

the small increase of £255,000 in the Fund is very far from keeping pace with the above-mentioned deferred liabilities in respect of the additional pensions "earned" during the period under review at the rate of seven-sixtieths of the total retiring salaries.

DATA.

16. The preliminary particulars required for this 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separate card being compiled for each member who was in the Service at the valuation date or who had died or withdrawn since the inception of the Fund—and these particulars form the main basis of this investigation and valuation.

17. It is difficult to avoid the conclusion that sooner or later some reconstruction of the Fund is inevitable, and in order to be in a position to report expeditiously on any such proposals for reconstruction, I decided to use Powers machines to punch special cards and tabulate the data in the form required for valuation. Both the Railway Department and the Post and Telegraph Department very willingly placed Powers machines at my disposal and arranged for the supervision of the work. It is unnecessary to point out that the assembly of the data by means of such machines permits rapid resorting and tabulation in any number of groupings that may be desired, thereby curtailing the time involved in investigations into the cost of making any modifications of the benefits of the Fund either for the whole Service or for either Division or for officers joining on or after any given date.

THE VALUATION.

18. 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 total 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 follows:—

- (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 such children.
- (i) Remarriage-rates of members' widows.

19. The rate of interest used in valuing benefits and contributions was $4\frac{1}{2}$ per cent., as the Fund is State-guaranteed.

20. The mortality-rates adopted for pensioners were those used in the previous valuation and 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.

21. Average salary scales in respect of the First and Second Divisions separately had to be constructed for the year immediately following the valuation date. This presented considerable difficulty as it was complicated by the salary "cuts" and the fact that there were two classes of officers, one contributing on hypothetical salaries (*i.e.*, pre-cut salaries as far back in some cases as 1921), and the other on actual salaries. To have constructed average salary scales based on the heterogeneous contributory salaries, and applied to the contributory salary of each contributor as at the 1st April, 1934, the resulting ratios of increase from age to age would have considerably overestimated the pension liabilities, as under normal circumstances the average officer contributing on actual salary would not rise to the hypothetical maximum salary, and pensions are based on salaries during the three years preceding retirement. Even if actual salaries were used to obtain the ratios of increase from age to age, the prospective salaries would have been divorced from realities in view of the fact that a large number of officers would never by normal promotions bridge the gap between their actual salaries and the hypothetical salaries on which they were contributing. The problem would have been simplified had the options to pay on higher salary been exercised, as one would have expected, only by the older officers, or by those who had been at the top of a grade so long that they took a very conservative estimate of the possibilities of future promotion. In actual fact, out of the total of 11,816 contributors, no less than 4,166 elected to pay on the pre-cut salaries and this included contributors from age twenty-four upwards, many of whom must, except under very exceptional circumstances, have recovered the amount of the salary "cuts" by promotion during the remainder of service. The tacit assumption made by each officer electing to contribute on his salary prior to the cuts was that his actual salary would not rise to the higher figure prior to retirement (normal or medically unfit), but even a brief glance at the two sets of salaries showed that at the younger