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*On an Investigation into the
Mortality of the Married Females
of the Peerage*

BY

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On an Investigation into the Mortality of the Married Females of the Peerage.

(Read before the Actuarial Society of Edinburgh, 6th December 1894.)

IN July 1880 there appeared in the *Journal of the Institute of Actuaries* certain "Remarks as to the Influence of Marriage on the Death-Rates of Males and Females, abridged from Dr. James Stark's Letters to the Registrar-General of Births, Deaths, and Marriages in Scotland" (*J.I.A.* xxii. 233). In these letters Dr. Stark compares the mortality of the married and unmarried females at different ages in Scotland in the years 1861 and 1862; and calls attention to the fact, that the excessive mortality of the former, as compared with that of the latter class of lives, appears to be confined to the ages under thirty years. He offers, as an explanation of this, the great danger—well known, as he says, to every medical practitioner—which attends the delivery of the first child; and then proceeds to demonstrate its effect by means of two tables, showing (1) "the number and ages of mothers and the number of children which they had on the birth of their last child," and (2) the "proportion of mothers bearing their first child to every 100 mothers." The figures given in the former table show that nearly as many women above thirty years as under that age bear children; and yet the marked difference between the mortality of the married and unmarried is only apparent below that age. From inspection of the second table, which shows the number of mothers bearing their first child to be, after age thirty, very small as compared with those under that age, he concludes that not only is the view that the risk to the mother is far greater at her first confinement, than at any subsequent delivery, rendered almost a certainty, but that the increased mortality of the married females is almost solely due to this cause.

An analysis of the practice of Life Offices with regard to female lives will be found in the *Journal* of the Institute, volume xxix. p. 75; and, from a perusal of this, it will be seen how differently they deal with this extra risk. A few provide for it directly by charging 20s. per cent. on marriage, or 10s. on first confinement, or a single premium varying according to the duration of marriage;

others by charging 5s. per cent. per annum, either throughout the duration of the policy or ceasing at age fifty ; while many charge no extra at all.

At the suggestion of Dr. Sprague, I have investigated the mortality of the married ladies of the peerage, in the hope that such an investigation may not only shed further light on this important question, but prove useful in other ways. I have to thank Dr. Sprague for not only suggesting the principal lines on which such an investigation should be carried out, but also for giving me the benefit of his advice on various points that arose from time to time.

Of the various works which contain particulars of titled families, in only one, namely Lodge's *Peerage*, are to be found the dates of birth of the ladies of that class. This was, therefore, the principal source from which the data were extracted ; but I had, in many cases, to refer to other works for dates that were not given in "Lodge."

As an Insurance office is sometimes asked to accept as evidence of age the particulars given in the *Peerage*, it may be useful to mention one or two points, which show that too great reliance must not be placed on the correctness of the dates found there. In several instances, in course of comparison of the dates of birth and marriage to obtain the age at marriage, the inaccuracy of one or the other was evinced by the abnormally low age at which the lady was apparently married. For example, in one case the life was stated to have been born in May 1843, and married in March 1857—that is, when she was only in her fourteenth year. As I learned from the editor of Lodge's *Peerage*, that he depends entirely on the information supplied by the families themselves, and has no other source of information beyond this, I wrote, in the case referred to, to the present holder of the title ; and he informed me that the correct date of birth should be 25th August 1837, making the lady nineteen years of age at marriage. Again, in some instances, an obvious misprint was easily detected at the same stage of the inquiry. For example, a lady was stated in one edition to be born in the year 1800, and married in 1814 ; but, on investigating other editions, I found that the latter date was a misprint for 1841, the age at marriage thus being forty-one instead of fourteen. Again, a person would be said to be born in the year 1748, where it would be obvious from the dates of birth of the other members of the family that the correct year must be 1784. These are examples of the sort of errors that are brought to light by a careful examination of the work.

In dealing with the very numerous cases where the date of birth was wanting, it may be useful to mention that it was generally possible, by an inspection of the adjacent dates of birth, to obtain a close approximation to the true date. For example, suppose a

member of a family is stated to have been born on 20th October 1784, and his next younger brother on 19th January 1788, then the year of birth of a sister, who came between the two, and whose date of birth was not given, may fairly be taken as 1786 without involving much error. The date of marriage, too, was often not given in "Lodge": in such cases Foster's *Peerage* proved very useful. The compilers of the latter work have not apparently been content with inquiring only of the families themselves on this point, but have obtained elsewhere the required dates, when not forthcoming from the usual source.

