

REMARRIAGE EXPERIENCE UNDER THE  
PENSION ACT OF CANADA

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INTRODUCTION

**A**T THE present time, considerable interest is being shown in the addition of dependents' benefits to employee pension plans. In many instances, it is provided that annuities payable to widows cease upon remarriage as well as upon death. For such plans, an appropriate table of remarriage rates is required for the valuation of widows' benefits.

Earlier this year, Mr. A. M. Niessen presented to the Society a paper entitled "A New Remarriage Table," based on the remarriage experience of widows receiving monthly benefits under the Railroad Retirement Act. However, there are still few published accounts of actuarial studies of the contingency of remarriage. It therefore appears timely to present the results of a recent investigation of the remarriage experience of a sizable group of Canadian widows.

EXPERIENCE

The experience studied was that of widows who were awarded pensions during the period from August 4, 1914, to December 31, 1957, under the Pension Act of Canada and under government administrative orders which preceded that Act.

The Pension Act became law in 1919, replacing government orders that had authorized the granting of pensions to disabled members of the Canadian forces and their dependents and to dependents of deceased members of the forces, where disability or death was attributable to military service in World War I. The sections of the 1919 Act relating to widows' pensions provided for

- a) a scale of pensions ranging from \$40 to \$180 monthly, depending upon the rank of the serviceman at his death or discharge,
- b) termination of pension upon remarriage with a final payment equal to one year's pension, and
- c) suspension or cancellation of pension as a result of misconduct.

Amendments to the Pension Act from time to time since 1919 have changed the scale of pensions and the provisions relating to qualification for pension. As the Act is now constituted, pensions are awarded to widows of members of the forces

- a) who died as a result of injury or disease or aggravation thereof attributable to, or incurred during, military service in World War I or World War II, or
- b) who died as a result of injury or disease or aggravation thereof arising out of, or directly connected with, military service either in peace time or in the nonpermanent active militia or the reserve army during World War II.

The scale of widows' pensions ranges from \$115 to \$180 monthly, depending upon the rank of the serviceman at his death or discharge. Pensions cease upon remarriage, but may be reinstated if widowhood again occurs within a period of five years after remarriage. As in the original Act, pensions are terminated as a result of misconduct.

A previous study of the remarriage experience under the Pension Act was made in 1946. The purpose of that study was to develop remarriage rates for calculation of the capitalized values of widows' pensions awarded under the Pension Act and for the valuation of widows' benefits included in the government pension programs for the public service of Canada, the Canadian armed forces and the Royal Canadian Mounted Police Force. The study covered the experience of widows who were awarded pensions from the beginning of World War I to March 31, 1939, followed to the 1945 anniversaries of dates of widowhood.

During recent valuations of the government pension plans, it became evident that the rates of remarriage of widow pensioners have become substantially higher than the rates developed during the 1946 study. It was therefore decided to make a study of the Pension Act experience of widows who were awarded pensions from the beginning of World War I to December 31, 1957, and, in an attempt to ascertain the effect on remarriage of sociological and economic changes that have taken place since the beginning of World War II, to study the experience for the 1940-48 and 1949-57 periods separately.

To enable these studies to be made, the Canadian Pension Commission provided, on punched cards, the following details for each widow who was awarded a pension under the Pension Act or previous government order prior to January 1, 1958:

1. Canadian Pension Commission number
2. Date of widowhood
3. Date of award of pension
4. Date of birth
5. Date of termination
6. Cause of termination:

- (i) Remarriage
- (ii) Death
- (iii) Other

The volume of data for each of the three periods under study is indicated in the accompanying table.

Period	Survivors	New Entrants	Remarriages	Deaths	Other Term'ns	Existing
Aug. 4, 1914, to Dec. 31, 1957.....	0	43,208	13,865	6,930	1,039	21,374
Jan. 1, 1940, to Dec. 31, 1948.....	10,437	17,093	5,139	1,820	271	20,300
Jan. 1, 1949, to Dec. 31, 1957.....	20,300	8,091	3,326	3,475	216	21,374

DEVELOPMENT OF REMARRIAGE RATES

For each of the three periods under study, exposures were calculated by age nearest birthday at widowhood and curtate duration from widowhood. Crude rates were then computed for each completed year of widowhood for quinquennial ages at widowhood. Examination of these rates revealed that

- a) rates of remarriage were substantially lower for almost all ages at widowhood and durations during the pre-1940 period than during the 1940-57 period, and the upward trend continued to a modest degree during the latter period;
- b) for practical purposes, it could be assumed that rates of remarriage were zero for age 70 and over;
- c) for the younger ages at widowhood, the incidence of remarriage was dependent, to a significant degree, on duration from widowhood for the first fourteen years after widowhood; and
- d) the rates of remarriage during the first year of widowhood were considerably lower for the 1940-48 period than for either the pre-1940 or the 1949-57 periods.

The low rates of remarriage during the first year of widowhood that prevailed during the 1940-48 period may have resulted from some combination of three factors, namely, a scarcity of marriageable males during the peak war years, a disinclination of widows who went into war work before or shortly after widowhood to marry in the first year or so after widowhood, and the nonentry into the experience of a group of "war" widows who remarried before being awarded pensions.

As a result of the preliminary studies, it was decided

- a) to develop a table of remarriage rates from the experience of the 1940-57 period,
- b) to graduate the rates into zero at age 70,
- c) to use a 14-year select period for ages at widowhood up to age 56 and to reduce the select period by one year for each age at widowhood over age 56, and
- d) to adjust upward the duration zero rates for the younger ages to minimize the effect of the abnormally low rates of the 1940-48 period.

The graphic method of graduation was used throughout. Rates from the graphs were read off to four places of decimals, rounded to three places and smoothed by examination of differences. The final rates are listed in Table 1.

In Table 2 are shown exposures, actual remarriages, expected remarriages according to the graduated rates, and ratios of actual to expected remarriages for four Pension Act experiences, namely,

- a) the 1940-57 experience of widows awarded pensions from August 4, 1914, to December 31, 1957,
- b) the experience of widows awarded pensions from August 4, 1914, to March 31, 1939, followed to the 1945 anniversaries of dates of widowhood,
- c) the 1940-48 experience of widows awarded pensions from August 4, 1914, to December 31, 1948, and
- d) the 1949-57 experience of widows awarded pensions from August 4, 1914, to December 31, 1957.

