

We have $k = (g - i)a_{\overline{n}|i} = (g/i - 1)(1 - v^N)$, where $v = 1/(1 + i)$.
Also by definition of i

$$k = [g(1 - t) - i(1 - t)] a'_{\overline{n}|i}, \text{ where } a'_{\overline{n}|i} \text{ is calculated at rate } i(1 - t) \\ = (g/i - 1)(1 - V^n), \text{ where } V = 1/(1 + i - ti).$$

Hence $v^N = V^n$,

$$N = n \log(1 + i - ti) / \log(1 + i) = n(1 - t)(1 + it/2 - i^2t(5 - 4t)/n \dots),$$

from which it is clear that the true period N with which to enter the tables is not much different from the period $n(1 - t)$ given by Mr Worger's rule. In his Addendum Mr Worger shows that

$$\log_e(1 + i - ti) > (1 - t) \log_e(1 + i),$$

i.e. that N is always greater than $n(1 - t)$.

It might be pointed out that Mr Worger's formula for the maximum numerical error arising from the use of his rule is not always true when k is negative and examples illustrating this are not difficult to devise. This is because Mr Worger takes his error from the formula $i + \epsilon = g - k/a_{\overline{n}|(1-t)}$, where $a_{\overline{n}|(1-t)}$ is calculated at rate i , whereas strictly speaking $i + \epsilon$ should be used. When k is positive the numerical value of Mr Worger's ϵ is greater than the true error and his formula for the limit error holds.

Yours faithfully,

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The Actuary's Training

The Editor,
*The Journal of the Institute of
Actuaries Students' Society*

11 August 1947

Sir,

The writer of the editorial review of *Surrender and Paid-up Policy Values* (*J.S.S.* Vol. VII, p. 49) doubts whether the new series of text-books will prove to be satisfactory material for the training of future actuaries.

He may well be right. I do not wish to attack him on points of detail in his argument but rather to put forward some general views which I believe to be important and worth serious consideration.

Most of the educational work of the Institute is undertaken by amateurs working, like the students themselves, in difficult conditions. No system of training yet devised, for any of the learned professions, is perfect. Our problems are shared—and shared too with the professionals of the teaching profession.

No student can achieve success without a struggle, but the joint efforts of tutor and student will be better employed if the one knows how to teach and the other how to learn. Very little is generally known at present about the art and science of learning and teaching but research is now going on in this country. Here is a field for actuaries to explore. It is a wide field, but it concerns us intimately, and particularly as members of a Students' Society we should keep in touch with developments.

Yours faithfully,

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