The next point to be considered was as to the extent of the data to be employed. Taking the edition of the *Peerage* for 1887, I wrote cards for all the married ladies who were of the following relationships to the then holder of the title, viz.: (1) his daughters, (2) his sons' daughters, (3) his sisters, (4) his brothers' daughters, (5) his father's sisters, (6) his father's father's sisters. Wives were not included unless they appeared again under their maiden family name. In Lodge's *Peerage* each male member of a family appears in his order of succession to the peerage; the names of the sisters of each being placed in their proper order. The above classification represents, therefore, in most cases, the order in which the female members of the principal branches are to be found, and includes the names of most, although not all, the ladies to be found in one volume. There are, in addition, some who have married members of the peerage class, but who, not being by birth of titled family, do not appear under their maiden family name; also, under the heading "collateral branches" are recorded the names of more distant relations than those I have mentioned. I considered, however, that the observations would be numerous enough for the purpose without these: they could be included without much trouble if it were necessary at any future time to supplement the experience.

For such a purpose as the present, it is of course essential to carefully consider the method adopted in the compilation of the work from which the particulars are to be extracted; to see that no form of selection is allowed to disturb the conclusions to be drawn from an examination of the experience; which disturbance might result from either the omission of certain of the sections of lives given above, or from the inclusion of a few, the record of whose names depended specially on their survival to a certain date. For example, in many cases the names of the peer's father's sisters were omitted altogether from the section relating to his family, or sometimes only the "surviving aunts," as they were designated, were mentioned. It was clear that, in such cases as these, it was necessary to refer to preceding volumes to obtain particulars of those who died earlier. Again, where the peerage is of recent creation, only the names of the peer's daughters, or grand-daughters, are

recorded ; but the necessary omission in such cases of his other relations would not cause any disturbance.

I found that, by restricting the data to the particulars in one volume, the time for which a large proportion of the lives would be under observation would be rather too short. To remedy this, all those existing at 31st December 1886 were continued under observation till 1892, if existing at that date, or to the date of their death, if it occurred previously. I did not consider it necessary, however, to include any further marriages.

I have described somewhat fully the various points to be considered, and the errors and omissions to be guarded against, in employing such a body of facts as that contained in the *Peerage*, as the recital of them may not only be of service to any one undertaking a similar investigation, but may also be useful to those who have to consult the volume for other purposes.

In the present instance I have followed the example of Dr. Stark, and considered simply the mortality of females, who have married, without regard to whether they were still married at the time of their death or had previously become widows. It was pointed out, in an editorial note to Dr. Stark's paper, that the inclusion of widows would disturb the conclusions as to the mortality attendant on child-bearing. But in the earlier years after marriage, at any rate, where these bear a very small proportion to the total exposures, the principal features of the mortality cannot be appreciably affected.

The number of lives included in the experience was 2014, of whom 1104 were existing, and 910 had died ; and the total number of years of life was 58,822. The method of tabulation adopted was that recommended by Dr. Sprague in his paper, recently read before the Institute, "On the Tabulation of the Facts extracted from the Records of a Life Office for the purpose of investigating its Mortality Experience." (*J. I. A.* xxxi. 205.) The commencing age, or age at first marriage, was the age at their nearest birthday. Where the date of marriage happened to be exactly equidistant between two birthdays, so that the exact age was $x + \frac{1}{2}$ years, the commencing age was taken as the difference between the years of birth and marriage. When the year of birth or year of marriage only was given, the birthday or the date of marriage was assumed to be 1st July ; so that the commencing age was the difference between the years of birth and marriage. The duration was in all cases taken to be an integral number of years. In the case of the Existing, the observations closed on the anniversaries in 1892 of the dates of marriage ; and all, therefore, were really under observation for an integral number of years. In the case of the Died, the duration was in all cases $n + 1$, where n is the integral number of years since marriage. When the year only of death was given, it was assumed to have taken place on

1st July. But where the years only of death and marriage were given, and n is the difference between those years, the duration was taken alternately as n and $n+1$. The following table gives the number of marriages at each age up to age 60, and the deaths that occurred in each year for fifteen years after marriage :—

TABLE I.