#### APPLICATION

It might appear that a table of remarriage rates with a long select period is not a practical one, particularly since two decrements are involved in the construction of the financial functions required for the valuation of widows' benefits that cease upon either remarriage or death. Ordinarily, however, only annuity values are required. There is, therefore, seldom any need to construct a multiple decrement table and columns of commutation functions since annuity values may be calculated almost directly from the basic rates.

For example, if, for age  $x$ , the rates of remarriage and death are  $q_x^r$  and  $q_x^d$ , respectively, the probability of decrement occurring between ages  $x$  and  $x + 1$  as a result of either remarriage or death may be calculated as  $q_x^r + q_x^d - q_x^r \cdot q_x^d$ . A table of annuity values may then be computed directly by a formula of the nature  $a_x = v p_x (1 + a_{x+1})$ .

TABLE 1  
SELECT AND ULTIMATE REMARRIAGE RATES\*

AGE AT WIDOWHOOD	DURATION FROM WIDOWHOOD														Ultimate	At-TAINED AGE
	0	1	2	3	4	5	6	7	8	9	10	11	12	13		
16	.122	.266	.300	.290	.267	.239	.209	.181	.154	.129	.107	.090	.077	.068	.061	30
17	.113	.249	.283	.273	.251	.224	.197	.170	.144	.120	.100	.083	.071	.062	.056	31
18	.103	.233	.265	.256	.235	.210	.184	.159	.134	.112	.093	.077	.065	.057	.052	32
19	.094	.217	.247	.239	.219	.196	.172	.148	.125	.104	.086	.071	.060	.053	.048	33
20	.085	.201	.229	.222	.203	.182	.159	.137	.116	.096	.079	.065	.055	.049	.044	34
21	.077	.186	.212	.206	.188	.168	.147	.126	.106	.088	.072	.060	.051	.045	.040	35
22	.069	.172	.195	.190	.173	.155	.135	.115	.097	.080	.066	.055	.047	.041	.037	36
23	.062	.159	.178	.174	.159	.142	.123	.105	.088	.073	.060	.050	.043	.038	.034	37
24	.056	.146	.163	.159	.145	.129	.112	.095	.080	.066	.055	.046	.039	.034	.031	38
25	.050	.133	.148	.144	.132	.117	.101	.086	.072	.060	.050	.042	.035	.031	.028	39
26	.045	.121	.134	.130	.119	.105	.091	.077	.065	.054	.045	.038	.032	.028	.025	40
27	.040	.110	.121	.117	.107	.094	.081	.069	.058	.048	.040	.034	.029	.025	.022	41
28	.036	.099	.108	.105	.096	.084	.073	.062	.052	.043	.036	.031	.026	.022	.020	42
29	.032	.089	.096	.093	.085	.075	.065	.055	.046	.039	.033	.028	.023	.020	.018	43
30	.029	.079	.086	.083	.076	.067	.058	.049	.041	.035	.029	.025	.021	.018	.016	44
31	.026	.071	.077	.074	.068	.060	.052	.044	.037	.031	.026	.022	.019	.016	.014	45
32	.024	.063	.069	.066	.060	.053	.046	.039	.033	.027	.023	.020	.017	.014	.012	46
33	.022	.056	.061	.059	.053	.047	.041	.034	.029	.024	.021	.018	.015	.013	.011	47
34	.020	.049	.054	.052	.047	.042	.036	.030	.026	.022	.018	.015	.013	.011	.010	48
35	.018	.043	.048	.046	.042	.037	.032	.027	.023	.019	.016	.013	.011	.010	.009	49
36	.016	.038	.043	.041	.037	.033	.028	.024	.020	.017	.014	.012	.010	.009	.008	50
37	.014	.034	.038	.037	.033	.029	.025	.021	.018	.015	.012	.010	.009	.008	.007	51
38	.013	.030	.034	.033	.029	.026	.022	.019	.016	.013	.011	.009	.008	.007	.006	52
39	.012	.027	.030	.029	.026	.023	.019	.016	.014	.011	.009	.008	.007	.006	.005	53
40	.011	.024	.027	.026	.023	.020	.017	.014	.012	.010	.008	.007	.006	.005	.004	54
41	.010	.021	.024	.023	.020	.018	.015	.012	.010	.009	.007	.006	.005	.004	.004	55
42	.009	.019	.021	.020	.018	.016	.013	.011	.009	.008	.006	.005	.004	.004	.003	56
43	.008	.017	.019	.018	.016	.014	.011	.009	.008	.007	.005	.004	.004	.003	.003	57
44	.007	.015	.017	.016	.014	.012	.010	.008	.007	.006	.005	.004	.003	.003	.002	58
45	.006	.013	.015	.014	.012	.010	.009	.007	.006	.005	.004	.003	.003	.002	.002	59
46	.006	.011	.013	.012	.010	.009	.008	.006	.005	.004	.003	.003	.002	.002	.002	60
47	.005	.010	.011	.010	.009	.008	.007	.006	.005	.004	.003	.002	.002	.002	.001	61
48	.005	.009	.010	.009	.008	.007	.006	.005	.004	.003	.002	.002	.002	.001	.001	62
49	.004	.008	.009	.008	.007	.006	.005	.004	.003	.003	.002	.002	.001	.001	.001	63
50	.004	.007	.008	.007	.006	.005	.004	.004	.003	.002	.002	.001	.001	.001	.001	64
51	.004	.006	.007	.006	.005	.004	.004	.003	.002	.002	.001	.001	.001	.001	.001	65
52	.003	.005	.006	.005	.004	.004	.003	.003	.002	.001	.001	.001	.001	.001	0	66
53	.003	.004	.005	.004	.004	.003	.003	.002	.002	.001	.001	.001	.001	0	0	
54	.003	.004	.004	.004	.003	.003	.002	.002	.001	.001	.001	.001	0	0	0	
55	.002	.003	.004	.003	.003	.002	.002	.002	.001	.001	.001	0	0	0	0	
56	.002	.003	.003	.003	.002	.002	.002	.001	.001	.001	0	0	0	0	0	
57	.002	.002	.003	.002	.002	.002	.001	.001	.001	0	0	0	0	0	0	
58	.001	.002	.002	.002	.002	.001	.001	.001	0	0	0	0	0	0	0	
59	.001	.002	.002	.002	.001	.001	.001	0	0	0	0	0	0	0	0	
60	.001	.001	.002	.001	.001	.001	0	0	0	0	0	0	0	0	0	
61	.001	.001	.001	.001	.001	0	0	0	0	0	0	0	0	0	0	
62	.001	.001	.001	.001	.001	0	0	0	0	0	0	0	0	0	0	
63	.001	.001	.001	.001	0	0	0	0	0	0	0	0	0	0	0	
64	.001	.001	.001	0	0	0	0	0	0	0	0	0	0	0	0	
65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

