CORRESPONDENCE.

MR. MANLY'S PAPER.

To the Editor of the Journal of the Institute of Actuaries.

SIR,—Referring to the subject discussed at the Institute on Monday last, permit me to bring to the notice of your readers the following modification of the processes advocated by Mr. Manly.

In place of Mr. Sprague's substitution of P_{x+1} for P_x, we can, where practicable, and with, perhaps, greater equity as between entrants at different ages, assess our new business expenditure by way of fixed charge (say r) per £1 assured. This will be represented in the annual loading by $\frac{r}{1+a_x}$, and at age t the amount of initial expenditure not repaid will be $r\frac{1+a_t}{1+a_x}$, or $r(1-V_{x|t})$.

Now we know that the net formula will resolve itself into

$$\mathbf{b}^1=\frac{D_t}{D_z}(1-V_{x|t});$$

and if we add, as a further endowment to be purchased, the above outstanding debt, we have

$$\mathbf{b}^1=\frac{D_t}{D_z}(1-V_{x|t})(1+r).$$

At a second valuation we shall have

$$\mathbf{b}^2+\mathbf{b}^1\frac{D_z}{D_{z'}}=\frac{D_{{}^1t}}{D_{z'}}(1-V_{x|{}^1t})(1+r)$$

in the same way, since the reserve value at any subsequent date of the endowment purchased by $\mathbf{b}^1$ is irrespective altogether of the amount or term of the endowment so purchased, and the introduction of $r(1-V_{x|{}^1t})$ represents the amount of expenditure outstanding at the new date of maturity.

The same reasoning will apply to all future valuations, and the formula is reduced to the ordinary net one by dividing out by $(1+r)$,

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i.e., that all provision can be made, and Mr. Manly's processes and tables still employed by the simple expedient of first discounting the amount of the cash bonus under treatment.

I am Sir,
Your obedient Servant,

London, E.C., H. P. CALDERON.
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