Age at Marriage x	No. of Marriages at Age x	NUMBER OF DEATHS IN YEAR.														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
16	3	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
7	24	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
8	83	...	...	...	...	...	...	...	1	1	1	3	1	1	...	2
9	140	...	...	...	...	1	1	...	...	2	...	...	...	...	...	...
20	177	1	2	2	1	...	2	1	1	2	2	1	...	1	2	1
1	191	1	2	...	1	2	3	...	...	2	2	1	...	4	2	1
2	173	...	3	4	...	2	2	1	2	2	1	2	1	...	1	...
3	174	4	...	1	1	3	2	...	2	...	2	2	1	1	3	...
4	169	3	1	1	2	1	1	...	3	1	5	1	...	...	...	1
5	136	1	1	...	1	...	1	...	...	...	...	3	1	2	1	1
6	133	1	1	...	2	1	1	...	2	1	...	1	...	1	1	3
7	100	...	1	1	1	3	...	...	3	2	2	1	...	...	...	1
8	97	2	1	2	2	1	1	1	1	1	1	...	...	...	...	2
9	77	...	1	...	1	...	1	1	3	...	...	...	...	...	1	1
30	51	...	1	...	...	...	1	...	1	...	1	...	2	1	...	...
1	49	...	1	1	...	...	1	...	...	...	...	...	...	...	...	1
2	41	...	1	1	...	2	...	...	1	...	...	...	1	...	...	...
3	33	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...
4	31	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...
5	18	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...
6	14	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...
7	21	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...
8	9	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...
9	11	...	...	...	...	...	...	1	1	...	...	...	...	...	...	1
40	12	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...
1	15	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...
2	3	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
3	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	4	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
5	3	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
6	5	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
7	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
50	2	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
60	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2013		14	19	18	13	19	18	5	21	14	20	15	9	13	12	15

It will be seen from the above, that the greatest number of marriages occur at age 21, and that a rapid diminution takes place after age 28, only 25 per cent. of the total number occurring after that age. Comparing the distribution as to age with that of the general population, we observe from the following table that the spinsters of the peerage class appear to marry at rather later ages than among all classes.

TABLE II.

Age.	Percentage of Total Marriages.	
	Peerage.	England, 1881.
16-18	5·4	6·2
19	6·9	9·0
20	8·8	11·0
21-24	35·0	43·7
25-29	26·9	20·0
30-34	10·1	5·8
35-39	3·5	2·3
40	3·4	2·0
Totals,	100·0	100·0

Perhaps the most important use that can be made of this investigation is to ascertain to what mortality a female, married at a certain age, is subject from the time of her marriage onwards. And, in the first instance, I shall show how the risk is affected by the time elapsed alone, apart from any change that may be due to increased age, by taking lives of the same present age, and comparing the risk to which they are exposed, according as they have been married one, two, three, etc., years. This can be most conveniently done in the manner adopted by Dr. Sprague to ascertain how the rate of mortality of assured lives is affected by the duration of assurance (*J.I.A.* xv. 334) ; namely, by tabulating the Exposed to Risk and Deaths for each age at marriage and each year thereafter ; and then, having calculated the Expected Deaths by a table exhibiting rates irrespective of the duration of married life, by comparing the ratio of Actual to Expected Deaths at the end of one, two, three, etc., years after marriage. I employed for this purpose tables of the nature specified, computed from the present observations, and the H^F table. If the results obtained by the use of these two agree in their principal features, I think we shall be able to draw conclusions from them, upon which we may safely rely. By this means we can ascertain whether or not the commencement of married

life is attended with greater risk than subsequent periods; and from this conclude whether the first confinement is as dangerous as Dr. Stark would have us believe.

Columns 2, 3, and 4 of the following table give the Exposed to Risk, Deaths, and Adjusted Rates of Mortality, computed from the present observations:—

TABLE III.

