annuities were valued by the English Government Annuitants' Experience (1883) using 3½ per cent. interest for the older annuities, granted prior to June, 1896, and 3 per cent. for those granted subsequently. The bulk of the immediate annuities, therefore—viz., £10,218 per annum out of a total of £15,406 per annum—has been valued on the more exacting basis of 3 per cent.

The results of the valuation on the foregoing basis show that—

| | | |
|--|-----|-----------|
| The value of the total liability under the several contracts is .. | £ | 7,105,661 |
| Deduct the value of the future net premiums | ... | 3,090,172 |
| Leaving an immediate NET LIABILITY of | ... | 4,015,489 |
| The ACCUMULATED FUNDS (after making further provision of £20,000 towards the Investment Reserve Fund) are | ... | 4,264,685 |
| Difference, being excess of assets over liability, or GROSS SURPLUS at 31st December, 1908 | ... | £249,196 |

DISPOSAL OF SURPLUS.

The above surplus of £249,196 includes £16,887 brought forward from the previous valuation, but does not include the interim bonuses paid during the triennium, amounting to £13,138. The sum of £16,887 carried forward three years ago has accumulated at interest to £19,292, and I recommend that this be again carried forward, together with a further sum of £37,474. By adopting this course the rate of interest assumed in the valuation will be virtually reduced to £3 7s. per cent., and there will be a reasonable prospect of being able, at the close of the current triennium, to give full effect to the advice of Messrs. Ralph P. Hardy and George King, given to the Department in 1903, that "steps should be taken gradually to bring down the valuation-rate from 3½ per cent. to 3¼ per cent. in the not very distant future."

This leaves a *net surplus* of £192,430 to be divided amongst the participating policyholders, and I recommend that it be allotted in the form of a uniform reversionary bonus per cent. on the sum assured and existing bonuses, for each premium paid since the previous valuation, distinguishing between General and Temperance policyholders in regard to profit from favourable mortality in the manner provided for by the Act. I estimate that £86,786 of the divisible surplus arose from favourable mortality in the General Section of policyholders, and £13,770 from favourable mortality in the Temperance Section, while the remaining £91,874 was profit from other sources, more particularly from interest earned on investments in excess of the rate assumed in the valuation. The results are shown in the following summary:—

| APPORTIONMENT OF DIVISIBLE SURPLUS OF £192,430. | | | | | | | |
|---|---|----------|---------|----------|---|---------------------|--|
| Derivation of Profit. | | | | Total. | Resulting Rate of Uniform Compound Bonus. | | |
| | | | | | General Section. | Temperance Section. | |
| Favourable mortality | £ | 86,786 | 13,770 | 100,556 | 10/4 per cent. | 12/4 per cent. | |
| Other sources | | 81,060 | 10,814 | 91,874 | 9/8 " | 9/8 " | |
| Total | | £167,846 | £24,584 | £192,430 | 20/ per cent. | 22/ per cent. | |

The result is that policies in the General and Temperance Sections respectively will on this occasion receive compound bonuses of 20s. per cent. and 22s. per cent. upon the sum assured and existing bonuses for each year's premium paid since the last valuation, the total reversionary bonus so allotted amounting to £316,742. The following comparison of this bonus-allotment with previous ones on the same plan will be of interest:—

| | | | 1902. | | 1905. | | 1908. | |
|-------------------------|--|--|---------------|---------------------|---------------|---------------------|---------------|---------------------|
| | | | £ | | £ | | £ | |
| Divisible surplus | | | 167,933 | | 178,994 | | 192,430 | |
| Interim bonuses | | | 9,300 | | 10,873 | | 13,138 | |
| Carried forward | | | 476 | | 16,887 | | 56,766 | |
| Total Surplus | | | £177,709 | | £206,754 | | £262,334 | |
| Section. | | | Cash divided. | Reversionary Bonus. | Cash divided. | Reversionary Bonus. | Cash divided. | Reversionary Bonus. |
| | | | £ | £ | £ | £ | £ | £ |
| General | | | 149,237 | 256,949 | 159,540 | 269,850 | 167,846 | 276,876 |
| Temperance | | | 18,696 | 33,125 | 19,454 | 33,060 | 24,584 | 39,866 |
| Total | | | £167,933 | £290,074 | £178,994 | £302,910 | £192,430 | £316,742 |

