CORRESPONDENCE

(To the Editors of the Journal of the Institute of Actuaries)

SIRS,

May I venture to make a slight correction on the Note on p. 335 of your last issue on the paper by Herr Dr W. Thalmann in the *Mitteilungen der Vereinigung schweizerischer Versicherungs-mathematiker?*

The note runs:

"A table of the Prym (incomplete Γ) function

$$\phi\left(\xi.\Im\right) = \xi^{\Im} e^{\xi} \int_{\xi}^{\infty} t^{-(1+\Im)} e^{-t}\, dt,$$

for the calculation of single and joint life annuities by any table following Makeham's law, with closer and further ranging values for the purpose than the *Tables of the Incomplete* Γ-*Function* of Professor Pearson."

Now the Prym function is *not* the Incomplete Γ-function, which is defined to be

$$\Gamma_x\left(p + 1\right) = \int_{0}^{x} e^{-x} x^p\, dx.$$

It is clear that thus defined p can only range from -1 to $+x$, and that it is impossible to table the incomplete Γ-function between the ranges -1 and -2. By aid of the factor $\xi^{\Im} e^{\xi}$, it is possible to table Prym's function from $\xi = 0$ for values where the incomplete Γ-function becomes infinite. This Dr Thalmann has done for the range -1 to -2, inserting 40 values of ϑ between -1 and -2. He has a very complete series of values of ξ changing in argument steps as he ascends.

The *Incomplete* Γ-*function Tables* cover the ground from $p = -1$ to 50, and are given to 7 decimal figures. Dr Thalmann's table of Prym's function covers the ground from $p = -1$ to $p = -2$ and does so to four decimal places. I think possibly the words "with closer and further ranging values" are misleading, for Dr Thalmann's and my tables do not cover the same area and not only my p, but my argument goes to far higher values than his. Our tables indeed serve quite different aims, and to deduce values from my table for the area of Thalmann's could only be done by a troublesome recursion formula and much interpolation work. This apparently Dr Thalmann appears to have undertaken, for he says, "Wir fügen *gerne* bei, dass uns das Pearsonwerk gute Kontrolldienste *geleistet* hat."

In short, both tables seem to me to serve their own special purposes, and as they do not cover the same area I venture to ask you to publish this note.

I am, Sirs, etc.

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