

## CORRESPONDENCE.

## ON THE AVERAGE DURATION OF HUMAN LIFE, AS APPEARING FROM THE CENSUS TABLES AND THE REGISTRAR-GENERAL'S RETURNS OF BIRTHS AND DEATHS.

*To the Editor of the Assurance Magazine.*

SIR,—I beg leave to communicate a little calculation, which may not be without interest, on the average duration of human life, as appearing from the Census Tables and the Registrar-General's Returns of Births and Deaths.

The problem solved is, assuming that all lives are of equal duration, what must that duration be in order that the births, deaths, and increase of population may remain unchanged? If  $r$  be the rate of increase from births and deaths only,  $t$  the length of the period,  $b$  and  $d$  the ratios of births and deaths; then  $r = b - d$ , and the average duration of life is given by the formulæ  $\frac{rt}{d} \div \text{hyp. log. } (1 + r)$ .

Now the population of England and Wales,		
<i>Enumerated</i> 31 March, 1851, was	. . .	18,054,170
<i>Estimated</i> for same date, 1841	. . .	15,997,450
		2,056,720
Actual increase in the ten years	. . .	2,056,720
The Registrar-General's Returns give for the		
BIRTHS in the same period	. . .	5,511,653
DEATHS in the same period	. . .	3,781,256
		1,730,397
Excess of births over deaths for the ten years		1,730,397
<i>Difference</i> arising from excess of immigration		326,323

This difference is the only element of uncertainty in the calculation. The plan which I have used has been to subtract a portion of this difference from the returned deaths, for the *corrected deaths*, and to make  $r$  the ratio which the difference between the returned births and corrected deaths bears to the population in 1841.

It will not be necessary to trouble you with the actual detail of computation. Using as corrections, severally,  $\frac{1}{4}$ th,  $\frac{1}{6}$ th, and  $\frac{1}{8}$ th of this difference, I obtain for the average life—

- (1) For  $\frac{1}{4}$ , 44.7442 years, or 44 years 9 months, nearly.
- (2) "  $\frac{1}{6}$ , 44.824 " 44 " 10 "
- (3) "  $\frac{1}{8}$ , 44.914 " 44 " 11 "

I am disposed to think the middle one the most likely to be right. As the corrections used are in arithmetical progression, it will be easy for anyone who prefers another correction to interpolate to it.

The above calculation would seem to indicate that the present value of infant life is greater than would appear from the Carlisle Table. This may be owing in part to vaccination, and to the improved treatment of the dis-

eases of children. There may also be some variation in the practice of returning a birth and death instead of a still-birth, though this would be more likely to tell the other way. In any case, there is matter for consideration.

I have the honour to be, Sir,  
Your obedient Servant,

13, Brompton Row,  
12th February, 1856.

CHARLES W. MERRIFIELD.

ON THE COMPARATIVE VALUE OF GOLD IN DIFFERENT COUNTRIES.

*To the Editor of the Assurance Magazine.*

SIR,—Referring to Notes and Queries, in *Assurance Magazine*, No. XXII., pp. 104, 105, on the subject of “Comparative Value of Gold in different Countries,” there is a mistake in the statement that “one kilogramme of fine gold (or 32·154 ounces) is valued, at par, at 3434·44 francs.” This was never, unless I am misinformed, the par value. The par value, according to the French Mint regulations of 6 June 1803, 1 July 1835, and 1 October 1849, has uniformly been 3444·444 francs; and the net French Mint value, after deduction allowed for cost of coinage, &c., although it was 3434·44 by the tariff of 6 June 1803 (17 *Prairial*, an xi.), ceased to be so since the tariff of 1 July 1835, and became 3437·77 francs.

I cannot understand why the metal silver is brought into the *gold* calculation of the *Magazine* statement. I submit the following for the favour of your consideration, whether they be not the true conditions of the problem rather than those given in the statement referred to:—

1. One ounce English of standard gold, of  $\frac{1}{12}$  fine, = £3·89375.
2. One kilogramme French (or 32·154 ounces English) of fine gold is, according to French Mint regulations, of the net value of 3437·77 francs.
3. At 4 per mille premium, being the current *agio* of the day, 1000 francs Mint value of gold = 1004 francs.

$$\text{Then we have } \frac{1 \times 11 \times 3437\cdot77 \times 1004}{3\cdot89375 \times 12 \times 32\cdot154 \times 1000} = \frac{37966809\cdot188}{1502395\cdot65} =$$

25·27 francs (as per the above conditions, and *not* 25·25 as per the statement before mentioned).

Shorter ways suggest themselves for a general method, applicable to any given *agio* per mille; but all dependent on the same *rationale* upon which the calculation just given in detail must always rest, so long as the currency regulations of the two countries, England and France, remain as they now are with respect to the appreciation of gold.

I remain, Sir,  
Yours always truly,

*Globe Insurance, Cornhill,*  
*London, 22 January, 1856.*

FREDERICK HENDRIKS.

NOTE.—We are much obliged to our correspondent for his correction of the statement as to the Mint price of gold in France. We were not aware