TABLE 22:—LIFE TABLE No. 2, 1935-37—MALES.

(For explanation of calculation *see* Memorandum on p. 222).

KEY TO THE NOTATION.

q_x = the rate of mortality, or the probability of dying in a year. It is the ratio of the number of deaths in the year of age x *to* $x+1$ to the number entering on the year.

p_x = the probability of living a year, or the ratio of the number completing the year of age x to $x+1$ to the number entering on the year.

l_x = the number according to the life table surviving to exact age x.

d_x = the deaths in the year of age x to $x+1$ among lx persons who enter on that year.

L_x = the population according to the life table, or the years of life lived, in the year of age x to $x+1$.

T_x = the population, or the years of life lived, above the moment of age x.

$\mathring{e}_x$ = the complete expectation of life in years, or the total future lifetime which on the average will be passed through by persons aged exactly x.

The following relations hold between these quantities :—

$$p_x = 1 - q_x\ ;\ l_x - l_{x+1} = d_x\ ;\ L_x = \tfrac{1}{2}(l_x + l_{x+1})\ (x > 0)\ ,\ T_x = \sum_{y \geq x} L_y\ ;\ \mathring{e}_x = T_x / l_x.$$

Age. x	l_x	d_x	p_x	q_x	L_x	T_x	$\mathring{e}_x$	Age. x
0	100,000	7,952	·92048	·07952	94,123	5,820,029	58·20	0
1	92,048	1,307	·98580	·01420	91,394	5,725,906	62·21	1
2	90,741	705	·99223	·00777	90,389	5,634,512	62·09	2
3	90,036	420	·99533	·00467	89,826	5,544,123	61·58	3
4	89,616	365	·99593	·00407	89,433	5,454,297	60·86	4
5	89,251	296	·99668	·00332	89,103	5,364,864	60·11	5
6	88,955	230	·99741	·00259	88,840	5,275,761	59·31	6
7	88,725	177	·99800	·00200	88,637	5,186,921	58·46	7
8	88,548	141	·99841	·00159	88,477	5,098,284	57·58	8
9	88,407	122	·99862	·00138	88,346	5,009,807	56·67	9
10	88,285	118	·99866	·00134	88,226	4,921,461	55·75	10
11	88,167	127	·99856	·00144	88,104	4,833,235	54·82	11
12	88,040	143	·99838	·00162	87,968	4,745,131	53·90	12
13	87,897	162	·99816	·00184	87,816	4,657,163	52·98	13
14	87,735	180	·99795	·00205	87,645	4,569,347	52·08	14
15	87,555	195	·99777	·00223	87,458	4,481,702	51·19	15
16	87,360	208	·99762	·00238	87,256	4,394,244	50·30	16
17	87,152	222	·99745	·00255	87,041	4,306,988	49·42	17
18	86,930	246	·99717	·00283	86,807	4,219,947	48·54	18
19	86,684	273	·99685	·00315	86,547	4,133,140	47·68	19
20	86,411	302	·99651	·00349	86,260	4,046,593	46·83	20
21	86,109	325	·99622	·00378	85,947	3,960,333	45·99	21
22	85,784	342	·99601	·00399	85,613	3,874,386	45·16	22
23	85,442	349	·99592	·00408	85,267	3,788,773	44·34	23
24	85,093	347	·99592	·00408	84,920	3,703,506	43·52	24
25	84,746	343	·99596	·00404	84,575	3,618,586	42·70	25
26	84,404	338	·99599	·00401	84,235	3,534,011	41·87	26
27	84,066	340	·99596	·00404	83,896	3,449,776	41·04	27
28	83,726	345	·99588	·00412	83,553	3,365,880	40·20	28
29	83,381	354	·99576	·00424	83,204	3,282,327	39·37	29
30	83,027	364	·99562	·00438	82,845	3,199,123	38·53	30
31	82,663	374	·99548	·00452	82,476	3,116,278	37·70	31
32	82,289	383	·99534	·00466	82,098	3,033,802	36·87	32
33	81,906	392	·99521	·00479	81,710	2,951,704	36·04	33
34	81,514	401	·99508	·00492	81,313	2,869,994	35·21	34
35	81,113	410	·99494	·00506	80,908	2,788,681	34·38	35
36	80,703	422	·99477	·00523	80,492	2,707,773	33·55	36
37	80,281	434	·99459	·00541	80,064	2,627,281	32·73	37
38	79,847	450	·99436	·00564	79,622	2,547,217	31·90	38
39	79,397	468	·99410	·00590	79,163	2,467,595	31·08	39
40	78,929	490	99379	·00621	78,684	2,388,432	30·26	40
41	78,439	516	·99342	00658	78,181	2,309,748	29·45	41
42	77,923	544	·99302	·00698	77,651	2,231,567	28·64	42
43	77,379	573	·99260	·00740	77,093	2,153,916	27·84	43
44	76,806	603	·99215	·00785	76,504	2,076,823	27·04	44