\* Based on the 1940-57 experience of widows awarded pensions under the Pension Act of Canada from August 4, 1914, to December 31, 1957.

TABLE 2  
EXPOSURES, ACTUAL REMARRIAGES, EXPECTED REMARRIAGES  
ACCORDING TO THE RATES GIVEN IN TABLE 1, AND  
RATIOS OF ACTUAL TO EXPECTED REMARRIAGES

AGE GROUP AT WIDOWHOOD AND PERIOD OF EXPOSURE*	DURATION 0				DURATION 1			
	Exposed	Actual	Expected	A/E Ratio	Exposed	Actual	Expected	A/E Ratio
16-20 (a) . . . . .	898	43	81.3	0.53	866	179	182.7	0.98
(b) . . . . .	391	54	36.5	1.48	416	96	89.7	1.07
(c) . . . . .	852	37	77.2	0.48	823	167	173.6	0.96
(d) . . . . .	46	6	4.1	†	43	12	9.1	1.32
21-25 (a) . . . . .	4,624	184	286.9	0.64	4,474	710	705.3	1.01
(b) . . . . .	2,083	158	126.6	1.25	2,265	323	351.0	0.92
(c) . . . . .	4,407	171	273.8	0.62	4,241	667	669.4	1.00
(d) . . . . .	217	13	13.1	0.99	233	43	35.9	1.20
26-30 (a) . . . . .	3,657	102	135.2	0.75	3,595	355	362.9	0.98
(b) . . . . .	2,847	115	102.9	1.12	3,189	290	314.8	0.92
(c) . . . . .	3,286	90	121.9	0.74	3,194	324	323.6	1.00
(d) . . . . .	371	12	13.3	0.90	401	31	39.3	0.79
31-35 (a) . . . . .	2,082	42	46.7	0.90	2,101	119	121.8	0.98
(b) . . . . .	2,860	75	63.1	1.19	3,178	194	179.9	1.08
(c) . . . . .	1,678	31	37.9	0.82	1,671	91	97.4	0.93
(d) . . . . .	404	11	8.8	1.25	430	28	24.4	1.15
36-40 (a) . . . . .	1,267	14	16.8	0.83	1,303	39	40.0	0.98
(b) . . . . .	2,297	31	30.8	1.01	2,533	82	79.1	1.04
(c) . . . . .	916	9	12.2	†	932	25	28.9	0.87
(d) . . . . .	351	5	4.6	†	371	14	11.1	1.26
41-45 (a) . . . . .	1,297	8	10.3	†	1,363	22	22.8	0.96
(b) . . . . .	1,594	14	13.0	1.08	1,708	37	29.9	1.24
(c) . . . . .	841	8	6.7	†	895	9	14.9	†
(d) . . . . .	456	0	3.6	†	468	13	7.9	1.65
46-50 (a) . . . . .	1,652	11	7.9	1.39	1,722	16	15.3	1.05
(b) . . . . .	983	5	4.8	†	1,026	7	9.5	†
(c) . . . . .	951	7	4.7	†	972	7	8.7	†
(d) . . . . .	701	4	3.2	†	750	9	6.6	†
51-55 (a) . . . . .	1,892	6	5.7	†	1,931	14	8.5	1.65
(b) . . . . .	683	3	2.1	†	698	1	3.2	†
(c) . . . . .	865	3	2.7	†	850	4	3.8	†
(d) . . . . .	1,027	3	3.0	†	1,081	10	4.7	2.13
56-60 (a) . . . . .	1,909	0	2.6	†	1,836	8	3.8	†
(b) . . . . .	409	0	0.7	†	412	0	1.0	†
(c) . . . . .	663	0	0.9	†	647	3	1.4	†
(d) . . . . .	1,246	0	1.7	†	1,189	5	2.4	†
61-65 (a) . . . . .	1,565	1	1.2	†	1,462	2	1.2	†
(b) . . . . .	222	0	0.1	†	227	0	0.2	†
(c) . . . . .	549	0	0.4	†	515	1	0.4	†
(d) . . . . .	1,016	1	0.8	†	947	1	0.8	†
66-70 (a) . . . . .	964	0	0	†	672	3	0	†
(b) . . . . .	91	0	0	†	68	0	0	†
(c) . . . . .	302	0	0	†	227	1	0	†
(d) . . . . .	662	0	0	†	445	2	0	†
Total (a) . . . . .	21,807	411	594.6	0.69	21,325	1,467	1,464.3	1.00
(b) . . . . .	14,460	455	380.6	1.20	15,720	1,030	1,058.3	0.97
(c) . . . . .	15,310	356	538.4	0.66	14,967	1,299	1,322.1	0.98
(d) . . . . .	6,497	55	56.2	0.98	6,358	168	142.2	1.18

\* (a) 1940-57 period; (b) 1914-39 widows followed to 1945 anniversaries of dates of widowhood; (c) 1940-48 period; (d) 1949-57 period.

† Less than 10 remarriages.

