

CORRESPONDENCE.

ON THE RULES FOR FINDING THE SPECIFIC SUMS INSURED ON THE DIVISIONS OF RISK UNDER FIRE INSURANCE POLICIES.

To the Editor of the Assurance Magazine.

SIR,—The question brought to notice by your correspondent “R. B. F.” furnishes a good opportunity of showing with what ease specific and average policies may be made to combine to pay *rateable* proportions of loss on property jointly insured by them. Referring, for discussion of the principles of apportionment, to the papers in the *Assurance Magazine*, vol. vi., page 282,¹ and vol. viii., page 140,² I shall here merely state, in algebraic symbols, the rules for finding the *specific sums insured* on the divisions of risk, as it is in proportion to them that the loss should be divided.

Let V = the value of the property covered by any policy,
 S = the sum insured, and
 L = $l + l' + l'' + \&c.$ —that is to say, the total loss equal to the sum of the partial or divisional losses; then

$\frac{S}{V} \times l + \frac{S}{V} \times l' + \frac{S}{V} \times l'' + \&c.$, are the divisional *specific sums insured* by the *average* policies on the property destroyed, their total amount being $\frac{S}{V} \times L$; and

$\frac{S}{L} \times l + \frac{S}{L} \times l' + \frac{S}{L} \times l'' + \&c.$, are the divisional *specific sums insured* by the *specific* policies, their total amount being equal to S.

The aggregate amounts in the case under consideration being—

		Sums insured.				
<i>Specific</i> —	By A,	Rd. 40,000	on merchandise, including sugars, in A to L.			
”	” C,	38,000	” ” ”	”	”	
”	” D,	85,000	” ” ”	”	in A to K.	
”	” D,	10,000	” ” ”	”	in L.	
<i>Pro rata</i> —	” B,	30,000	” ” ”	”	in A to L.	
”	” E,	30,000	on sugars	”	in A to L.	
				Values.	Loss.	
				Sugars, in A to K or A to L .	Rd. 138,358	Rd. 84,719 (1)
				Other merchandise, in A to K .	88,743	49,953 (2)
					227,101	134,672
				Ditto, in L only	6,827	6,827 (3)
					233,928	141,499

then the form $\frac{S}{L} \times l, \&c.$, gives the divisional *specific sums insured* by the *specific* policies; thus—

By A, $\frac{40,000}{141,499} \times 84,719 = 23,949 =$ specific sum applicable to bear loss on (1)
 ” $\times 49,953 = 14,121 =$ ” ” on (2)
 ” $\times 6,827 = 1,930 =$ ” ” on (3)
 By C, 22,752 on (1); 13,415 on (2); 1,833 on (3);

¹ “A Problem in Fire Insurance: ‘To apportion a given Loss on Property insured by Specific Policies.’”

² “A Chapter in Fire Insurance: ‘Specific’ and ‘Average.’”

the calculation being the same as last, substituting 38,000 for 40,000 as the amount insured.

By D, $\frac{85,000}{134,672} \times 84,719 = 53,472 =$ specific sum applicable to bear loss on (1)
 " $\times 49,953 = 31,528 =$ " " on (2)
 And by distinct item, 10,000 . " " on (3)

The form $\frac{S}{V} \times l$, &c., gives the following divisional *specific* sums insured by the *average* policies, viz. :—

By B, $\frac{30,000}{233,928} \times 84,719 = 10,865$. . . on (1)
 " $\times 49,953 = 6,406$. . . on (2)
 " $\times 6,827 = 875$. . . on (3)
 By E, $\frac{30,000}{138,358} \times 84,719 = 18,370$. . . on (1)

Combining these figures in a tabular form, and dividing the loss in proportion to the several sums, we arrive, without further trouble, at an adjustment of the claim which in every respect fulfils the conditions of the insurances, viz. :—

	PROPORTIONAL AMOUNTS INSURED SPECIFICALLY BY					
	A.	B.	C.	D.	E.	Totals.
Sugars in A to K	23,949	10,865	22,752	53,472	18,370	129,408
Other merchandise in ditto	14,121	6,406	13,415	31,528	..	65,470
Merchandise in L	1,930	875	1,833	10,000	.	14,638
Rd.	40,000	18,146	38,000	95,000	18,370	209,516

	RATEABLE PROPORTIONS OF LOSS.					
	A.	B.	C.	D.	E.	Totals.
Sugars in A to K	15,679	7,113	14,895	35,006	12,026	84,719
Other merchandise in ditto	10,774	4,888	10,235	24,056	..	49,953
Merchandise in L	900	408	855	4,664	.	6,827
Rd.	27,353	12,409	25,985	63,726	12,026	141,499

If a person insured goods worth £1,000 for £500, then, by the *pro rata* condition, he would himself be held as an insurer of £500, and bear his share of a loss in like proportion. The meaning intended to be given to that condition, therefore, seems to be that the property destroyed shall be considered as insured for its full value—the deficiency in the amount insured by the Offices being insured by the assured himself; and the evident object of the condition is the same as that of the average clause, viz., to fix the amount which the Office shall insure on the property destroyed, which amount will only be $\frac{S}{V}$ of the loss. By the preceding table it will be seen that, in consequence of specific policies having to bring the *whole*

sums insured to bear upon each loss, there is actually a greater amount insured than is required to satisfy the *pro ratâ* condition; so that the policies effected with that condition sustain a smaller proportion of loss than they would have done had the assured either been his own assurer for the excess of sums beyond the amounts insured by them or insured it in another Office. The assured should not, therefore, bear any share of the loss himself, as his obligation to the *pro ratâ* policies has been satisfied by the substitution of the specific policies.

I am, Sir,
Your obedient Servant,

London, 18th April, 1859.

THOMAS MILLER.

REPLY TO PROFESSOR DE MORGAN'S REMARKS AS TO THE
AUTHORSHIP OF GRAUNT'S OBSERVATIONS.

To the Editor of the Assurance Magazine.

DEAR SIR,—I have read, with all the attention due to the authority of so eminent a writer, Professor De Morgan's letter, published in your last Number,¹ criticising the assertion quoted by me, that the *Observations on the Bills of Mortality*, published in the name of Capt. John Graunt, were actually written by Sir William Petty.

The question of the authorship of the earliest work upon vital statistics can hardly fail to be considered an important one by persons interested in the science, among whom will, no doubt, be found the great majority of your readers; and I trust I may, therefore, be permitted to intrude upon your space for the purpose of stating why the facts and arguments adduced by the learned Professor appear to me less conclusive than he evidently considers them.

Before going into the discussion, however, I must point out that, whatever may be thought of the assertion in question, your correspondent is certainly in error when he attributes the revival of it to me—thereby implying that it had been previously an obsolete and exploded opinion.

So far is this from being the case, that I have generally found a similar view to my own entertained by the few persons I have met with who have paid attention to the subject; and this view has been promulgated in more than one popular work of recent date.

Of all the books published during the present century, relating to the time when Graunt and Petty lived, the one most extensively read has been, undoubtedly, Macaulay's *History of England*; and, next to that, may probably be placed the *Diary of Samuel Pepys*. Now, both the author of the first and the editor of the second of these concur in ascribing the work under consideration to Petty.²

Let us examine the facts brought forward in support of a contrary opinion. It is stated, 1stly, that the work was published in the name of Graunt; 2ndly, that he derived great reputation from it, and was, in consequence, elected a Fellow of the Royal Society; 3rdly, that Sir William

¹ *Assurance Mag.* viii. 166.

² See Macaulay, 1st edition; Lond., 1849, i. 282, Note. Pepys, 4th edition, Lond., 1858, i. 266, Note.