TABLE 22 (contd.):—LIFE TABLE No. 2, 1935-37—**MALES.**

Age. x	l_x	d_x	p_x	q_x	L_x	T_x	$\mathring{e}_x$	Age. x
45	76,203	636	·99165	·00835	75,885	2,000,319	26·25	45
46	75,567	673	·99110	·00890	75,231	1,924,434	25·47	46
47	74,894	712	·99049	·00951	74,538	1,849,203	24·69	47
48	74,182	755	·98982	·01018	73,804	1,774,665	23·92	48
49	73,427	803	·98907	·01093	73,026	1,700,861	23·16	49
50	72,624	853	·98825	·01175	72,197	1,627,835	22·41	50
51	71,771	906	·98738	·01262	71,318	1,555,638	21·68	51
52	70.865	957	·98649	·01351	70,387	1,484,320	20·95	52
53	69,908	1,009	·98557	·01443	69,403	1,413,933	20 23	53
54	68,899	1,062	·98458	·01542	68,368	1,344,530	19 51	54
55	67,837	1,119	·98351	·01649	67,278	1,276,162	18·81	55
56	66,718	1,179	·98233	·01767	66,128	1,208,884	18·12	56
57	65,539	1,245	·98101	·01899	64,917	1,142,756	17·44	57
58	64,294	1,317	·97952	·02048	63,635	1,077,839	16·76	58
59	62,977	1,396	·97784	·02216	62,279	1,014,204	16·10	59
60	61,581	1,482	·97593	·02407	60,840	951,925	15·46	60
61	60,099	1,576	·97377	·02623	59,311	891,085	14·83	61
62	58,523	1,676	·97137	·02863	57,685	831,774	14·21	62
63	56,847	1,776	·96875	·03125	55,959	774,089	13·62	63
64	55,071	1,878	·96590	·03410	54,132	718,130	13·04	64
65	53,193	1,977	·96284	·03716	52,205	663,998	12·48	65
66	51,216	2,070	·95958	·04042	50,181	611,793	11 95	66
67	49,146	2,155	·95615	·04385	48,068	561,612	11·43	67
68	46,991	2,230	·95254	·04746	45,876	513,544	10·93	68
69	44,761	2,292	·94879	·05121	43,615	467,668	10·45	69
70	42,469	2,340	·94490	·05510	41,299	424,053	9·99	70
71	40,129	2,370	·94095	·05905	38,944	382,754	9·54	71
72	37,759	2,381	·93693	·06307	36,569	343,810	9·11	72
73	35,378	2,378	·93279	·06721	34,189	307,241	8 68	73
74	33,000	2,361	·92846	·07154	31,819	273,052	8 27	74
75	30,639	2,333	·92387	·07613	29,473	241,233	7·87	75
76	28,306	2,295	·91892	·08108	27,158	211,760	7·48	76
77	26,011	2,249	·91354	·08646	24,887	184,602	7·10	77
78	23,762	2,195	·90762	·09238	22,664	159,715	6·72	78
79	21,567	2,134	·90104	·09896	20,500	137,051	6 35	79
80	19,433	2,066	·89368	·10632	18,400	116,551	6·00	80
81	17,367	1,989	·88548	·11452	16,372	98,151	5·65	81
82	15,378	1,899	·87651	·12349	14,428	81,779	5·32	82
82	13,479	1,796	·86672	·13328	12,581	67,351	5·00	83
84	11,683	1,682	·85603	·14397	10,842	54,770	4 69	84
85	10,001	1,556	·84439	·15561	9,223	43,928	4 39	85
86	8,445	1,421	·83173	·16827	7,735	34,705	4·11	86
87	7,024	1,279	·81797	·18203	6,384	26,970	3·84	87
88	5,745	1,131	·80305	·19695	5,180	20,586	3 58	88
89	4,614	983·3	·78689	·21311	4,122 3	15,406	3 34	89
90	3,630·7	837·1	·76943	23057	3,212·2	11,284 1	3 11	90
91	2,793·6	696·7	·75061	·24939	2,445 2	8,071 9	2·89	91
92	2,096·9	565·4	·73037	·26963	1,814·2	5,626 7	2 68	92
93	1,531·5	446·2	·70866	·29134	1,308·4	3,812·5	2·49	93
94	1,085 3	341·4	·68544	·31456	914·6	2,504·1	2·31	94
95	743·9	252·4	·66070	·33930	617 7	1,589·5	2 14	95
96	491·5	179·7	·63442	·36558	401·7	971·8	1·98	96
97	311·8	122·7	·60662	·39338	250·4	570·1	1·83	97
98	189·1	79 9	·57735	·42265	149·2	319·7	1·69	98
99	109·2	49 5	·54668	·45332	84·4	170·5	1·56	99
100	59·7	29·0	·51471	·48529	45·2	86 1	1·44	100
101	30·7	15·9	·48158	·51842	22·8	40 9	1·33	101
102	14·8	8·2	·44749	·55251	10·7	18·1	1·22	102
103	6·6	3·9	·41265	·58735	4·6	7·4	1·12	103
104	2·7	1·7	·37734	·62266	1·9	2·8	1·04	104
105	1·0	0·7	·34185	·65815	0·6	0·9	0·90	105