TABLE 2—Continued

AGE GROUP AT WIDOWHOOD AND PERIOD OF EXPOSURE*	DURATION 2				DURATION 3			
	Exposed	Actual	Expected	A/E Ratio	Exposed	Actual	Expected	A/E Ratio
16-20 (a).....	686	172	164.6	1.04	512	113	118.6	0.95
(b).....	320	64	78.8	0.81	255	50	60.7	0.82
(c).....	653	164	156.5	1.05	455	106	105.4	1.01
(d).....	33	8	8.1	†	57	7	13.2	†
21-25 (a).....	3,754	728	663.8	1.10	3,007	531	517.3	1.03
(b).....	1,939	273	337.0	0.81	1,651	231	278.8	0.83
(c).....	3,527	690	624.9	1.10	2,608	493	450.2	1.10
(d).....	227	38	38.9	0.98	399	38	67.1	0.57
26-30 (a).....	3,222	352	355.7	0.99	2,838	331	302.3	1.09
(b).....	2,905	280	313.3	0.89	2,622	234	273.8	0.85
(c).....	2,814	304	312.1	0.97	2,276	281	243.9	1.15
(d).....	408	48	43.6	1.10	562	50	58.4	0.86
31-35 (a).....	1,975	122	125.0	0.98	1,827	114	110.6	1.03
(b).....	3,003	175	186.0	0.94	2,836	160	168.7	0.95
(c).....	1,549	99	98.3	1.01	1,320	93	80.0	1.16
(d).....	426	23	26.7	0.86	507	21	30.6	0.69
36-40 (a).....	1,284	38	44.3	0.86	1,269	38	42.4	0.90
(b).....	2,471	92	86.7	1.06	2,386	72	80.7	0.89
(c).....	907	28	31.5	0.89	835	26	28.0	0.93
(d).....	377	10	12.8	0.78	434	12	14.4	0.83
41-45 (a).....	1,376	20	26.1	0.77	1,393	24	25.0	0.96
(b).....	1,680	32	33.2	0.96	1,640	21	30.7	0.68
(c).....	906	13	17.1	0.76	884	18	16.0	1.13
(d).....	470	7	9.0	†	509	6	9.0	†
46-50 (a).....	1,727	11	17.4	0.63	1,713	16	15.6	1.03
(b).....	1,027	10	10.8	0.93	1,016	5	9.6	†
(c).....	930	8	9.5	†	851	7	7.9	†
(d).....	797	3	7.9	†	862	9	7.7	†
51-55 (a).....	1,890	11	9.8	1.12	1,818	11	8.1	1.36
(b).....	701	2	3.9	†	693	3	3.1	†
(c).....	798	3	4.2	†	735	3	3.2	†
(d).....	1,092	8	5.6	†	1,083	8	4.9	†
56-60 (a).....	1,716	7	4.1	†	1,584	3	3.2	†
(b).....	415	1	1.1	†	410	1	1.0	†
(c).....	621	2	1.5	†	576	1	1.2	†
(d).....	1,095	5	2.6	†	1,008	2	2.0	†
61-65 (a).....	1,356	5	1.2	†	1,242	5	0.9	†
(b).....	225	0	0.2	†	224	0	0.2	†
(c).....	481	1	0.4	†	433	3	0.3	†
(d).....	875	4	0.8	†	809	2	0.6	†
66-70 (a).....	428	0	0	†	206	0	0	†
(b).....	47	0	0	†	19	0	0	†
(c).....	141	0	0	†	69	0	0	†
(d).....	287	0	0	†	137	0	0	†
Total (a).....	19,414	1,466	1,412.0	1.04	17,409	1,186	1,144.0	1.04
(b).....	14,733	929	1,051.0	0.88	13,752	777	907.3	0.86
(c).....	13,327	1,312	1,256.0	1.04	11,042	1,031	936.1	1.10
(d).....	6,087	154	156.0	0.99	6,367	155	207.9	0.75

TABLE 2—Continued

AGE GROUP AT WIDOWHOOD AND PERIOD OF EXPOSURE*	DURATION 4				DURATION 5			
	Exposed	Actual	Expected	A/E Ratio	Exposed	Actual	Expected	A/E Ratio
16-20 (a) . . . . .	395	81	83.8	0.97	310	58	59.1	0.98
(b) . . . . .	199	28	43.4	0.65	167	28	32.7	0.86
(c) . . . . .	241	54	51.0	1.06	92	21	17.4	1.21
(d) . . . . .	154	27	32.8	0.82	218	37	41.7	0.89
21-25 (a) . . . . .	2,457	405	385.0	1.05	2,035	288	283.2	1.02
(b) . . . . .	1,403	161	216.1	0.75	1,238	104	169.1	0.62
(c) . . . . .	1,424	262	225.1	1.16	537	86	75.6	1.14
(d) . . . . .	1,033	143	159.9	0.89	1,498	202	207.6	0.97
26-30 (a) . . . . .	2,474	245	241.0	1.02	2,200	199	187.9	1.06
(b) . . . . .	2,389	178	227.7	0.78	2,222	141	185.9	0.76
(c) . . . . .	1,332	138	130.8	1.06	586	52	50.0	1.04
(d) . . . . .	1,142	107	110.2	0.97	1,614	147	137.9	1.07
31-35 (a) . . . . .	1,690	93	92.7	1.00	1,585	80	76.9	1.04
(b) . . . . .	2,672	112	144.2	0.78	2,550	89	121.7	0.73
(c) . . . . .	859	40	47.0	0.85	476	19	22.8	0.83
(d) . . . . .	831	53	45.7	1.16	1,109	61	54.1	1.13
36-40 (a) . . . . .	1,266	38	37.7	1.01	1,255	40	33.0	1.21
(b) . . . . .	2,305	56	69.4	0.81	2,246	37	59.9	0.62
(c) . . . . .	695	17	20.6	0.83	571	15	14.8	1.01
(d) . . . . .	571	21	17.1	1.23	684	25	18.2	1.37
41-45 (a) . . . . .	1,399	18	22.1	0.81	1,389	18	19.2	0.94
(b) . . . . .	1,610	22	26.4	0.83	1,578	12	22.9	0.52
(c) . . . . .	808	12	12.9	0.93	728	3	10.1	†
(d) . . . . .	591	6	9.2	†	661	15	9.1	1.65
46-50 (a) . . . . .	1,679	13	13.4	0.97	1,638	14	11.3	1.24
(b) . . . . .	1,009	3	8.3	†	1,003	6	7.1	†
(c) . . . . .	762	5	6.1	†	669	5	4.7	†
(d) . . . . .	917	8	7.3	†	969	9	6.6	†
51-55 (a) . . . . .	1,723	4	6.5	†	1,627	6	5.1	†
(b) . . . . .	686	1	2.6	†	680	0	2.2	†
(c) . . . . .	678	1	2.5	†	615	3	1.9	†
(d) . . . . .	1,045	3	4.0	†	1,012	3	3.2	†
56-60 (a) . . . . .	1,438	2	2.4	†	1,293	0	1.9	†
(b) . . . . .	403	0	0.8	†	398	0	0.7	†
(c) . . . . .	512	1	0.8	†	452	0	0.7	†
(d) . . . . .	926	1	1.6	†	841	0	1.2	†
61-65 (a) . . . . .	1,132	0	0.6	†	851	3	0	†
(b) . . . . .	224	0	0.1	†	179	0	0	†
(c) . . . . .	383	0	0.2	†	279	0	0	†
(d) . . . . .	749	0	0.4	†	572	3	0	†
Total (a) . . . . .	15,653	899	885.2	1.02	14,183	706	677.6	1.04
(b) . . . . .	12,900	561	739.0	0.76	12,261	417	602.2	0.69
(c) . . . . .	7,694	530	497.0	1.07	5,005	204	198.0	1.03
(d) . . . . .	7,959	369	388.2	0.95	9,178	502	479.6	1.05