Age.	Exposed to Risk.	Deaths.	Adjusted Rate of Mortality.	Rate of Mortality by			Age.	Exposed to Risk.	Deaths.	Adjusted Rate of Mortality.	Rate of Mortality by		
				H.F.	Peerage Females.	Peerage Males.					H.F.	Peerage Females.	Peerage Males.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
16	3	...	·0041	·0071	·0072	·0057		47,498	445				
17	27	...	·0040	·0071	·0076	·0065	58	808	10	·0147	·0207	·0223	·0211
18	110	1	·0039	·0069	·0078	·0077	59	784	17	·0154	·0218	·0237	·0222
19	249	1	·0038	·0067	·0080	·0089	60	752	9	·0166	·0237	·0252	·0235
20	425	1	·0037	·0069	·0081	·0100	61	725	9	·0178	·0259	·0268	·0253
21	615	3	·0042	·0073	·0081	·0108	62	696	10	·0194	·0285	·0287	·0276
22	785	4	·0052	·0079	·0082	·0114	63	668	19	·0211	·0314	·0308	·0303
23	955	9	·0061	·0088	·0082	·0116	64	630	14	·0241	·0345	·0331	·0335
24	1115	9	·0070	·0098	·0082	·0113	65	698	21	·0276	·0374	·0358	·0370
25	1241	8	·0076	·0108	·0083	·0108	66	559	17	·0318	·0402	·0386	·0407
26	1361	12	·0083	·0114	·0084	·0102	67	516	15	·0350	·0434	·0414	·0446
27	1444	12	·0090	·0118	·0085	·0098	68	485	18	·0387	·0470	·0443	·0487
28	1516	14	·0095	·0120	·0086	·0095	69	458	14	·0415	·0510	·0471	·0530
29	1563	16	·0096	·0120	·0088	·0092	70	428	26	·0436	·0556	·0498	·0575
30	1583	16	·0095	·0119	·0089	·0089	71	394	23	·0450	·0619	·0525	·0625
31	1602	14	·0094	·0117	·0090	·0086	72	363	9	·0470	·0692	·0553	·0684
32	1609	12	·0093	·0116	·0093	·0085	73	336	19	·0520	·0771	·0584	·0751
33	1607	20	·0092	·0117	·0095	·0084	74	307	18	·0590	·0858	·0619	·0827
34	1590	14	·0092	·0117	·0097	·0085	75	276	22	·0680	·0949	·0659	·0911
35	1567	10	·0091	·0118	·0101	·0086	76	243	14	·0790	·1040	·0704	·1004
36	1552	25	·0091	·0119	·0104	·0087	77	220	22	·0840	·1098	·0753	·1104
37	1521	10	·0091	·0120	·0107	·0089	78	190	22	·0900	·1151	·0806	·1211
38	1492	9	·0090	·0122	·0110	·0092	79	161	14	·0960	·1193	·0859	·1325
39	1466	9	·0092	·0123	·0112	·0095	80	139	8	·1060	·1218	·0912	·1446
40	1442	14	·0093	·0125	·0114	·0099	81	123	14	·1180	·1236	·0965	...
41	1410	14	·0094	·0127	·0115	·0103	82	104	15	·1300	·1317	·1020	...
42	1365	16	·0096	·0129	·0116	·0107	83	83	12	·1460	·1453	·1078	...
43	1328	11	·0097	·0132	·0117	·0112	84	67	10	·1600	·1628	·1145	...
44	1301	8	·0098	·0134	·0118	·0118	85	55	15	·1760	·1856	·1223	...
45	1263	15	·0099	·0136	·0121	·0123	86	39	6	·1840	·2121	·1316	...
46	1220	17	·0100	·0138	·0124	·0129	87	29	2	·1980	·2370	·1426	...
47	1182	9	·0100	·0139	·0127	·0134	88	26	5	·2100	·2582	·1557	...
48	1151	12	·0101	·0140	·0131	·0140	89	20	5	·2200	·2726	·1705	...
49	1119	9	·0102	·0142	·0135	·0146	90	14	4	·2400	·2750	·1869	...
50	1089	6	·0104	·0145	·0141	·0151	91	9	3	·2700	·2690	·2049	...
51	1060	15	·0106	·0150	·0147	·0156	92	6	2	·3000	·2320	·2239	...
52	1020	10	·0110	·0156	·0154	·0161	93	4	...	·3300	·1797	·2436	...
53	987	11	·0114	·0164	·0162	·0167	94	3	...	·4000	·1857	·2642	...
54	953	16	·0120	·0174	·0172	·3174	95	2	...	·4800	·2086	·2850	...
55	903	14	·0127	·0183	·0184	·0182	96	2	1	·6000	·2562	·3060	...
56	866	9	·0134	·0191	·0196	·0191	97	1	...	·7600	·3377	·3263	...
57	841	10	·0139	·0199	·0209	·0201	98	1	1	1·0000	·5000	·3458	...
	47,498	445						58,822	910				