TABLE 22 (contd.):—LIFE TABLE No. 2, 1935-37—**FEMALES.**

Note: See page 218 for Key to Notation.

Age. x	l_x	d_x	p_x	q_x	L_x	T_x	$\mathring{e}_x$	Age. x
0	100,000	6,327	·93673	·06327	95,362	5,961,563	59·62	0
1	93,673	1,226	·98691	·01309	93,060	5,866,201	62·62	1
2	92,447	607	·99343	·00657	92,144	5,773,141	62·45	2
3	91,840	462	·99497	·00503	91,609	5,680,997	61·86	3
4	91,378	347	·99620	·00380	91,204	5,589,388	61·17	4
5	91,031	276	·99697	·00303	90,893	5,498,184	60·40	5
6	90,755	232	·99744	·00256	90,639	5,407,291	59·58	6
7	90,523	205	·99773	·00227	90,421	5,316,652	58·73	7
8	90,318	190	·99790	·00210	90,223	5,226,231	57·86	8
9	90,128	176	·99805	·00195	90,040	5,136,008	56·99	9
10	89,952	166	·99815	·00185	89,869	5,045,968	56·10	10
11	89,786	161	·99821	·00179	89,705	4,956,099	55·20	11
12	89,625	159	·99823	·00177	89,546	4,866,394	54·30	12
13	89,466	162	·99819	·00181	89,385	4,776,848	53·39	13
14	89,304	173	·99806	·00194	89,217	4,687,463	52·49	14
15	89,131	192	·99785	·00215	89,035	4,598,246	51·59	15
16	88,939	215	·99758	·00242	88,832	4,509,211	50·70	16
17	88,724	243	·99726	·00274	88,602	4,420,379	49·82	17
18	88,481	267	·99698	·00302	88,348	4,331,777	48·96	18
19	88,214	296	·99665	·00335	88,066	4,243,429	48·10	19
20	87,918	324	·99631	·00369	87,756	4,155,363	47·26	20
21	87,594	351	·99599	·00401	87,418	4,067,607	46·44	21
22	87,243	372	·99574	·00426	87,057	3,980,189	45·62	22
23	86,871	387	·99555	·00445	86,678	3,893,132	44·82	23
24	86,484	395	·99543	·00457	86,286	3,806,454	44·01	24
25	86,089	402	·99533	·00467	85,888	3,720,168	43·21	25
26	85,687	408	·99524	·00476	85,483	3,634,280	42·41	26
27	85,279	414	·99515	·00485	85,072	3,548,797	41·61	27
28	84,865	421	·99504	·00496	84,655	3,463,725	40·81	28
29	84,444	427	·99494	·00506	84,230	3,379,070	40·02	29
30	84,017	434	99484	·00516	83,800	3,294,840	39·22	30
31	83,583	439	·99475	·00525	83,364	3,211,040	38·42	31
32	83,144	444	99466	·00534	82,922	3,127,676	37·62	32
33	82,700	448	99458	·00542	82,476	3,044,754	36·82	33
34	82,252	452	·99451	·00549	82,026	2,962,278	36·01	34
35	81,800	456	·99443	·00557	81,572	2,880,252	35·21	35
36	81,344	460	·99434	·00566	81,114	2,798,680	34·41	36
37	80,884	468	·99422	·00578	80,650	2,717,566	33·60	37
38	80,416	475	·99409	·00591	80,178	2,636,916	32·79	38
39	79,941	487	·99391	·00609	79,698	2,556,738	31·98	39
40	79,454	501	·99370	·00630	79,203	2,477.040	31·18	40
41	78,953	519	·99343	·00657	78,694	2,397,837	30·37	41
42	78,434	536	·99317	·00683	78.166	2,319,143	29·57	42
43	77,898	555	·99288	·00712	77,620	2,240,977	28·77	43
44	77,343	575	·99257	·00743	77,056	2,163,357	27·97	44
45	76,768	597	·99222	00778	76,469	2,086,301	27·18	45
46	76,171	623	·99182	·00818	75,860	2,009,832	26·39	46
47	75,548	653	·99135	·00865	75,221	1,933,972	25·60	47
48	74,895	688	·99082	·00918	74,551	1,858,751	24·82	48
49	74,207	728	·99019	·00981	73,843	1,784,200	24·04	49
50	73,479	771	·98947	·01053	73,092	1,710,357	23·28	50
51	72,705	824	·98867	·01133	72,293	1,637,265	22·52	51
52	71,881	874	·98784	·01216	71,444	1,564,972	21·77	52
53	71,007	927	·98695	·01305	70,544	1,493,528	21·03	53
54	70,080	983	·98598	·01402	69,588	1,422,984	20·31	54

