REPORT OF COMMITTEE
ON
DISABILITY EXPERIENCE

ACTUARIAL SOCIETY OF AMERICA
MAY, 1926

REPORT
of
COMMITTEE
on
Joint Investigation of Experience of American and Canadian Companies with Reference to Total and Permanent Disability Benefits

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NOTE:—On account of the short experience among policies carrying Total and Permanent Disability Benefits and, particularly in case of Disabled Lives, of the paucity of data, the results of this investigation are somewhat inconclusive. In arriving at such practical results as net annual premiums and reserves for active and for disabled lives, basic tables are used which are to a certain extent hypothetical as explained herein. For these reasons the Committee with great hesitation includes in its Report rates of premiums, reserves, etc., and herewith cautions readers that they may or may not be applicable in individual cases according to circumstances. (See "Warning" at close of Report).

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REPORT OF
COMMITTEE ON DISABILITY EXPERIENCE

AT the annual meeting of the Actuarial Society on the 21st and 22nd of May, 1924, the following resolution was passed:

> "That a special committee be appointed by the President to consider the question of conducting a joint disability experience of American and Canadian companies to determine, if possible, the suitability of Hunter's Disability Table with regard to (1) the rate of disability according to both age at issue and duration of policy, and (2) the rate of mortality after disability according to both age at disablement and duration of disability and to furnish any other information which might be considered helpful in construction of premiums and reserves, in underwriting and in dealing with claims."

The Committee appointed by the President of the Society, Mr. A. B. Wood, was representative of American and Canadian companies, large and small. It was as follows:

E. E. Cammack, Aetna
James D. Craig, Metropolitan
John K. Gore, Prudential
Robert Henderson, Equitable Life
W. A. Hutcheson, Mutual Life
Henry Moir, United States Life
T. A. Phillips, Minnesota Mutual
W. A. P. Wood, Canada Life
Arthur Hunter, New York Life, Chairman

It was decided to take up in the first place the question of preparing rates of disability among "active lives," and of mortality and recovery among disabled lives. These questions were felt to be more urgent than those dealing with underwriting and with claims, especially in view of the opinion expressed by a number of actuaries (a) that the rates of premium now charged were too small, and (b) that the rates of reserve now carried for disability claims were too high under certain forms of policy.

In the opinion of the Committee an investigation of the rates of disability under the older* forms of disability benefits (now discontinued) would be of academic value only. Under the earlier forms, such as the waiver of premium, the practice of the companies in approving claims, was to adhere more closely to the policy definition as to what constituted total and permanent disability than was their subsequent practice, and the terms of the policies in other respects (*e. g.* dating back commencement of benefits prior to the filing of disability claim, etc.) were more strictly adhered to; hence, the rates of disability heretofore experienced under the older forms were lower than under the present forms of policy, and the rates of recovery much lower than under present conditions.

The investigation into the rates of disability was therefore limited to policies of the type now generally issued, *i. e.* those providing for monthly annuity disability benefits. With minor exceptions, no company had issued policies with monthly annuity disability benefits until 1917, and the majority did not do so until 1919 or 1920. This limitation naturally resulted in a short period of exposure to risk of disablement and in a still shorter experience after disability. The records of *all* classes of claims, however, whatever the type of benefit, were obtained from the companies so that the rates of death and of recovery among disabled lives might be investigated for each form of the benefit. The Committee felt that it would have been preferable to delay the investigation until data extending over a longer period could be accumulated, but in view of the strong desire of the Convention of Insurance Commissioners to obtain such information as was now available, it proceeded with its task.

As the data submitted by the various companies had to be combined and as there was considerable diversity in the forms of benefits granted, the Committee felt that the most satisfactory results would be obtained with a minimum of effort if the data were obtained from only a relatively small number of companies.

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* The companies did not commence issuing the various benefits at the same time, and the benefits provided for by the various companies' policies were by no means uniform, as later explained, but the years given hereunder indicate approximately when the use of each type became general:

(a) Waiver of premium, or waiver of premium and instalment of sum insured—about 1911; (b) Annual income in place of instalment—about 1917; (c) Monthly income, in place of annual income—about 1920; and (d) same as (c) but with "90 Day Clause" added—about 1922.