The rates of mortality in column 4 are those obtained after adjustment by the graphic method, and, for the sake of comparison, I have added in columns 5, 6, and 7 the rates of mortality according to the following tables, viz., H^F, Peerage Females, obtained by Messrs. Bailey and Day (*J.I.A.* ix. 305) and adjusted by Dr. Thiele (*J.I.A.* xvi. 43), and Peerage Males, obtained by Messrs. Bailey and Day (*J.I.A.* ix. 305) and adjusted by Dr. Sprague (*J.I.A.* xxi. 432).

I calculated then the Expected Deaths by the rates given in column 4 and the H^F table, and the ratios of these to the Actual Deaths. As would be expected, these ratios at individual years after marriage were too irregular to give any indication of a law ; and it was necessary to group them before any conclusions could be drawn as to the way in which the duration of married life affects the death-rate.

The following table gives the results after grouping :—

TABLE IV.

Year after Marriage.	Exposed to Risk.	Actual Deaths.	Expected Deaths according to		Ratio of Actual to Expected Deaths.	
			Table III.	H ^F .	(2) ÷ (3) × 100	(2) ÷ (4) × 100
	(1)	(2)	(3)	(4)	(5)	(6)
1	2,014	14	13·3	19·4	106	72
2	2,000	20	14·2	20·1	141	100
3	1,980	18	15·1	20·8	119	87
4-6	5,841	50	49·2	64·5	102	78
7-11	8,974	80	83·5	106·8	96	75
12-19	11,996	108	113·9	152·0	95	71
29-28	10,346	105	113·0	155·7	93	67
29-34	5,298	71	77·3	107·6	92	66
35-39	3,493	67	70·2	96·1	95	70
40-51	5,322	210	203·3	267·6	96	78
Totals,	57,164	743	753·0	1010·6	99	74

Examining first column 5 of the above table, we see that the ratio of Actual to Expected Deaths is highest in the second year after marriage ; that it rapidly diminishes till about the sixth year ; and from that time onwards remains practically constant ; while the ratio in the first year is shown to be less than that of the next few years, but rather higher than at subsequent periods.

Turning now to column 6, we find that the progression of the ratios there given follows closely that of the previous column. We again notice that the most dangerous period of married life appears to be the second year, and that, after diminishing rapidly for a few years, the ratios remain, as we should expect, practically constant.

The only noticeable difference between the two columns is that the ratio of the first year is here rather lower in comparison with later years than in the previous case, and that the diminution ceases rather sooner.

But for the well-known dangers attending child-birth, we might possibly, with the present arrangement of the facts according to duration, be able to trace to some extent the effect of the selection exercised by marriage. By merely weeding out and leaving amongst the unmarried those who are suffering from acute or exceptionally dangerous diseases, or those who are on their death-bed, marriage must lighten the average mortality of those who contract it; and we might—apart from the risk I have referred to—expect to find this more forcibly brought out in the earlier years of married life. The death-rate would be lowest in the first year; increasing in the next few years until an ultimate rate was attained; the mortality still being, however, less than that of the unmarried class, because the effect of the inclusion of many of the selected lives would continue to the end of the table.

Whether this selection would have any very appreciable effect in making the mortality of the married lighter in the first few years after marriage than at subsequent periods, or not, it is clear from the above table that there is some more powerful influence on the death-rate acting in the opposite direction; and to such an extent that, instead of the increasing ratios we might look for, we find them to be for the first few years considerably above, and afterwards diminishing to, those at later periods of married life. We might at once assign as this important factor the additional risk attending the first confinement; but it is better to first give some information as to the relative frequency with which this takes place in each year after marriage. For this purpose I have extracted the following table from Dr. Duncan's work on *Fecundity, Fertility, and Sterility*, giving the number of wives married at different ages who bear their first child in each year:—

TABLE V.