TABLE 22 (contd.):—LIFE TABLE No. 2, 1935-37—**FEMALES.**

Age. x	l_x	d_x	p_x	q_x	L_x	T_x	$\mathring{e}_x$	Age x
55	69,097	1,041	·98493	·01507	68,577	1,353,396	19·59	55
56	68,056	1,105	·98376	·01624	67,503	1,284,819	18·88	56
57	66,951	1,174	·98247	·01753	66,364	1,217,316	18·18	57
58	65,777	1,248	·98103	·01897	65,153	1,150,952	17·50	58
59	64,529	1,328	·97942	·02058	63,865	1,085,799	16·83	59
60	63,201	1,414	·97762	·02238	62,494	1,021,934	16 17	60
61	61,787	1,507	·97561	·02439	61,034	959,440	15·53	61
62	60,280	1,605	·97337	·02663	59,477	898,406	14·90	62
63	58,675	1,706	·97093	·02907	57,822	838,929	14·30	63
64	56,969	1,806	·96830	·03170	56,066	781,107	13·71	64
65	55,163	1,904	·96548	·03452	54,211	725,041	13·14	65
66	53,259	1,998	·96249	·03751	52,260	670,830	12·60	66
67	51,261	2,084	·95934	·04066	50,219	618,570	12·07	67
68	49,177	2,162	·95604	·04396	48,096	568,351	11·56	68
69	47,015	2,228	·95262	·04738	45,901	520,255	11·07	69
70	44,787	2,280	·94910	·05090	43,647	474,354	10·59	70
71	42,507	2,315	·94553	·05447	41,350	430,707	10·13	71
72	40,192	2,334	·94194	·05806	39,025	389,357	9·69	72
73	37,858	2,337	·93826	·06174	36,689	350,332	9·25	73
74	35,521	2,329	·93443	06557	34,357	313,643	8 83	74
75	33,192	2,311	·93037	·06963	32,036	279,286	8·41	75
76	30,881	2,285	·92600	·07400	29,739	247,250	8·01	76
77	28,596	2,253	·92123	·07877	27,469	217,511	7·61	77
78	26,343	2,214	·91595	·08405	25,236	190,042	7·21	78
79	24,129	2,170	·91006	·08994	23,044	164,806	6·83	79
80	21,959	2,121	·90343	·09657	20,899	141,762	6·46	80
81	19,838	2,062	·89607	·10393	18,807	120,863	6·09	81
82	17,776	1,991	·88801	·11199	16,780	102,056	5·74	82
83	15,785	1,907	·87919	·12081	14,832	85,276	5·40	83
84	13,878	1,810	·86955	·13045	12,973	70,444	5·08	84
85	12,068	1,701	·85903	·14097	11,217	57,471	4·76	85
86	10,367	1,580	·84755	·15245	9,577	46,254	4·46	86
87	8,787	1,449	·83506	·16494	8,063	36,677	4·17	87
88	7,338	1,310	·82147	·17853	6,683	28,614	3·90	88
89	6,028	1,165	·80672	·19328	5,445	21,931	3 64	89
90	4,863	1,017·7	·79073	·20927	4,354 2	16,486·1	3 39	90
91	3,845·3	871·2	·77345	·22655	3,409·7	12,131·9	3·15	91
92	2,974·1	729·3	·75479	·24521	2,609·4	8,722·2	2·93	92
93	2,244·8	595·5	·73471	·26529	1,947·1	6,112·8	2·72	93
94	1,649·3	473 1	·71315	·28685	1,412·7	4,165·7	2·53	94
95	1,176·2	364·5	·69007	·30993	994·0	2,753·0	2·34	95
96	811·7	271·6	·66545	·33455	675·9	1,759·0	2·17	96
97	540·1	194·8	·63928	·36072	442·7	1,083·1	2·01	97
98	345·3	134·1	·61156	·38844	278·2	640·4	1·85	98
99	211·2	88·2	·58234	·41766	167 1	362·2	1·71	99
100	123·0	55·1	·55169	·44831	95·5	195·1	1·59	100
101	67·9	32·6	·51971	·48029	51·6	99·6	1·47	101
102	35·3	18·1	·48653	·51347	26·2	48·0	1·36	102
103	17·2	9·4	·45235	·54765	12·5	21·8	1·27	103
104	7·8	4·5	·41737	·58263	5·6	9·3	1·19	104
105	3·3	2·0	·38188	·61812	2·3	3·7	1·12	105

MEMORANDUM ON THE CONSTRUCTION OF LIFE TABLE No. 2, 1935–37.