The list of the twenty-nine companies which took part in the investigation and which met the expenses of preparing their own data is as follows:

AMERICAN (23)

Aetna Life Insurance Company
Connecticut General Life Insurance Company
Connecticut Mutual Life Insurance Company
Equitable Life Assurance Society
Equitable Life Insurance Company of Iowa
Fidelity Mutual Life Insurance Company
Guardian Life Insurance Company of America
Home Life Insurance Company
John Hancock Mutual Life Insurance Company
Massachusetts Mutual Life Insurance Company
Metropolitan Life Insurance Company (New York)
Mutual Life Insurance Company of New York
National Life Insurance Company (Vermont)
New England Mutual Life Insurance Company
New York Life Insurance Company
Pacific Mutual Life Insurance Company of California
Penn Mutual Life Insurance Company
Phoenix Mutual Life Insurance Company
Provident Mutual Life Insurance Company of Philadelphia
Prudential Insurance Company of America
State Mutual Life Assurance Company
Travelers Insurance Company
Union Central Life Insurance Company

CANADIAN (6)

Canada Life Assurance Company
Confederation Life Association
London Life Insurance Company
Manufacturers Life Insurance Company
North American Life Assurance Company
Sun Life Assurance Company of Canada

SECTION A

Collection and Compilation of Material

In connection with restricting the material to the above companies it should be mentioned that it was necessary, first, to analyze the disability provisions in the policies of the various companies, and second, to study each company's practice in acting upon individual claims for disability benefits. This practice, when such benefits were first issued, conformed literally to the contract, but later on, many companies became more liberal in interpreting the terms of the contract. Such study and analysis were necessary in order that reasonably homogeneous groups might result when the data were combined. The majority of the companies had gradually changed their attitude, which meant that their experience up to a certain time would theoretically fall into one group and thereafter into another group. By including all the companies granting disability benefits the amount of data would not have been materially increased, while the amount of labor and expense incident to the greater variation of contracts would have been much increased. This part of the problem, which involves the form of policy, the construction placed upon it by the companies, and the extent to which claims for disability were admitted in excess of those strictly covered by the policy will be considered later.

Exposures

To facilitate the work each company was asked to furnish sheets giving the exposed to risk, but not individual policy cards. The exposed to risk were to be given by policy years in groups of five years of age at entry, *i.e.,* ages 15 to 19, 20 to 24, etc. The material was generally taken by the companies from the valuation sheets (after exclusion of business which was in any respect sub-standard) which gave the exposure by calendar years, but as the material was desired by policy years, the Actuary of each company was asked to make the necessary adjustment. Suggestions were made to the contributing companies as to the best way of translating data from calendar to policy years (see Appendix A). To further facilitate the work the data for obtaining the rate of disability were confined to the three principal plans of insurance—Ordinary Life, 20 Payment Life, and 20 Year Endowment—but the companies in which long term Endowment, such as the Endowment at age 85, took the place of Ordinary Life, were requested to furnish the data on such Endowment plan. A few companies found it more convenient to include all plans. The exposed to risk sheets gave both the numbers of policies and the amounts insured.

The extraction of the data from the valuation sheets in groups of ages rather than from the individual applications in accordance with the principles and methods usually governing such investigations, precluded the possibility of investigating the rate of disability by sex, build, occupation, habitat, impairments, etc. While it would have been desirable to study these aspects of the problem, the paucity of the data rendered such an investigation impracticable.

The experience was taken to the end of the year 1924. The companies were requested to report six months later, *i.e.,* July, 1925, all claims for disability which had occurred prior to the 1st of January, 1925, and as the experience of preceding years showed that a delay of more than six months in reporting some claims was to be expected, they were also requested to furnish an estimate of the number and amount of such unreported claims and these were expressed as a percentage of those reported. The estimated "unreported" claims were distributed in certain proportions by years incurred, and further prorated by age groups; the later the claim data were reported to the Committee, the less was the adjustment necessary for "unreported" claims.