Year after Marriage.	Number of Wives.							Total.
	Mother's Age at Marriage.							
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	
1	94	325	126	44	15	4	...	608
2	409	1259	533	135	49	3	2	2390
3	83	202	88	45	17	2	...	437
4	25	50	35	12	10	1	...	133
5	8	31	13	8	1	...	...	61
6	13	10	3	3	3	...	...	32
7	5	14	6	1	1	...	...	27
8	5	3	1	3	...	...	...	12
9	1	3	1	...	...	...	...	5
10	2	3	...	...	...	...	...	5
11	...	1	...	...	...	...	...	1
12	...	1	2	...	...	...	...	3
13	2	1	1	...	...	...	...	4
14	1	1	...	...	..	...	...	2
15	...	...	...	...	...	...	...	...
16	1	...	...	...	...	...	...	1
17	...	...	...	...	...	..	...	...
18	...	...	...	...	...	..	...	...
19	...	1	...	...	...	...	...	1
	649	1905	809	251	96	10	2	3722

Some remarks upon this table, which was compiled from the Edinburgh and Glasgow Registers of 1855, will be found in Dr. Sprague's paper, "On the Probability that a Marriage entered into at any age will be Fruitful" (*J.I.A.* xxv. 169).

One can hardly fail to notice the striking resemblance in the general features of the above with those of Table IV. Besides confirming the conclusion that the high ratio of the second year is due to the greatest number of first births occurring then—the average time intervening between marriage and the birth of the first child being about seventeen months—a comparison of the two tables affords, I think, a clear explanation of the decreasing ratios in Table IV. In the fourth year we see a great diminution in the number of wives, who then bear their first child; and a corresponding feature is found in the mortality. Also, when that period after marriage has been reached, when no first births occur, or when the number has become very small, the effect is observable in Table IV., where the ratios have become practically constant.

Although the entrants at the higher ages are comparatively few, the results in Table IV. may, to a certain extent, be affected by including those who are past child-bearing; and it may be as well to exclude the older lives. It might have been useful to tabulate the ratios

of Actual to Expected Deaths for, say, quinquennial groups of ages at observation, but the facts are not numerous enough for this.

The following table shows the ratios, after grouping, for ages 16 to 45 inclusive; and in order to see if similar results are obtained when the ages are within smaller limits, and the period of life examined is that at which most births take place, I have shown also the ratios for present ages 16-30. As there were no marriages before age 16, figures will of course be wanting after 30 years in the first, and after 15 years in the second case.

TABLE VI.

PRESENT AGES 16-45.						
Year after Marriage.	Exposed to Risk.	Deaths.			Ratio of Actual to Expected Deaths.	
		Actual.	Expected according to		3 ÷ 4 × 100	3 ÷ 5 × 100
			Table II.	H.F.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	2,000	14	13·2	19·2	106	73
2	1,983	19	14·1	19·9	135	95
3	1,960	16	14·9	20·5	107	78
4-6	5,744	48	48·3	63·4	99	76
7-10	7,024	59	64·4	83·3	91	70
11-17	9,849	85	90·8	119·3	94	71
18-30	6,552	61	62·1	83·5	98	72
Totals,	35,112	302	307·8	409·1	98	74
PRESENT AGES 16-30.						
1	1,728	13	10·6	15·8	123	82
2	1,664	14	11·0	15·9	127	88
3-6	5,634	43	43·5	59·2	99	73
7-12	3,846	35	34·9	45·0	100	75
13-14	118	1	1·1	1·4	91	71
Totals,	12,990	106	101·1	137·3	105	77

Beyond the fact that the above results in no way alter the conclusions at which we have already arrived from Table IV., I do not think there is anything further to be gathered from them. The higher mortality is perhaps not quite so forcibly brought out, especially in the second part of the table. If this slight difference is really a feature of the mortality, and not merely an irregularity, it might be explained by the fact, that we are now considering that period of life at which most births occur; and, while the risk of the first birth is still very pronounced, the danger attending subsequent confinements is also brought out to some extent, especially in the second part of the table.

