

## CORRESPONDENCE.

MR. JARDINE HENRY'S PAPER ON THE RELATION OF THE  
CARLISLE TO OTHER TABLES OF MORTALITY.

*To the Editor of the Assurance Magazine.*

DEAR SIR,—As I was unable to be present at the reading of Mr. Jardine Henry's paper before the Institute of Actuaries, I shall feel obliged if you will allow me to enclose a quotation from Dr. Price's work, and an extract from the introduction to some tables which will shortly be published.

Mr. Henry has applied the corrections for emigration, required in tables constructed on the deaths alone, to the English Life Table, which was constructed in the manner characterized by Dr. Price as admitting of no errors from such sources.

The correction for misstatements of age is not of the nature he imagines, as the enclosed extract shows.

I regret very much that Mr. Henry should have altered the expectations of life by the English Life Table. I must protest against his "corrections": they are like arbitrary alterations of the values of notes in circulation.

I have the honour to be, dear Sir,

Yours very truly,

General Register Office, Somerset House,  
April 8, 1863.

W. FARR.

*Dr. Price on two kinds of Life Tables.*

"There are two sorts of *data* for forming tables of the probabilities of the duration of human life at every age. One is furnished by registers of mortality showing the numbers dying at all ages; the other, by the proportions of deaths at all ages to the numbers living at those ages, discovered by surveys or enumerations.

"Tables formed from *the former of these data* are correct only when there is no considerable fluctuation among the inhabitants of a place, and the births and burials are equal. When there are *more removals from than to a place*, and the births exceed the burials, as is almost always the case in country parishes and villages, tables so formed give the probabilities of living too low. When the contrary happens, as is generally the case in towns, they give the probabilities of living too high. But tables formed from the latter of these *data*, are *subject to no errors*. They *must be correct, whatever the fluctuations are in a place, and how great soever the inequalities may be between the births and burials.*"—*Dr. Price's Works*, vol. ii., p. 251.

*Extract from Introduction to English Life Table, No. 3.*

"The rate of mortality at each age is thus deduced from (*a*) the deaths registered at that age, and (*b*) from the population of corresponding ages enumerated at the Censuses. Now it is generally admitted that the ages of a certain number of women are understated. And I had to consider what correction was necessary upon this ground.

"The probable extent of the error in the statement of women's ages it was shown, in the Census Report for 1851, is not considerable; but as the effect of the error is not understood by some, its consideration is necessary.

“The English Life Table is not deduced from the population or from the deaths *alone*, but from the ratio the one bears to the other at different ages; and to make the effect of transfers from one age to the other evident, assume that the following numbers represent the exact numbers living and dying at the three ages 25, 35, and 45 :—

FEMALES.			
Age ( <i>x</i> ).	Living, <i>P<sub>x</sub></i>	Dying in a Year, <i>d<sub>x</sub></i>	Annual Rate of Mortality per Cent.
25	313,095	3,024	·966
35	281,506	3,279	1·165
45	247,434	3,555	1·437

“The mortality, it will be observed, increases as age advances; so that if all the women of 35 were returned ten years younger than they are, the mortality at the age 25 would be overstated—the excess being ·01165 —·00966. But there is less chance of women of 35 at death being returned as 25 than there is of their being so returned at the Census; and the corrective effect of this excess in the proportion of women at the Census transferred to the earlier ages is apparent on inspection of the formulæ below.

*d* represents the deaths,

*P* the population,

*m* the mortality,

and  $r^{10}$  the increase of the rate of mortality between the ages 25 and 35.

$$\text{Thus, } \frac{d_{25}}{P_{25}} = m_{25}; \quad \frac{d_{35}}{P_{35}} = r^{10}m_{25}$$

$$\therefore \frac{d_{35}}{r^{10}P_{35}} = m_{25} = \frac{r^{-2}d_{35}}{r^8P_{35}} = m_{25}.$$

“It is evident that an increase in the population, and a decrease in the relative deaths transferred from 35 to 25, might reduce the error to insignificance. Upon comparing the female rates of mortality with those of males and the rates of progression in the mortality of the two sexes, I have come to the conclusion, after carefully weighing the facts, that this has actually occurred; that the rates of mortality correctly represent the mortality of the female population; and that the probabilities of female life deducible from the mortality are substantially true.

“The rates of female mortality are, at the ages 20–40, in singular accordance with those deducible from observations on males.

Age.	ANNUAL RATE OF MORTALITY PER CENT.	
	Males.	Females.
25	·920	·966
35	1·133	1·165
45	1·554	1·437
55	2·485	2·120
65	4·698	4·198