The compound bonus of £1 per cent. in the General Section is equivalent to a simple bonus commencing at £1 per cent. per annum to new policies, and increasing with the duration of the policies to £1 8s. per cent. per annum in the case of the older policies; in the same way the Temperance Section bonuses range from £1 2s. to £1 11s. per cent. per annum. These bonuses are good for the premiums charged, and may be expected to increase in the future; when comparing them with those of other offices it should be borne in mind that the Department's premiums are generally speaking much lower, and its policyholders may therefore be said to receive at the outset substantial bonuses, in addition to the bare sums assured by their policies, in the shape of the larger sums assured obtainable for a given outlay.

The larger bonuses allotted to policyholders in the Temperance Section on this occasion are due to the comparatively light mortality they experienced during the triennium under review; but as this small section tends to decrease rather than to increase it will always be liable to fluctuations, a single death claim, more or less, for a large amount being sufficient to make a difference in the rate of bonus. This has sometimes been lower than, sometimes equal to, and sometimes higher than, that of the General Section, and, seeing that it cannot be expected that similar fluctuations will be avoided in the future, it would be a great saving of expense and to the advantage of policyholders in both sections if a practicable way of amalgamating them could be agreed upon.

A complete Valuation Statement, prepared in accordance with "The Government Life Insurance Act, 1908," is appended.

In conclusion, I would remark on the satisfactorily steady results of the Department's business during the past three years. Not only has the new business steadily increased, but the ratio of expenditure to income has remained practically stationary, the yield from interest has improved in a marked manner, and the mortality experience has been exceptionally favourable. As the result of these combined influences the Department is now in a position to allot increased bonuses all round, and also to make such substantial reserves as will enable it to commence another triennial period of activity with every confidence.

Respectfully submitted,

MORRIS FOX,
Actuary.

The Government Insurance Commissioner.

SUMMARY and VALUATION of the POLICIES of the NEW ZEALAND GOVERNMENT LIFE INSURANCE DEPARTMENT, as at 31st December, 1908.