In an inquiry of this sort, as explained by Dr. Sprague (*J.I.A.*

xix. 412), the particular groupings of years adopted are intended as a means of roughly graduating the results. Various tentative groupings are made, and that which gives the greatest regularity is adopted. Exception to this mode of procedure has been taken by some, on the ground that important points in the curve may be missed; or that—the process being somewhat arbitrary—the results obtained depend upon the skill of the computer. Whatever merit may attach to a grouping according to fixed intervals, where the facts are numerous, and the results are to be used as a basis for further calculations, it is clear that such a course would be of very little use where there is a paucity of data. The results for combined years would still exhibit considerable irregularities; and we should be no nearer obtaining any idea of the true form of the curve. This applies especially to the present case, where the figures, somewhat limited in the aggregate, are still more scanty, when divided up according to age and duration. We must be content if, by a judicious grouping—according to no fixed intervals and seemingly erratic—we can get rid of the irregularities; and ascertain in this way the principal feature of the table. Some of the groups adopted must necessarily include a good many years, but the advantage of taking smaller groups, and thereby making apparent minor points, would be annulled by the loss in regularity. There would be nothing to guide us as to whether these points were really features of the table, or merely irregularities.

Having considered the changes to which the mortality of married females of the same age is subject, according to the time elapsed since marriage, the following death-rates for a group of ages at entry, show the combined effects of the duration of married life and increased age. The Exposed to Risk and Deaths for ages 18-31 at marriage are shown in columns 2 and 3 of the following table; and, in column 4, the rates of mortality obtained after grouping:—

TABLE VII.

Year after Marriage.	Exposed to Risk.	Deaths.	Rate of Mortality.
(1)	(2)	(3)	(4)
1	1,750	11	·0063
2	1,737	16	·0092
3-6	6,810	55	·0081
7-10	6,354	53	·0085
11-14	5,653	51	·0090
15-19	6,238	58	·0093
20-24	5,334	54	·0101
25-30	5,366	60	·0112
Totals,	39,242	358	·0091

From these figures alone we might almost be led to suppose that the higher mortality at the commencement of the table is due to chance, and to assume the rates to be, if ascertained for individual years, practically constant. I must admit that I thought that the above table would have exhibited rather more clearly the features previously brought out. The only reason I can assign for this not being the case, is that allowance must be made for the usual increase we must expect as the lives get older. We find evidence of such increase after a few years; and we learned from the previous results that the mortality has at first a tendency to diminish. It is, therefore, impracticable, unless the facts are considerably more numerous than in the present case, to ascertain exactly where the diminution ends and the increase begins; but I think the grouping I have adopted gives some indication of this.

In conclusion, the following remarks are suggested by an inspection of Table III. and the diagram illustrating it. Female assured lives constitute a special class of their own; and from a comparison of the present rates with those of the Peerage Males we are not able to draw any conclusions as to the additional risk of married female over male assured lives. In the Peerage class the two sexes do not show the same difference as among assured lives. Apart from this, it may be of interest to notice the similarity between columns 4 and 5. While the mortality of the married females is considerably lower than the H^F , the formation of the two curves is seen to be very much the same. This might be expected, as it is generally found that the greater proportion of insurances on female lives are effected on the lives of married women. A comparatively rapid rise from ages 20 to 25 is followed by a mortality nearly constant from 25 to 50. This latter feature is of course one that is found in most experiences of female lives, but it is rather more marked in these two tables. The figures I have brought out satisfactorily explain it. The fresh marriages at each age produce, as shown above, a tendency in the death-rate to diminish; and when we are dealing with a table irrespective of the duration of married life, the mortality does not increase with age to the extent it would otherwise do.

These results show, I think, that an insurance on the life of a married woman should be considered with regard to the time for which she has been married; that those offices, which charge a single extra when marriage has been recently contracted, are justified in their practice; and that it would seem to be advisable, in the case of unmarried women, to allow for an extra premium on marriage.

DIAGRAM SHOWING THE MORTALITY AMONG THE MARRIED FEMALES, FEMALES GENERALLY, AND MALES OF THE PEERAGE CLASS,
 AND AMONG HEALTHY FEMALE ASSURED LIVES, (H^F).