Data used in the Construction of the Life Table.

For ages 5 and over the life table data were based on the Census population on 26th April, 1936, and the numbers of deaths in 1935, 1936 and 1937, as recorded in the Annual Reports of the Registrar-General. For the infantile ages the Registrar-General's statistics of births and deaths were used, because in this as in other countries, the numbers of children at ages 0 and 1 are somewhat understated at the Census. The population in each age group was not adjusted to the middle of the Census year, as is usually the practice, because there is no reason to believe that in Ireland the population on 30th June, 1936, would be closer than the population at Census date 26th April, 1936, to the *average* population in the years 1935-37. The grouped population data utilised are given in Table 14 of this Report and the Registrar-General's statistics of births and deaths are appended.

With regard to the mortality data at ages 5 and over, in the ordinary course the simple average number of deaths in each age group in the years 1935, 1936 and 1937 would have been used. It will be evident, however, from the following figures that in the year 1937 mortality was exceptionally high.

Crude Rates of Mortality per 1,000 Population Per Annum.

Year.		*Rate.*	*Year.*		*Rate.*
1925	...	14·6	1932	...	14·6
1926	...	14·0	1933	...	13·7
1927	...	14·8	1934	...	13·2
1928	...	14·2	1935	...	14·0
1929	...	14·6	1936	...	14·4
1930	...	14·2	1937	...	15·3
1931	...	14·6			

The abnormality of mortality in 1937 is thrown into even sharper relief by the quarterly figures: in the first quarter of 1937 the equivalent annual rate was 20·8 compared with 16·7, the average for the five corresponding quarters previous, and 15·6 in the first quarter of 1938. The high mortality in 1937 was in fact due to a severe influenza epidemic.

It is obviously a first essential that the life table should reflect normal mortality conditions at about the time of the Census, so that it could be used with confidence in actuarial computations and for public health purposes during the next few years. It is very difficult, however, to determine what may be regarded as a "normal" mortality experience at any given time. In the present circumstances, there is a strong case for basing the life table on mortality in the single year 1936, but it was considered that the number of deaths recorded in some age-groups was so small as to render likely substantial fortuitous variations in the mortality rates. Eventually it was decided to include the mortality in 1937 in the computation but not to allow it to have its full effect. Instead of weighting mortality equally in the three years 1935, 1936 and 1937, for the actual mortality in 1937 there was substituted in each group a hypothetical figure which represented the simple average in the three years 1935, 1936 and 1937, so that average mortality in each age group for the purpose of Life Table No. 2 is the simple average of the actual mortality in 1935 and 1936, and of this hypothetical figure in 1937. It will be seen that this weighted average is represented by the following formula :—

$$\text{Annual average deaths} = \tfrac{1}{3}\left\{D_{35}+D_{36}+\tfrac{1}{3}(D_{35}+D_{36}+D_{37})\right\} = \tfrac{1}{9}(4D_{35}+4D_{36}+D_{37}).$$

where D_{35} signifies the number of deaths in the age group in 1935, etc. Accordingly, mortality in 1937 has only one-fourth of the "weight" of the mortality in each of the other two years. It is an argument in favour of this somewhat unorthodox procedure that the weighted average mortality as computed by this formula, namely 42,400 (21,908 males and 20,492 females), is very close to the actual mortality in the year 1936, namely 42,586 (21,920 males and 20,666 females), and may be regarded therefore as reflecting mortality conditions in the Census year.

Method of Computation.

The method of computation was identical with that used on the previous occasion, which follows closely on that of Mr. George King* for the construction of English Life Tables Nos. 7 (1901-10) and 8 (1910-12) and adopted with certain modifications by Sir William Watson in the construction of English Life Tables Nos. 9 (1920-22)† and 10 (1930-32).‡