The investigation was confined to policies issued on standard lives, *i.e.,* where the normal premium was charged both for the life insurance and for the disability benefits; if the regular premium rate were charged for the life insurance but an increased premium for the disability benefit, the case was omitted from the investigation. Where a company, without evidence of insurability or increase in premium rate, extended retroactively the disability benefits to policies in years in which they were not originally issued, the exposure and the corresponding claims under such policies were excluded from the investigation.

Disability Claims

While the number and amount exposed to risk were furnished on sheets, the data regarding disability claims were furnished on individual policy cards—Hollerith cards of the dual type. A reproduction is given in Appendix B, wherein also are given the Committee's instructions for filling out these cards.

In connection with recoveries, it was decided that if the insured became disabled again from the same cause, the disability should be considered as continuous where the period of recovery was less than six months but that the second disablement should be treated as a new "first disablement" if the period of recovery were six months or more; where the second disablement was due to a different cause it was treated as a new case regardless of the period of recovery.

Since there was considerable diversity in the disability benefits granted by the different companies from time to time, it was considered impracticable to make a separate investigation for each individual type of benefit, and it was therefore determined to include, in one or other of the following classes, policies which, although they did not provide for identical benefits, provided for benefits of the same general type or class. It was therefore required that each case be identified, by code, with one of the following groups:

Code Number	
0	Total and Permanent Disability—Waiver only.
1	Total and Permanent Disability—Instalments, beginning at disability.
2	Total and Permanent Disability—Instalments, beginning in 6 months.
3	Total and Permanent Disability—Instalments, beginning in 12 months or more.
4	Total and Permanent Disability—Annual Income, beginning at disability.
5	Total and Permanent Disability—Annual Income, beginning in 6 months.

Code Number		
6	Total and Permanent Disability	—Annual Income, beginning in 12 months or more.
7	Total and Permanent Disability	—Monthly Income, beginning within one month.
8	Total and Permanent Disability	—Monthly Income, beginning in 6 months.
9	"180 Day Clause"	—Monthly Income, beginning in 6 months.
X0	"90 Day Clause"	—Waiver only.
X7	"90 Day Clause"	—Monthly Income, beginning within one month.
X8	"90 Day Clause"	—Monthly Income, beginning in 6 months.

The necessity of avoiding further sub-division of the data prevented the investigation of the experience in connection with other contract features (see Appendix C).

Grouping of Data From Various Companies

Each company was asked, as the first step in the investigation to submit copies of policies or riders containing disability provisions, accompanied by a statement as to (1) the period during which each was used and (2) the general principles applied to the admission and treatment of claims, both past and present. These statements showed among other things (a) the practice as to "dating back" of claims, (b) the treatment of claims for disability benefits after death of insured, (c) the mode of treatment of cases arising as a result of certain important causes of disability, with a view to informing the Committee as to the practice of each company in acting on new claims, as well as in determining periodically thereafter whether or not the insured was entitled to a continuance of the disability benefits. These statements were subjected to careful analysis in order that the data might be combined into groups as nearly homogeneous as could be determined from *a priori* consideration. As the data in all groups except those defined by codes 7, 8 and X7 related to practically obsolete forms of contract or were so meager as not to merit detailed statistical study, it was decided to limit the investigation of rates of disability and of termination of claims to those three groups. The difficulties and inconsistencies later encountered in the detailed study of the largest groups may be taken as confirmation of the wisdom of the Committee's decision, at this stage, that no results of value could be obtained by attempting to utilize, individually or collectively, the smaller groups of data. Specimen disability clauses for codes 8 and X7 are given in Appendix D.

Unadjusted Data

The experience which the Committee considered worthy of more extended analysis, covered three types of contract, all providing for a monthly income during disability: first, contracts *without* the "90 Day Clause", first payment of monthly income in six months (code 8), second, contracts *without* the "90 Day Clause", first payment of monthly income within one month (code 7), and third, contracts *with* the "90 Day Clause", first payment of monthly income within one month (code X7).

Preliminary investigations were made of the first two classes separately (codes 7 and 8, both *without* the "90 Day Clause") but it was found that there was no systematic difference in the experiences. They were accordingly combined into one class for the purposes of detailed investigation (class (1) below).

