

pension on retirement or other subsidiary benefits, it requires £1,289 in respect of each First Division contributor aged 40–44 and no less than £2,353 for each First Division contributor aged 60–64 to effect the same purpose. The net liability for each member in a given age group will necessarily vary somewhat from valuation to valuation, according to the incidence of average salary, length of service, &c., but the figures clearly emphasize the danger of trenching on the accumulated contributions of members of any age group for other than their own pensions.

It would be possible, though very laborious, to ascertain what might be termed the “share” of each individual member in the total Fund, and proceed to deduce by how much such amount held in the Fund on his behalf was, on the average, insufficient or over-sufficient to provide his benefits. This when applied to all members, contributors, and pensioners, would give the same results as are achieved by the more direct process of actuarial valuation of the Fund.

#### DATA.

11. The preliminary particulars required for this actuarial examination have been obtained from cards supplied by the Chief Accountant of the Railway Department—a separate card being compiled for each member who was in the service at the valuation date or who had died or withdrawn since the inception of the Fund—and these particulars form the main basis of this investigation and valuation.

#### THE VALUATION.

12. The main object of an actuarial valuation is to ascertain whether the current funds, together with the present value of the future contributions, will be sufficient to meet the future liabilities. Before the valuation can be carried out it is necessary to make a careful estimate of the various factors on which the payment of the benefits and contributions is dependent. These factors may be briefly summarized as follow :—

- (a) Rate of interest.
- (b) Mortality-rates of pensioners.
- (c) Average salary scales.
- (d) Mortality-rates of contributors.
- (e) Voluntary-withdrawal rates of contributors.
- (f) Retirement-rates of contributors.
- (g) Marriage-rates of contributors.
- (h) Probability of a member leaving children under fourteen years of age, and the average number of children.
- (i) Remarriage-rates of members' widows.

13. The rate of interest used in valuing benefits and contributions is  $4\frac{1}{2}$  per cent. throughout. As this constitutes a departure from previous valuations, I deem it desirable to point out that the change must not be interpreted as questioning the wisdom of making previous valuations at 4 per cent., since I am fully in accord with the interest basis previously adopted. Compared with the previous valuation period, however, the average annual interest rate earned has increased by more than  $\frac{1}{2}$  per cent., and moreover, judging by the investment results of the other Government Superannuation Funds, the limit of the earning-capacity of the Government Railways Superannuation Fund has not been reached. I accordingly decided that the nature and circumstances of the Fund warranted the valuation being made on a financial basis of  $4\frac{1}{2}$  per cent. This must not be construed as an assumption that the present rates—or even  $4\frac{1}{2}$  per cent.—will continue to be earned indefinitely, as it must be remembered that pension-fund membership covers a long period, in some cases over eighty years. My main justification in adopting a  $4\frac{1}{2}$  per cent. valuation basis is that the Fund is State-guaranteed and is receiving an annual subsidy, and it will be many years before any additional subsidy will be required to cover interest earnings short of  $4\frac{1}{2}$  per cent.

14. The mortality-rates adopted for pensioners were based on an investigation of the combined experience of the three Government Superannuation Funds (Public Service, Railways, and Teachers) for the period 1919–1927, and supplemented where necessary by the earlier experience of the Funds. From a careful study of the figures, combined with the results of concurrent investigations into similar funds and in the general population, it is clear that there is an improvement in vitality which has been progressive over a long period of time, and accordingly it has been deemed advisable in fixing the valuation bases to make some allowance for probable future improvements in the vitality of pensioners.

15. The next factors which entered into the calculations were the scales of average salaries in respect of the First and the Second Divisions for the year immediately following the valuation date. The salary scales constructed from the current experience of the Fund were not themselves assumed in making the valuation, but the ratios of increase from age to age were applied to the actual salary of each contributor as at the 1st April, 1927.

16. The rates of mortality, withdrawal, and retirement of contributors used in the valuation were based on an examination of the Fund's experience since the previous valuation, the First and the Second Divisions again being investigated separately. Details of the experience tables adopted and the life and service tables deduced therefrom are given in Tables VI and VII of the Appendix. The only feature calling for special comment was the great increase in the number of retirements from