According to this method the life table is based upon the calculation of the functions q_x, the rate of mortality or the probability at exact age x years of dying during the ensuing year. For most ages these functions are based on the life table death-rate m_x, which represents the ratio of the number of deaths at age x (*i.e.*, with average age about $x+\frac{1}{2}$ years) to the population at this age, and which, under general conditions, is related to q_x by the formula :—

$$q_x = \frac{2m_x}{2+m_x}.$$

Mr. King's method involves the computation from the grouped data of "graduated pivotal" values of the populations and of the annual average deaths at certain ages. Mr. King and Sir William Watson used five-year groups for the calculation of pivotal values for most ages. In the construction of the 1925-27 Saorstát Life Table, five-year groups were used from the ages 5–9 to 40–44 (from which the m_x's and accordingly the q_x's from $x=17$ to $x=32$ inclusive were computed) and a partially overlapping ten-year grouping 25–34 to 95–104 (from which the q_x's from $x=40$ to $x=80$ inclusive were found). The broader grouping at the later ages was rendered necessary by the very marked tendency to state ages in numbers ending in the digit 0. The assumption is accordingly implicit in the method that even if the populations at individual ages are not necessarily correct the five-year group totals at the earlier ages and the ten-year group totals at the later ages are dependable. It was recognised that if the five-year group totals could be regarded as correct they should be used throughout. In view of the marked improvement in the statement of ages at the 1936 Census, the desirability of using a five-year grouping at the later ages was carefully considered. It was ultimately decided to adhere to the mixed groups for the following reasons :—

(1) While an improvement has been effected since last Census, Table 11A shows that there is still a marked concentration at ages ending in the digit 0 and accordingly population age groups ending in digits 0–4 must be regarded as overstated and the 5–9 groups as somewhat understated. In this connection the partiality for ages ending in the digit 5 and to a lesser extent in the digits 2 and 8 is very evident.

(2) It cannot be stated definitely (because deaths at ages over 4 are not published by single ages), but it seems very likely, that the concentration on ages ending in the digit 0 would be at least as pronounced in mortality as in population statistics.

(3) Five-year groups for mortality statistics are not available after age 75, and the break-up of the groups 75–84, 85–94 and 95– into five-year groups would involve a substantial element of estimate.

(4) Values of pivotal q_x's based on five-year groups at later ages were computed and found to have lower gradients of increase at certain quinquennial intervals than in the immediate preceding intervals, phenomena for which there appeared to be no biological justification.

From the five-year groups 5–9 to 40–44, graduated pivotal values of the populations and annual average numbers of deaths, and hence the values of q_x, at ages $x=12$, 17, etc., to 37 were calculated, using Mr. King's interpolation formula.§ From the grouping 25–34, 35–44, etc., graduated pivotal values of the population and annual average mortality, and hence q_x, at ages 40, 50, etc., to 90, were computed, using the formula

$$w_{40} = \cdot 1 w_{25-34} + \cdot 105 \triangle w_{25-34} - \cdot 0015 \triangle^2 w_{25-34}.$$

where w_{40} indicates graduated population or deaths at age 40, w_{25-34} the group total and $\triangle w_{25-34}, \triangle^2 w_{25-34}$ the first and second decennial differences. Analogous formulae were used for ages 50, 60, etc.

* Supplement to the 75th Annual Report of the Registrar-General of Births, Deaths and Marriages in England and Wales, Pt. I., Life Tables (Cd. 7512/1914).
† The Registrar-General's Decennial Supplement, England and Wales, 1921. Part I.
‡ The Registrar-General's Decennial Supplement, England and Wales, 1931. Part I.
§ *Op. cit.*, page 49.

The values of q_x from $x=17$ to $x=32$ were calculated by osculatory interpolation from the pivotal q_x's ($x=12$ to $x=37$) [using, with Mr. King,† the function log $(q_x + \cdot 1)$] and from the pivotal q_x's ($x=30$ to $x=90$) the values of q_x by single years from $x=40$ to $x=80$. The values of q_x from $x=33$ to 39 were found by a Lagrangean interpolation from the values of q_{31}, q_{32}, q_{40} and q_{41}.

The values of q_x for ages 0 to 4 were derived solely from deaths in the three years 1935, 1936 and 1937 and from the births registered in each quarter from 1930 to 1937 inclusive, using the formula which Sir Alfred Watson devised for English Life Table No. 9.* It should be observed that the abnormality in the number of deaths in 1937 was confined to the adult ages, so that no modification in the method of calculation of the q_x's at the infantile ages was necessary. Sir Alfred Watson introduced a new formula for the calculation of q_0 in English Life Table No. 10, but this was found to make no appreciable difference in the result as applied to the Irish data and the earlier and simpler formula was retained.

The life table population L_x, or the total number of years of life lived in a year by the l_x, persons who have survived to exact age l_x, is taken as equal to $\frac{1}{2}(l_x + l_{x+1})$ at ages one and over. L_0 represents the sum of l_1 and the number of years of life lived by those who died before reaching age 1, which number is based on the deaths at ages under 1 month, 1–2 months, 2–3 months, 3–6 months and 6–12 months in the years 1935, 1936 and 1937.

