

As the American Offices (with very few exceptions) employ the Carlisle, or Old Experience, at 4 or $4\frac{1}{2}$ percent, their premiums should be higher than the above, and a comparison will confirm Mr. Younger's conclusion with reference to them.

The restriction as to the non-discontinuance of payments till after two years seems merely intended to allow the effect of selection to recoup the Offices for loss on the first payment by commission and preliminary expenses, and need hardly be considered.

There can be no doubt that this form of assurance is becoming a favourite on this continent, its great recommendation being probably its definiteness as regards the surrender values.

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ON THE EQUITABLE APPORTIONMENT OF A FUND BETWEEN THE LIFE TENANT AND THE REVERSIONER.

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

SIR,—the words “rough justice” quoted by Mr. Baden at page 284 from my remark at page 280, were used by me with reference, not to the “rateable division” of the fund, but to the division which Mr. Baden advocates. Considerations dissimilar from those which he advanced had led me to feel a decided preference for the latter method, without however my being able to satisfy myself that its applicability could be fully demonstrated.

I cannot regard it as surprising that, in treating upon this subject, so many persons consider the market values of the separate interests to be the point from which to start; but it remains in the next place to be decided upon what principle the life tenant and the reversioner shall share that dormant value or surplus which is only to be realised upon the completion of an arrangement between them for cancelling the existing tenure. An apportionment in the proportion of the market values of the two interests is the only method which I have known to be proposed for dividing such surplus; but I venture to submit that there are two other methods which are just as plausible. It might be alleged that as the consents of the two parties are equally necessary to the contemplated arrangement, the surplus realised by it should be divided equally between them. Or it might, I think, be argued that in addition to the market value of his interest, each party should be credited with the difference between the market value of the interest of the other party and the value of it when computed as a part of the perpetuity; for this is the difference of which each deprives the other until both consent to effect the arrangement.

In illustration of these several methods of dividing the surplus, I subjoin three examples in which the age of the life-tenant is assumed to be respectively 20, 45, and 70; and in each case the net income chosen is £30, assumed to be of the capital value of £850. For estimating the market values, the formulas selected from those illustrated by Mr. Porter are as regards the reversions A 6 per cent Carlisle, and as regards the life-

tenancies $\frac{1}{1-v_5+P} - 1$, deducing P from the annual premiums of £1. 14s. 7d., £3. 11s. 4d., and £11. 7s. 0d., respectively, these being approximately the charges made by Companies for non-participating policies of £100 to lives aged 20, 45, and 70 on their last birthdays.

	EXAMPLE I. LIFE TENANT AGED 20.		EXAMPLE II. LIFE TENANT AGED 45.		EXAMPLE III. LIFE TENANT AGED 70.	
	Life Tenant.	Rever- sioner.	Life Tenant.	Rever- sioner.	Life Tenant.	Rever- sioner.
(A.) Values of the two interests as parts of a perpetuity in possession; being approximately $3\frac{1}{2}$ per cent (Carlisle)	£ 597	£ 253	£ 448	£ 402	£ 207	£ 643
(B.) Market Values of the separate interests	432	136	330	252	156	513
(C.) Balance; or defects in Market Values	165	117	118	150	51	130
(D.) Total dormant value or surplus	282		268		181	
(E.) "Market Values," with the addition to each of a corresponding proportion of the total surplus	646	204	482	368	198	652
(F.) "Market Values," with the addition to each of half of the total surplus	573	277	464	386	246	604
(G.) "Market Values," with the addition to each of the above-mentioned defect (C) in the market value of the other . . .	549	301	480	370	286	564

The incongruity which the results E, F, G, exhibit,—not merely in the difference of their magnitudes in any one example, but more especially in the different order of their magnitudes in the three examples,—is discouraging to the adoption of the market values as a basis of calculation; for I am at a loss to conclude which of these three methods of dividing the surplus is the most plausible. In default of such a conclusion, the disadvantages inflicted upon each party by the other during every year of the joint continuance of the two interests may, I think, be roughly, but not unreasonably, treated as equivalents in the sense of setting them off against each other. If so, the deductions made in computing the market values are to be disregarded on both sides, and there remain only the original values (A) which are indicated for the respective terms by the rate of interest realised upon the fund and by the selected mortality table, and which are advocated by Mr. Baden.

It is observable, too, that any deviation from such a division of the fund causes the assignment to either one party or the other, in respect of

his existing interest, of a larger sum than would be assigned as the value of the corresponding term when calculated as part of a freehold or perpetuity in possession. Any such deviation may therefore be regarded with suspicion in the assumed case of neither party wishing to take advantage of the other.

I am, Sir,

Your very obedient servant,

8, *Mostyn Terrace, North Brixton,*
12th August, 1871.

EDWARD SMYTH.