| DESCRIPTION OF TRANSACTIONS. | | PARTICULARS OF POLICIES FOR VALUATION. | | | | VALUES | | | | For Assurances: Institute of Actuaries' Hm Table, 3½% interest. English Government Annuity Tables, 1881. Issued prior to June, 1896, 3½% interest; issued subsequently, 3% interest. | | | |
|---|----|--|-----------------------------------|--|---------------|---------------------------|-------------------------|----------------------------------|----------------|--|--|--|--|
| | | Number of Policies. | Sums Assured and Bonuses. | Office Yearly Premiums. | Net Premiums. | Sums Assured and Bonuses. | Office Yearly Premiums. | Net Premiums. | Net Liability. | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| ASSURANCES. | | | | | | | | | | | | | |
| I.—With Participation in Profits. | | | | | | | | | | | | | |
| Whole-life Assurances—Uniform Premiums | | | | | | | | | | | | | |
| .. | .. | 11,902 | 3,964,943 | 84,383 | 72,671 | 2,336,868 | 961,215 | 808,594 | 1,528,274 | | | | |
| .. | .. | 724 | 391,544 | 1,458 | 1,217 | 259,483 | 6,647 | 5,480 | 254,003 | | | | |
| Endowment Assurances | | | | | | | | | | | | | |
| .. | .. | 26,534 | 5,845,791 | 189,472 | 157,622 | 3,568,336 | 2,101,530 | 1,722,979 | 1,845,357 | | | | |
| " Limited, Single, and Commuted Premiums | | | | | | | | | | | | | |
| .. | .. | 176 | 52,639 | 1,132 | 905 | 27,976 | 12,490 | 9,938 | 18,038 | | | | |
| .. | .. | 6,420 | 1,036,942 | 46,645 | 39,929 | 727,601 | 629,993 | 534,118 | 193,483 | | | | |
| .. | .. | 9 | 4,848 | 229 | 185 | 2,875 | 2,599 | 2,093 | 782 | | | | |
| .. | .. | 1 | 48 | .. | .. | 16 | .. | .. | 16 | | | | |
| Annuity Assurances | | | | | | | | | | | | | |
| .. | .. | 104 | 21,310 and 5,175 per ann. at 60 | 1,111 | 1,023 | 22,118 | 15,423 | 14,236 | 7,882 | | | | |
| Reserve for extra Premiums | | | | | | | | | | | | | |
| .. | .. | .. | .. | .. | .. | 873 | .. | .. | 873 | | | | |
| Additional Reserve of Loading | | | | | | | | | | | | | |
| .. | .. | .. | .. | .. | .. | .. | .. | 3,097,438 Deduct 7,573 Add 7,573 | 3,848,708 | | | | |
| Total Assurances with Profits | | | | | | | | | | | | | |
| .. | .. | 45,870 | 11,917,165 | 324,930 | 273,552 | 6,946,146 | 3,729,897 | 3,089,865 | 3,856,281 | | | | |
| II.—Without Participation in Profits. | | | | | | | | | | | | | |
| Whole-life Assurances (transferred from Temperance to Non-profit Section) | | | | | | | | | | | | | |
| .. | .. | 5 | 1,090 | 26 | 22 | 655 | 287 | 240 | 415 | | | | |
| Endowment Assurance (transferred from Temperance to Non-profit Section) | | | | | | | | | | | | | |
| .. | .. | 1 | 212 | 6 | 5 | 112 | 81 | 67 | 45 | | | | |
| .. | .. | 3 | 60 | 1 | .. | 23 | .. | .. | 23 | | | | |
| Industrial Assurances | | | | | | | | | | | | | |
| .. | .. | 10 | 4,050 | 54 | .. | 29 | .. | .. | 29 | | | | |
| Temporary Assurances | | | | | | | | | | | | | |
| .. | .. | 19 | 5,412 | 87 | 27 | 819 | 368 | 307 | 512 | | | | |
| Total Assurances without Profits | | | | | | | | | | | | | |
| .. | .. | 45,889 | 11,922,577 | 325,017 | 273,579 | 6,946,965 | 3,730,265 | 3,090,172 | 3,856,793 | | | | |
| Total Assurances | | | | | | | | | | | | | |
| ENDOWMENTS. | | | | | | | | | | | | | |
| Simple Endowments—with return of premiums | | | | | | | | | | | | | |
| .. | .. | 597 | 77,972 | 2,954 | .. | 24,414 | .. | .. | 24,414 | | | | |
| .. | .. | 1 | 100 | 4 | .. | 25 | .. | .. | 25 | | | | |
| Endowments—Premiums cease at death of purchaser | | | | | | | | | | | | | |
| .. | .. | 187 | 24,050 | 964 | .. | 4,017 | .. | .. | 4,017 | | | | |
| Total Endowments | | | | | | | | | | | | | |
| .. | .. | 785 | 102,122 | 3,922 | .. | 28,456 | .. | .. | 28,456 | | | | |
| ANNUITIES. | | | | | | | | | | | | | |
| Immediate | | | | | | | | | | | | | |
| .. | .. | 354 | (per annum) | .. | .. | 129,493 | .. | .. | 129,493 | | | | |
| Deferred | | | | | | | | | | | | | |
| .. | .. | 5 | 98 | 69 | .. | 747 | .. | .. | 747 | | | | |
| Total Annuities | | | | | | | | | | | | | |
| .. | .. | 359 | 15,594 | 69 | .. | 130,240 | .. | .. | 130,240 | | | | |
| Total of the Results | | | | | | | | | | | | | |
| .. | .. | 47,033 | 12,024,099 and £20,679 per annum. | 329,008 and £2,621 extra premium (not valued). | 273,579 | 7,105,661 | 3,730,265 | 3,090,172 | 4,015,489 | | | | |

Approximate Cost of Paper.—Preparation, not given; printing (2,500 copies), £3 9s. 6d.

By Authority : JOHN MACKAY, Government Printer, Wellington.—1909.

Price 3d.]