From mortality and population data in age groups 2–4, 5–9 and 10–14 years the graduated number of deaths and of population at age 7 (and the value of q_7) were obtained The remaining values of q_x from $x=5$ to $x=16$ were calculated by a Lagrangean interpolation from the known values of q_3, q_4, q_7, q_{12}, q_{17} and q_{18}.

As on the previous occasion, the values of q_x for advanced ages were found from a Makeham graduation (through values of q_x for $x=70$, 80, 90) given by the formula :—

$$\log (1-q_x) = \log s + c^x (c-1) \log a,$$

the constants of which were found to be :—

		Males.	*Females.*
s	=	·9766584	·9770014
a	=	·9996845	·9997362
c	=	1·103847	1·104498

THE ACTUAL-EXPECTED TEST.

In order to show that life tables accurately reflect mortality conditions it is customary to compare in each age group the actual number of deaths with the "expected" number of deaths which represents the group sum product of the Census population and the life table death-rate at each year of life. This test cannot be applied satisfactorily to Irish data on account of the misstatement of ages, particularly the later ages, to which reference has already been made. Such misstatements, resulting in an undue concentration of population at the later ages ending in the digit 0 and to a lesser extent in certain other digits, might result in a marked distortion in the "expected" totals, even if the population age *groups* could be assumed correct. This is due, of course, to the steep gradient of increase in the m_x's within most age groups. In the following table, however, the actual and "expected" numbers of deaths are formally compared, for ages 5 and over.

Ages	Males			Females		
	Actual Deaths 1935–1937 Annual Average	Expected Deaths 1935–1937 Annual Average	Deviation : Expected less Actual	Actual Deaths 1935–1937 Annual Average	Expected Deaths 1935–1937 Annual Average	Deviation : Expected less Actual
5—9 ..	295	297	+ 2	319	317	— 2
10—14 ..	241	239	— 2	254	255	+ 1
15—19 ..	355	361	+ 6	359	352	— 7
20—24 ..	531	524	— 7	507	505	— 2
25—34 ..	899	901	+ 2	979	979	—
35—44 ..	1,113	1,110	— 3	1,099	1,097	— 2
45—54 ..	1,844	1,833	— 11	1,565	1,568	+ 3
55—64 ..	3,408	3,415	+ 7	2,883	2,882	— 1
65—74 ..	5,455	5,317	—138	4,909	4,869	— 40
75—84 ..	3,599	3,534	— 65	3,872	3,759	—113
85—94 ..	881	979	+ 98	1,113	1,205	+ 92
95 and over ..	97	106	+ 9	118	166	+ 48
Total 5 years and over	18,718	18,616	—102	17,977	17,954	— 23

* *Op. cit.*, page 28.
† *Op. cit.*, page 50, *et seq.*

It will be observed that at all age groups up to 55–64 the correspondence is very satisfactory but at the later ages the actual and expected deviate to some extent, as had been anticipated. The discrepancy at ages 85 and over for females is large but compensates for a marked tendency in the other direction at ages 65–84. The aggregate deviation of 102 for males and 23 for females for all ages over 5 may in all the circumstances be regarded as not unsatisfactory.

The possibility of adjusting the rates of mortality in the later age groups so as to bring the expected deaths into closer conformity with actual deaths was considered. It was decided, however, that any empirical alteration of the rates made with a view to bringing together the two series would imply a degree of reliance on the single year populations at the later ages which these data do not warrant.

The Results.

The functions tabulated in the life table are of smooth graduation. The mortality rate qx declines from birth to age 10 for males and 12 for females. Thereafter it increases constantly with age for females but in the case of males there is a slight recession from ages 24 to 26. The mortality rates for females are higher than those of males for ages 7–12 and 16–40 inclusive and at all other ages they are lower. The mortality rates and expectations of life at ages 0, 10, etc., to 80 in 1925-27 and 1935-37 are compared in the following tables :—

RATES OF MORTALITY, q_x

Age x years	Males		Females	
	Life Table No. 1, 1925-27	Life Table No. 2, 1935-37	Life Table No. 1, 1925-27	Life Table No. 2, 1935-37
0	·07716	·07952	·06346	·06327
10	·00166	·00134	·00195	·00185
20	·00401	·00349	·00447	·00369
30	·00529	·00438	·00590	·00516
40	·00705	·00621	·00747	·00630
50	·01130	·01175	·01139	·01053
60	·02428	·02407	·02394	·02238
70	·04913	·05510	·04647	·05090
80	·11889	·10632	·10049	·09657

EXPECTATION OF LIFE (YEARS), $\mathring{e}_x$

Age x years	Males		Females	
	Life Table No. 1 1925-27	Life Table No. 2 1935-37	Life Table No. 1 1925-27	Life Table No. 2 1935-37
0	57·37	58·20	57·93	59·62
10	55·20	55·75	54·92	56·10
20	46·40	46·83	46·36	47·26
30	38·39	38·53	38·60	39·22
40	30·43	30·26	30·83	31·18
50	22·67	22·41	23·19	23·28
60	15·75	15·46	16·36	16·17
70	10·02	9·99	10·72	10·59
80	5·81	6·00	6·47	6·46

The marked decline in the mortality rate at the younger ages (except age 0) since 1925–27 will be noted. The increase recorded in q_{70} is a reflection of the substantial increase in the number of deaths registered in the age group 65–74, without a proportionate increase in the corresponding population group, although, as will be seen from Table 1 of this Report, an increase has occurred in this group.