\* (a) 1940-57 period; (b) 1914-39 widows followed to 1945 anniversaries of dates of widowhood; (c) 1940-48 period; (d) 1949-57 period.

† Less than 10 remarriages.



TABLE 2—Continued

AGE GROUP AT WIDOWHOOD AND PERIOD OF EXPOSURE*	DURATION 6				DURATION 7			
	Exposed	Actual	Expected	A/E Ratio	Exposed	Actual	Expected	A/E Ratio
16-20 (a) . . . . .	249	46	41.7	1.10	200	26	28.8	0.90
(b) . . . . .	134	11	23.0	0.48	120	10	17.6	0.57
(c) . . . . .	36	4	6.1	†	11	1	1.7	†
(d) . . . . .	213	42	35.6	1.18	189	25	27.1	0.92
21-25 (a) . . . . .	1,725	216	208.2	1.04	1,493	138	153.0	0.90
(b) . . . . .	1,130	88	133.6	0.66	1,041	80	104.9	0.76
(c) . . . . .	225	27	27.2	0.99	73	9	7.3	†
(d) . . . . .	1,500	189	181.0	1.04	1,420	129	145.7	0.89
26-30 (a) . . . . .	1,975	143	145.7	0.98	1,813	140	113.2	1.24
(b) . . . . .	2,081	102	150.6	0.68	1,982	76	121.3	0.63
(c) . . . . .	285	19	20.9	0.91	126	11	7.7	1.43
(d) . . . . .	1,690	124	124.8	0.99	1,687	129	105.5	1.22
31-35 (a) . . . . .	1,496	56	62.7	0.89	1,437	50	50.4	0.99
(b) . . . . .	2,454	66	101.2	0.65	2,379	39	82.2	0.47
(c) . . . . .	302	7	12.2	†	208	8	6.8	†
(d) . . . . .	1,194	49	50.5	0.97	1,229	42	43.6	0.96
36-40 (a) . . . . .	1,248	20	27.8	0.72	1,251	13	23.6	0.55
(b) . . . . .	2,200	40	49.5	0.81	2,130	18	40.7	0.44
(c) . . . . .	496	7	10.8	†	437	3	8.1	†
(d) . . . . .	752	13	17.0	0.76	814	10	15.5	0.65
41-45 (a) . . . . .	1,380	16	15.9	1.01	1,367	7	12.9	†
(b) . . . . .	1,554	9	18.6	†	1,500	8	14.5	†
(c) . . . . .	657	5	7.7	†	570	2	5.4	†
(d) . . . . .	723	11	8.2	1.34	797	5	7.5	†
46-50 (a) . . . . .	1,588	8	9.3	†	1,536	8	7.6	†
(b) . . . . .	979	5	6.0	†	931	3	4.8	†
(c) . . . . .	575	2	3.4	†	510	2	2.5	†
(d) . . . . .	1,013	6	5.9	†	1,026	6	5.1	†
51-55 (a) . . . . .	1,537	2	4.3	†	1,446	4	3.5	†
(b) . . . . .	661	1	2.0	†	623	0	1.5	†
(c) . . . . .	546	0	1.6	†	484	0	1.2	†
(d) . . . . .	991	2	2.7	†	962	4	2.3	†
56-60 (a) . . . . .	1,189	1	1.4	†	1,104	4	0.9	†
(b) . . . . .	386	0	0.5	†	347	0	0.3	†
(c) . . . . .	408	0	0.5	†	371	2	0.3	†
(d) . . . . .	781	1	0.9	†	733	2	0.6	†
61-65 (a) . . . . .	599	0	0	†	374	0	0	†
(b) . . . . .	134	1	0	†	79	0	0	†
(c) . . . . .	188	0	0	†	106	0	0	†
(d) . . . . .	411	0	0	†	268	0	0	†
Total (a) . . . . .	12,986	508	517.0	0.98	12,021	390	393.9	0.99
(b) . . . . .	11,713	323	485.0	0.67	11,132	234	387.8	0.60
(c) . . . . .	3,718	71	90.4	0.79	2,896	38	41.0	0.93
(d) . . . . .	9,268	437	426.6	1.02	9,125	352	352.9	1.00

