

solution ; and the value of deferred annuities can be fixed with the same accuracy as the values of immediate annuities :—

“ Value in number of years’ purchase of an annuity upon the life of a female aged fifty-five, based upon Dr. Ogle’s tables of decrements of female life, and taking interest at $2\frac{1}{2}$ per cent. 12’8863

“ Out of 596,113 women living at forty years of age, there will be 477,440 living at fifty-five years of age, and as the present value of £ 1, to be received fifteen years hence at $2\frac{1}{2}$ per cent., = ‘690,465, and the probability of a woman aged forty living fifteen years is $\frac{477,440}{596,113}$ the amount payable at forty

years of age is $12'8863 \times '690,465 \times \frac{477,440}{596,113} = 7'1262$ years’ purchase of the annuity = £ 71 5s. 3d., the amount which ought to be paid in one sum at forty years of age to secure £ 10 per annum for life after attaining fifty-five years of age. Rate of interest $2\frac{1}{2}$ per cent. If 3 per cent. interest were allowed to the Nurses on their savings, the price to be paid should be £ 61 12s. 4d. The amount a woman has to pay to the National Pension Fund is £ 82 12s. 6d. (See Table D, page 21 of Prospectus.)

“ The annual payments for fifteen years, from forty to fifty-five, at $2\frac{1}{2}$ per cent. interest, subject to failure on extinction of life, is arrived at as follows :—

“ Value of a female’s life at forty, from Dr. Ogle’s tables of decrements, and calculated at $2\frac{1}{2}$ per cent. interest 18’3284
 Deduct value of an annuity for fifteen years, subject to failure as found above... .. 7’1262
 Number of years purchase which ought to be given for an annual payment from forty to fifty-five at $2\frac{1}{2}$ per cent. interest = 11’2022
 and $\frac{71,262}{11,202} =$ £ 6 7s. 3d. annual payments at the end of each year.
 and $\frac{71,262}{12,202} =$ £ 5 16s. 10d. annual payments at the beginning of each year.

“ The annual payment to the National Pension Fund for fifteen years for a pension of £ 15 at fifty-five is 18s. 9d. per month, which payment is equal to £ 7 10s. per annum (by monthly payments) for a pension of £ 10 per annum (see Table A, page 14 of prospectus). Comment on the above figures is quite unnecessary, as the annual payments are twenty-five per cent. in excess of what they ought to be.

“ I have selected the age of forty in conse-

quence of the following paragraph in the Company’s prospectus in reference to this wonderful Table A.

“ The contributions under this table are reduced to a minimum, and therefore *they are not returnable under any circumstances.* On account of the low rate of contribution for the pension secured, this table is suitable for Nurses of forty and upwards, or for those who do not intend to change from Nursing to any other occupation, and who have not and are not likely to have others dependent upon them at the time of death. Any one may enter for a higher or lower rate of pension under this table by making known her special requirements to the Secretary.’

“ In conclusion, I will just remark that carefully prepared annuity and insurance tables, on strict mathematical principles, convince me that a great many so-called actuaries in this country are mere copyists. I shall probably at a future day have some interesting comparisons to make about insurances and annuities.

I am, Sirs, yours faithfully,
 THOMAS FATKIN.

Leeds, Dec. 11th, 1888.

“ P.S.—It must be remembered that Nurses in Hospitals are not ‘selected lives,’ and the difference between $2\frac{1}{2}$ per cent. and the rate at which the company can lend, ought to pay all expenses of loading, &c.”

“ [We give Mr. Fatkin’s figures publicity because they appear to us to be correct, at the same time adding, however, in our own behalf, that the criticisms which we have passed upon the Fund do not depend upon the adoption of any particular table of mortality, or indeed upon any assumptions which it is even possible for the actuary to the Fund to call in question. We have shown by his own representations that he reckons and expects to have a *very large surplus* to distribute eventually, and Mr. Fatkin’s elaborate figures serve to show what ground there is for this expectation. We object that a large surplus is a direct temptation to extravagant expenditure upon the mere machinery of advertising and management, and that sound policy requires that the tables should give *from the first* the full benefit that can be safely reckoned to arise with thrifty management, and that so much surplus only should be shown by the mathematical budget as is necessary to make the undertaking reasonably safe. The creation of illusory bonus by demanding needlessly heavy premiums is certainly to be deprecated, and ought to have been scrupulously avoided in connexion with this Institution. The facts on which this objection rests are not in dispute, and cannot come into dispute ; and thus it will be seen that our criticism, though parallel

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