At each year of age up to age 34 for males, and up to age 54 for females, the expectation of life shows an improvement since 1925–27. The increase in the expectation of life at birth was 0·83 years for males and 1·69 years for females. In this, as in most other countries, females have a higher expectation of life at all ages, although the margin in favour of females is unusually low in Ireland at most ages.

DATA USED IN CONSTRUCTION OF LIFE TABLE No. 2.

(Source: Annual Reports of the Registrar-General).

TABLE A.—DEATHS OF PERSONS AGED 5 YEARS AND OVER REGISTERED IN EACH OF THE YEARS 1935, 1936 AND 1937.

Age last birthday	Males				Females			
	1935	1936	1937	Weighted Annual Average*	1935	1936	1937	Weighted Annual Average*
5—9 ..	305	283	302	295	325	323	275	319
10—14 ..	251	235	221	241	299	212	241	254
15—19 ..	388	318	367	355	369	347	368	359
20—24 ..	536	541	472	531	503	514	499	507
25—29 ..	464	455	468	460	465	539	504	502
30—34 ..	481	394	450	439	482	461	522	477
35—39 ..	531	512	500	519	568	541	515	550
40—44 ..	599	592	583	594	556	535	578	549
45—49 ..	784	661	744	724	624	621	684	629
50—54 ..	1,142	1,085	1,168	1,120	930	935	963	936
55—59 ..	1,341	1,399	1,493	1,384	1,136	1,170	1,292	1,168
60—64 ..	1,981	2,027	2,191	2,024	1,705	1,705	1,794	1,715
65—69 ..	2,273	2,414	2,644	2,377	1,809	2,066	2,005	1,945
70—74 ..	2,917	3,166	3,370	3,078	2,944	2,937	3,149	2,964
75—84 ..	3,442	3,631	4,096	3,599	3,694	3,895	4,495	3,872
85—94 ..	840	890	1,012	881	1,083	1,128	1,175	1,113
95 and over ..	92	107	78	97	124	111	120	118
Total 5 and over	18,367	18,710	20,159	18,718	17,616	18,040	19,179	17,977

* See Memorandum, p. 222.

TABLE B.—DEATHS AT AGES 0–4, 1931-37.

Year	Age last birthday in years				
	0	1	2	3	4
	Males				
1931 ..	2,229	486	215	147	124
1932 ..	2,290	469	217	148	111
1933 ..	2,150	382	218	127	98
1934 ..	2,086	288	148	124	89
1935 ..	2,337	393	215	123	106
1936 ..	2,414	362	207	123	104
1937 ..	2,311	417	207	126	111
	Females				
1931 ..	1,706	452	227	140	101
1932 ..	1,770	396	209	167	111
1933 ..	1,592	371	190	143	113
1934 ..	1,578	295	141	102	108
1935 ..	1,651	349	164	132	90
1936 ..	1,895	336	179	127	89
1937 ..	1,810	359	170	127	110

TABLE C.—BIRTHS REGISTERED IN EACH QUARTER, 1930-37.

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total
	Males				
1930 ..	7,417	7,904	7,568	7,024	29,913
1931 ..	7,438	7,783	7,338	6,850	29,409
1932 ..	6,913	7,542	7,671	6,716	28,842
1933 ..	7,038	7,645	7,708	6,990	29,381
1934 ..	7,491	7,704	7,552	7,078	29,825
1935 ..	7,386	7,669	7,707	7,136	29,898
1936 ..	7,347	7,714	7,537	7,004	29,602
1937 ..	6,907	7,741	7,628	6,617	28,893
	Females				
1930 ..	7,064	7,401	7,294	6,681	28,440
1931 ..	6,866	7,359	7,072	6,380	27,677
1932 ..	6,672	7,262	7,129	6,335	27,398
1933 ..	6,655	7,366	7,214	6,748	27,983
1934 ..	7,030	7,305	7,182	6,555	28,072
1935 ..	7,028	7,250	7,234	6,856	28,368
1936 ..	7,087	7,386	7,380	6,660	28,513
1937 ..	6,647	7,311	7,380	6,257	27,595