TABLE 2—Continued

AGE GROUP AT WIDHOOD AND PERIOD OF EXPOSURE*	DURATION 8				DURATION 9			
	Exposed	Actual	Expected	A/E Ratio	Exposed	Actual	Expected	A/E Ratio
16-20 (a).....	172	21	21.0	1.00	148	11	15.0	0.73
(b).....	109	7	13.6	†	102	9	10.7	†
(c).....	4	0	0.5	†	3	0	0.3	†
(d).....	168	21	20.5	1.02	145	11	14.7	0.75
21-25 (a).....	1,344	119	115.7	1.03	1,212	86	86.6	0.99
(b).....	961	46	81.3	0.57	914	41	63.9	0.64
(c).....	17	0	1.3	†	10	0	0.7	†
(d).....	1,327	119	114.4	1.04	1,202	86	85.9	1.00
26-30 (a).....	1,656	85	86.5	0.98	1,558	78	67.7	1.15
(b).....	1,898	49	97.5	0.50	1,847	54	79.2	0.68
(c).....	68	3	3.5	†	66	2	2.7	†
(d).....	1,588	82	83.0	0.99	1,492	76	65.0	1.17
31-35 (a).....	1,401	38	41.6	0.91	1,391	37	34.4	1.08
(b).....	2,324	39	68.5	0.57	2,265	33	55.6	0.59
(c).....	195	3	5.4	†	224	7	5.3	†
(d).....	1,206	35	36.2	0.97	1,167	30	29.1	1.03
36-40 (a).....	1,251	19	20.1	0.95	1,249	26	16.6	1.57
(b).....	2,082	19	34.0	0.56	2,014	24	27.1	0.89
(c).....	410	4	6.5	†	417	10	5.4	1.85
(d).....	841	15	13.6	1.10	832	16	11.2	1.43
41-45 (a).....	1,351	12	10.7	1.12	1,326	11	9.4	1.17
(b).....	1,421	11	11.7	0.94	1,341	8	9.6	†
(c).....	505	6	4.0	†	463	7	3.4	†
(d).....	846	6	6.7	†	863	4	6.0	†
46-50 (a).....	1,471	2	6.0	†	1,410	3	4.5	†
(b).....	874	1	3.7	†	819	3	2.7	†
(c).....	468	0	2.0	†	435	2	1.4	†
(d).....	1,003	2	4.0	†	975	1	3.1	†
51-55 (a).....	1,351	2	2.4	†	1,252	3	1.8	†
(b).....	565	0	1.0	†	511	1	0.7	†
(c).....	431	0	0.8	†	385	1	0.6	†
(d).....	920	2	1.6	†	867	2	1.2	†
56-60 (a).....	1,013	0	0.4	†	930	3	0.2	†
(b).....	302	0	0.2	†	264	0	0.1	†
(c).....	326	0	0.2	†	280	1	0.1	†
(d).....	687	0	0.2	†	650	2	0.1	†
61-65 (a).....	161	0	0	†	.....	.....	.....	.....
(b).....	29	0	0	†	.....	.....	.....	.....
(c).....	39	0	0	†	.....	.....	.....	.....
(d).....	122	0	0	†	.....	.....	.....	.....
Total (a).....	11,171	298	304.4	0.98	10,476	258	236.2	1.09
(b).....	10,565	172	311.5	0.55	10,077	173	249.6	0.69
(c).....	2,463	16	24.2	0.66	2,283	30	19.9	1.51
(d).....	8,708	282	280.2	1.01	8,193	228	216.3	1.05

\* (a) 1940-57 period; (b) 1914-39 widows followed to 1945 anniversaries of dates of widowhood; (c) 1940-48 period; (d) 1949-57 period.

† Less than 10 remarriages.

TABLE 2—Continued

AGE GROUP AT WIDOWHOOD AND PERIOD OF EXPOSURE*	DURATION 10				DURATION 11			
	Exposed	Actual	Expected	A/E Ratio	Exposed	Actual	Expected	A/E Ratio
16-20 (a) . . . . .	135	13	11.2	1.16	121	6	8.4	†
(b) . . . . .	95	2	8.2	†	91	5	6.5	†
(c) . . . . .	3	0	0.3	†	3	0	0.3	†
(d) . . . . .	132	13	10.9	1.19	118	6	8.1	†
21-25 (a) . . . . .	1,114	65	65.8	0.99	1,034	53	50.9	1.04
(b) . . . . .	874	46	50.6	0.91	824	33	39.8	0.83
(c) . . . . .	15	1	0.9	†	18	0	0.9	†
(d) . . . . .	1,099	64	64.9	0.99	1,016	53	50.0	1.06
26-30 (a) . . . . .	1,471	50	53.4	0.94	1,421	55	43.9	1.25
(b) . . . . .	1,796	39	64.4	0.61	1,745	37	53.4	0.69
(c) . . . . .	83	0	3.0	†	110	4	3.4	†
(d) . . . . .	1,388	50	50.4	0.99	1,311	51	40.5	1.26
31-35 (a) . . . . .	1,372	27	28.7	0.94	1,349	31	24.0	1.29
(b) . . . . .	2,202	31	45.7	0.68	2,139	25	37.5	0.67
(c) . . . . .	260	8	5.3	†	293	5	5.1	†
(d) . . . . .	1,112	19	23.4	0.81	1,056	26	18.9	1.38
36-40 (a) . . . . .	1,225	14	13.5	1.04	1,204	15	11.1	1.35
(b) . . . . .	1,932	16	21.3	0.75	1,864	10	17.5	0.57
(c) . . . . .	429	4	4.7	†	438	3	4.0	†
(d) . . . . .	796	10	8.8	1.14	766	12	7.1	1.69
41-45 (a) . . . . .	1,295	9	7.0	†	1,251	9	5.5	†
(b) . . . . .	1,276	6	7.1	†	1,226	2	5.5	†
(c) . . . . .	440	4	2.4	†	411	2	1.9	†
(d) . . . . .	855	5	4.6	†	840	7	3.6	†
46-50 (a) . . . . .	1,348	0	3.4	†	1,261	7	2.8	†
(b) . . . . .	764	1	1.9	†	718	2	1.5	†
(c) . . . . .	409	0	1.1	†	384	2	0.9	†
(d) . . . . .	939	0	2.3	†	877	5	1.9	†
51-55 (a) . . . . .	1,155	0	1.2	†	1,068	2	1.0	†
(b) . . . . .	465	0	0.5	†	423	0	0.4	†
(c) . . . . .	354	0	0.5	†	332	0	0.4	†
(d) . . . . .	801	0	0.7	†	736	2	0.6	†
56-60 (a) . . . . .	717	1	0	†	505	0	0	†
(b) . . . . .	196	0	0	†	143	0	0	†
(c) . . . . .	208	0	0	†	147	0	0	†
(d) . . . . .	509	1	0	†	358	0	0	†
Total (a) . . . . .	9,832	179	184.2	0.97	9,214	178	147.6	1.21
(b) . . . . .	9,600	141	199.7	0.71	9,173	114	162.1	0.70
(c) . . . . .	2,201	17	18.2	0.93	2,136	16	16.9	0.95
(d) . . . . .	7,631	162	166.0	0.98	7,078	162	130.7	1.24

