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ACTUARIAL NOTE: VALUATION OF REVERSIONARY INTERESTS INVOLVING TWO OR MORE LIVES FOR FEDERAL TAX PURPOSES

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CECIL J. NESBITT:

It is a special pleasure for me to read a paper which has as one of its co-authors a former student who graduated from Michigan as recently as 1947 and who in the interim has attained fellowship.

The paper systematizes the calculation of reversionary interests by use of Evans's method for the important case where the 4% Actuaries' table is the basis of the calculations. I prefer this method over the Hume and Stott method presented in Spurgeon. With the tables provided in the note, calculations on the given interest and mortality bases will be greatly facilitated, as any one who has had occasion to make such calculations will recognize.

The method, as presented in the note, depends on the use of equal age joint life annuities. A mistake made recently on a student's examination paper suggests a possible rearrangement. Instead of determining the equivalent equal age w by the relation

$$(A + B c^x) + (A + B c^y) + \ldots = m\,(A + B c^w) = m\,\mu_w\,,$$

one might determine w by

$$(A + B c^x) + (A + B c^y) + \ldots = mA + B c^w = {}^{(m)}\mu_w\,,$$

where ${}^{(m)}\mu_w$ is the force of mortality in a modified Makehamized table with constant term equal to mA. The calculation of a new single age table for each value of m would be required in place of the usual equal age table. By making the calculations simultaneously with those for the original table, the work might not be too burdensome.

If such special tables were available, a modified Evans's method could be used for the calculation of contingent insurances. Corresponding to equations (1) and (2) of the note one would have

$${}^{(m)}\mu_{w+n} = \frac{{}^{(m)}\bar{A}_w}{{}^{(m)}\bar{a}_w} \qquad (1)'$$

and

$$\bar{A}^{1}_{xyz\ \ldots\ (m)} = \mu_{x+n}\,{}^{(m)}\bar{a}_w \qquad (2)'$$

where ${}^{(m)}\bar{A}_w$ and ${}^{(m)}\bar{a}_w$ would be calculated on the special table based on ${}^{(m)}\mu_x$.