

## WILLIAM MORGAN, F.R.S., 1750-1833

WILLIAM MORGAN died on the 2nd May 1833 and in commemoration of the Centenary of his death two pages of his beautiful handwriting are reproduced to nine-tenths of the original size.

Morgan had been appointed actuary to the Society for Equitable Assurances on Lives and Survivorships on 16th February 1775. He had formerly been, for one year, assistant actuary; an appointment obtained for him by his uncle, Richard Price, who had been consulted by the society with regard to its business.

In the same month, February 1775\*, Price had, in some written "observations" explained to the society how it could see by three methods whether it was in a satisfactory condition. One of the methods was of little use and though examined for some years was subsequently disregarded by Morgan. The others were a study of the mortality experienced and a valuation; these were put into operation by Morgan. It seems from the early records and from Morgan's statements that the ideas were Price's but Morgan was at the time working for the Equitable and must have known all about his uncle's observations before they were sent in, even if he did not have a share in producing them. On some subsequent occasions it looks as if the younger man was glad to have the support of one who was not only older but had already won the confidence of the directors and members of the society. There is no doubt that the actual investigations were made by Morgan with some arithmetical help from his assistant Thomas Cooper.

The larger of the sheets reproduced is from the minutes of a general meeting of the Equitable Society held on the 5th September 1776 though probably some of the figures were shown to the directors in November 1775. The upper table on the sheet compares the mortality experienced by the society with that of three mortality tables, namely, Dodson's on which the premiums had been based, Simpson's and Halley's. The figures give, I believe,

\* Morgan in "Rise and Progress of Equitable Society" 1828 gives the year as 1776 but the old minute books seem clear that the date was 1775. Walford quotes Morgan in his *Insurance Cyclopædia*. Walford's helpful account of the Equitable cannot be accepted in all details. Either he did not have access to the records or some points escaped his vigilance.

Comparison of the Duration of Life in the Society with those in the North, 1796

Ages...	Continuance more than 40 Years		40 to 50 Years		50 to 60 Years	
	N <sup>o</sup> died	N <sup>o</sup> died	N <sup>o</sup> died	N <sup>o</sup> died	N <sup>o</sup> died	N <sup>o</sup> died
10 to 20	25	22	1	27	84	1 - 7/10
20 to 30	182	120	2	144	159	4 6.
30 to 40	760	303	5	258	1283	11 20 1/2
40 to 50	987	300	4	249	1656	13 30 3/4
50 to 60	1274	173	4	148	1057	23 32 3/8
60 to 70	257	55	2	31	463	12 20 7/8
70 to 80	55	5	-	2	62	7 5 1/2

Comparison of the Duration of life at above for 20 years from 1768 to 1796 both inclusive

Ages...	Continuance More than 40 years		40 to 50 years		50 to 60 years		Ratio by the 1000
	N <sup>o</sup> died	N <sup>o</sup> died	N <sup>o</sup> died	N <sup>o</sup> died	N <sup>o</sup> died	N <sup>o</sup> died	
10 to 20	270	469	4	350	1	176	5 2 3/8
20 to 30	2166	3691	20	3907	18	4766	60 121 3/8
30 to 40	7317	6670	98	3506	18	18920	122 305
40 to 50	9626	5048	92	4078	20	17770	230 379 3/8
50 to 60	6340	2515	75	2596	22	11651	259 327 3/8
60 to 80	2265	201	22	629	4	4191	129 246 3/8

All ages from 10 to 80 as 911 to 1289 3/8 as 2 to 2 very nearly...



the first serious estimate of the mortality of a life-office population. The lower part of the page gives the results of Morgan's first valuation.

The other sheet reproduces a single page from Morgan's notebook which he made up year by year of the business of the society and shows how he watched the mortality. The record goes back to 1768, but 1768 to 1775 are grouped together and not shown in individual years. The comparisons were made with the mortality table on which the premiums were based. The early comparisons were, therefore, with Dodson's table and, after the premiums had been reduced and amended according to the Northampton table, that table alone was used. The premiums for existing assurances were reduced to the Northampton scale. This particular page was chosen as being likely to lend itself to photographic reproduction.

The proportions in the final column show a tendency to approach unity at those ages where there is little new business\*. Morgan noticed this and concluded that the Northampton table represented the mortality when there was no "selection." This inference overlooked that part of the difference was due to an overstatement of the mortality at the earlier ages by the Northampton table but the idea of ascribing to "selection" the difference between a population mortality and the mortality of a life office was a fine effort in statistical inference.

W.P.E.

\* N.B. The reproductions have been made for and given to the Institute by the Equitable Life Assurance Society, to which the thanks of the members are gladly accorded. Joint Editors.