TABLE 2—Continued

AGE GROUP AT WIDOWHOOD AND PERIOD OF EXPOSURE*	DURATION 12				DURATION 13			
	Exposed	Actual	Expected	A/E Ratio	Exposed	Actual	Expected	A/E Ratio
16-20 (a) . . . . .	108	4	6.3	†	71	3	3.7	†
(b) . . . . .	85	2	5.2	†	81	1	4.3	†
(c) . . . . .	4	0	0.3	†	4	0	0.3	†
(d) . . . . .	104	4	6.0	†	67	3	3.4	†
21-25 (a) . . . . .	892	44	37.2	1.18	558	17	20.5	0.83
(b) . . . . .	791	24	32.4	0.74	764	13	27.6	0.47
(c) . . . . .	21	0	0.8	†	26	1	0.9	†
(d) . . . . .	871	44	36.4	1.21	532	16	19.6	0.82
26-30 (a) . . . . .	1,267	37	32.8	1.13	881	25	19.6	1.28
(b) . . . . .	1,692	32	43.4	0.74	1,648	20	36.5	0.55
(c) . . . . .	134	5	3.4	†	155	5	3.4	†
(d) . . . . .	1,133	32	29.4	1.09	726	20	16.2	1.23
31-35 (a) . . . . .	1,250	17	18.9	0.90	984	8	12.5	†
(b) . . . . .	2,082	24	31.2	0.77	2,022	12	25.9	0.46
(c) . . . . .	322	5	4.8	†	340	5	4.2	†
(d) . . . . .	928	12	14.1	0.85	644	3	8.3	†
36-40 (a) . . . . .	1,146	5	9.2	†	1,030	10	7.1	1.41
(b) . . . . .	1,785	7	14.4	†	1,725	7	12.3	†
(c) . . . . .	437	1	3.5	†	430	2	3.0	†
(d) . . . . .	709	4	5.7	†	600	8	4.1	†
41-45 (a) . . . . .	1,186	4	4.6	†	1,094	2	3.5	†
(b) . . . . .	1,168	3	4.6	†	1,118	0	3.7	†
(c) . . . . .	373	1	1.5	†	346	0	1.1	†
(d) . . . . .	813	3	3.1	†	748	2	2.4	†
46-50 (a) . . . . .	1,149	2	2.0	†	1,039	1	1.7	†
(b) . . . . .	675	1	1.2	†	627	0	0.9	†
(c) . . . . .	354	0	0.7	†	323	0	0.7	†
(d) . . . . .	795	2	1.3	†	716	1	1.0	†
51-55 (a) . . . . .	970	0	0.8	†	892	2	0.4	†
(b) . . . . .	390	0	0.3	†	359	1	0.2	†
(c) . . . . .	301	0	0.3	†	283	2	0.2	†
(d) . . . . .	669	0	0.5	†	609	0	0.2	†
56-60 (a) . . . . .	315	0	0	†	141	0	0	†
(b) . . . . .	95	0	0	†	48	0	0	†
(c) . . . . .	92	0	0	†	40	0	0	†
(d) . . . . .	223	0	0	†	101	0	0	†
Total (a) . . . . .	8,283	113	111.8	1.01	6,690	68	69.0	0.99
(b) . . . . .	8,763	93	132.7	0.70	8,392	54	111.4	0.48
(c) . . . . .	2,038	12	15.3	0.78	1,947	15	13.8	1.09
(d) . . . . .	6,245	101	96.5	1.05	4,743	53	55.2	0.96

\* (a) 1940-57 period; (b) 1914-39 widows followed to 1945 anniversaries of dates of widowhood; (c) 1940-48 period; (d) 1949-57 period.

† Less than 10 remarriages.

TABLE 2—Continued

AGE GROUP AT WIDOWHOOD AND PERIOD OF EXPOSURE*	TOTAL SELECT—DURATIONS 0 TO 13			
	Exposed	Actual	Expected	A/E Ratio
16-20 (a) . . . . .	4,871	776	826.2	0.94
(b) . . . . .	2,565	367	430.9	0.85
(c) . . . . .	3,184	554	590.9	0.94
(d) . . . . .	1,687	222	235.3	0.94
21-25 (a) . . . . .	29,723	3,584	3,579.4	1.00
(b) . . . . .	17,878	1,621	2,012.7	0.81
(c) . . . . .	17,149	2,407	2,359.0	1.02
(d) . . . . .	12,574	1,177	1,220.4	0.96
26-30 (a) . . . . .	30,028	2,197	2,147.8	1.02
(b) . . . . .	30,863	1,647	2,064.7	0.80
(c) . . . . .	14,515	1,238	1,230.3	1.01
(d) . . . . .	15,513	959	917.5	1.05
31-35 (a) . . . . .	21,940	834	846.9	0.98
(b) . . . . .	34,966	1,074	1,311.4	0.82
(c) . . . . .	9,697	421	432.5	0.97
(d) . . . . .	12,243	413	414.4	1.00
36-40 (a) . . . . .	17,248	329	343.2	0.96
(b) . . . . .	29,970	511	623.4	0.82
(c) . . . . .	8,350	154	182.0	0.85
(d) . . . . .	8,898	175	161.2	1.09
41-45 (a) . . . . .	18,467	180	195.0	0.92
(b) . . . . .	20,414	185	231.4	0.80
(c) . . . . .	8,827	90	105.1	0.86
(d) . . . . .	9,640	90	89.9	1.00
46-50 (a) . . . . .	20,933	112	118.2	0.95
(b) . . . . .	12,451	52	72.8	0.71
(c) . . . . .	8,593	47	54.3	0.87
(d) . . . . .	12,340	65	63.9	1.02
51-55 (a) . . . . .	20,552	67	59.1	1.13
(b) . . . . .	8,138	13	23.7	0.55
(c) . . . . .	7,657	20	23.9	0.84
(d) . . . . .	12,895	47	35.2	1.34
56-60 (a) . . . . .	15,690	29	20.9	1.39
(b) . . . . .	4,228	2	6.4	†
(c) . . . . .	5,343	10	7.6	1.32
(d) . . . . .	10,347	19	13.3	1.43
61-65 (a) . . . . .	8,742	16	5.1	3.14
(b) . . . . .	1,543	1	0.8	†
(c) . . . . .	2,973	5	1.7	†
(d) . . . . .	5,769	11	3.4	3.24
66-70 (a) . . . . .	2,270	3	0	†
(b) . . . . .	225	0	0	†
(c) . . . . .	739	1	0	†
(d) . . . . .	1,531	2	0	†
Total (a) . . . . .	190,464	8,127	8,141.8	1.00
(b) . . . . .	163,241	5,473	6,778.2	0.81
(c) . . . . .	87,027	4,947	4,987.3	0.99
(d) . . . . .	103,437	3,180	3,154.5	1.01

\* (a) 1940-57 period; (b) 1914-39 widows followed to 1945 anniversaries of dates of widowhood; (c) 1940-48 period; (d) 1949-57 period.

† Less than 10 remarriages.

TABLE 2—Continued

ATTAINED AGE GROUP AND PERIOD OF EXPOSURE*	ULTIMATE			
	Exposed	Actual	Expected	A/E Ratio
30-34 (a).....	46	0	2.2	†
(b).....	157	3	7.4	†
(c).....	3	0	0.2	†
(d).....	43	0	2.0	†
35-39 (a).....	495	16	16.1	0.99
(b).....	2,162	26	68.7	0.38
(c).....	122	5	3.8	†
(d).....	373	11	12.3	0.89
40-44 (a).....	2,011	38	38.4	0.99
(b).....	8,064	71	156.1	0.45
(c).....	1,306	26	24.5	1.06
(d).....	705	12	13.9	0.86
45-49 (a).....	6,733	71	72.2	0.98
(b).....	15,571	87	171.2	0.51
(c).....	5,374	53	57.6	0.92
(d).....	1,359	18	14.6	1.23
50-54 (a).....	15,159	63	87.0	0.72
(b).....	19,884	55	118.8	0.46
(c).....	11,048	40	64.2	0.62
(d).....	4,111	23	22.8	1.01
55-59 (a).....	24,230	70	66.3	1.06
(b).....	18,496	29	52.6	0.55
(c).....	14,461	32	40.1	0.80
(d).....	9,769	38	26.2	1.45
60-64 (a).....	28,459	38	34.1	1.11
(b).....	12,865	17	16.0	1.06
(c).....	13,683	22	16.7	1.32
(d).....	14,776	16	17.4	0.92
65-69 (a).....	25,662	14	5.5	2.55
(b).....	6,842	5	1.8	†
(c).....	9,499	7	2.3	†
(d).....	16,163	7	3.2	†
70 and over				
(a).....	42,927	28	0	.....
(b).....	6,144	0	0	†
(c).....	6,957	7	0	†
(d).....	35,970	21	0	.....
Total (a).....	145,722	338	321.8	1.05
(b).....	90,185	293	592.6	0.49
(c).....	62,453	192	209.4	0.92
(d).....	83,269	146	112.4	1.30

\* (a) 1940-57 period; (b) 1914-39 widows followed to 1945 anniversaries of dates of widowhood; (c) 1940-48 period; (d) 1949-57 period.

† Less than 10 remarriages.

CONCLUSION

The table of remarriage rates presented was designed for use in the valuation of widows' benefits included in the pension plans for Canadian government employees. It is hoped that the rates may be sufficiently representative of the remarriage experience of other groups of widows for use in estimating values of payments dependent upon remarriage.

## DISCUSSION OF PRECEDING PAPER

A. M. NIESSEN:

Mr. Clarke's paper is a welcome addition to the still meager literature on the incidence of remarriage among widows. It is the more valuable because it provides information on widows receiving benefits under a governmental program basically different from either OASI or railroad retirement. Perhaps in due time similar data will also become available for widows in the general population and for widows receiving benefits under pension plans.

I was tempted to make certain comparisons between Mr. Clarke's remarriage rates and those developed by the Railroad Retirement Board and shown in my paper presented to this Society in the spring of this year. However, the value of such comparisons appears to be doubtful for the following reasons:

1. The period of investigation is not the same—1940–57 for Mr. Clarke's study and 1951–56 for our study.
2. Mr. Clarke's data are presumably for widows with and without minor children while our data for ages under 60 are only for widows with minor children.
3. The benefit scales under the Canadian Pension Act are substantially higher than for our program.

The different characteristics of the two experiences probably account in large measure for the differences in the remarriage rates and in the annuity values. I would, therefore, hesitate to use Mr. Clarke's data as proof that the incidence of remarriage of widows is substantially different in our two countries, although this may very well be the case.

Mr. Clarke justifies the use of a long select period (14 years versus 5 years in my table) on the grounds that annuity values can easily be built up from the remarriage and mortality rates alone without the necessity of calculating all the usual mortality table columns. This is true only when there is no need for temporary or deferred annuity values, as is the case under the provisions of the Canadian Pension Act. In our case (as in the case of OASI), temporary and deferred annuity values are needed, so that Mr. Clarke's method would not conveniently provide all the values needed. Furthermore, a complete double decrement table is extremely useful for quickly answering a variety of questions relating to the probability of remarriage within a specified period, the probability of surviving unremarried, expectation of unremarried life, etc. It is mainly



for these practical reasons that we decided on a short select period. Another reason for our preference is the paucity of data when too many breakdowns are introduced. Apparently, Mr. Clarke also experienced some difficulties in this area, since in many places his Table 2 shows very small actual numbers of remarriages.

Mr. Clarke's study has an extremely valuable feature in that it shows in Table 2 data for four periods of investigation. This is the type of information which Professor Mayerson asked for when he discussed my remarriage table.