On the other hand, a preliminary analysis of the policy forms and practices of the various companies issuing contracts *with* the "90 Day Clause" (code X7) indicated that two substantially different types of experience might be expected and this was confirmed by the actual results obtained. This class was accordingly subdivided into two classes, each of which was considered sufficiently homogeneous to warrant further detailed study.

The three divisions of the combined data, therefore, which were separately analyzed were as follows:

Class (1). All policies providing for monthly income during disability, without the "90 Day Clause" (codes 7 and 8).

Class (2). Policies with the "90 Day Clause", providing for monthly income during disability (part of code X7).

Class (3). Policies with the "90 Day Clause", providing for monthly income during disability (part of code X7).

The unadjusted data for these groups are set forth in Tables 1(a), 2(a) and 3(a) for active lives, and in 1(b), 2(b) and 3(b) for disabled lives, and are compiled throughout on the basis of numbers of policies, not of amounts insured. The experience by amounts which would naturally be somewhat more irregular showed no significant deviation in aggregate results.

TABLE 1(a)

Class (1)—"Active" Lives (Code Nos. 7 and 8)

DATA FOR DETERMINATION OF RATE OF DISABILITY

Ages at Issue	1st Policy Year Exposures	Claims	Unadjusted Rate of Disability per 1000	2nd Policy Year Exposures	Claims	Unadjusted Rate of Disability per 1000
15-24	555,274	292	0.53	374,144	411	1.1
25-34	752,251	361	0.48	535,310	533	1.0
35-44	455,710	235	0.52	336,367	362	1.1
45 and over	148,121	129	0.87	109,211	192	1.8
Total	1,911,356	1,017	0.53	1,355,032	1,498	1.1

Ages at Issue	3rd Policy Year Exposures	Claims	Unadjusted Rate of Disability per 1000	4th Policy Year Exposures	Claims	Unadjusted Rate of Disability per 1000
15-24	262,112	328	1.3	174,353	238	1.4
25-34	386,334	449	1.2	266,201	384	1.4
35-44	246,423	334	1.4	170,490	287	1.7
45 and over	78,163	218	2.8	51,163	124	2.4
Total	973,032	1,329	1.4	662,207	1,033	1.6

Ages at Issue	5th Policy Year Exposures	Claims	Unadjusted Rate of Disability per 1000	6th Policy Year Exposures	Claims	Unadjusted Rate of Disability per 1000
15-24	99,416	163	1.6	37,520	61	1.6
25-34	159,284	215	1.3	64,694	121	1.9
35-44	102,642	172	1.7	44,032	90	2.0
45 and over	29,573	107	3.6	12,433	51	4.1
Total	390,915	657	1.7	158,679	323	2.0

TABLE 1 (b)

CLASS (1)—"DISABLED" LIVES (CODE NOS. 7 AND 8)

DATA FOR DETERMINATION OF RATES OF TERMINATION OF CLAIMS

Ages at Disability	Duration of Disability	Exposures	Recoveries	Deaths	Total Rate of Termination
15–24	1st Quarter	998	5	61	.066
	2nd "	840	23	41	.076
	2nd Half Year	656	38	71	.166
	3rd " "	430	35	27	.144
	4th " "	290	22	23	.155
	5th " "	189	13	13	.138
	6th " "	124	13	5	.145
	7th " "	77	5	3	.104
	8th " "	43	2	2	.094
25–34	1st Quarter	2128	11	101	.052
	2nd "	1816	46	77	.067
	2nd Half Year	1449	86	91	.122
	3rd " "	1018	78	58	.134
	4th " "	692	43	41	.121
	5th " "	460	35	22	.124
	6th " "	295	9	13	.075
	7th " "	184	7	14	.114
	8th " "	93	2	4	.065
35–44	1st Quarter	1695	7	126	.078
	2nd "	1398	21	98	.085
	2nd Half Year	1082	65	119	.170
	3rd " "	681	38	45	.122
	4th " "	440	22	26	.109
	5th " "	290	13	16	.100
	6th " "	188	9	12	.112
	7th " "	98	5	6	.112
	8th " "	44	1	2	.068
45 and over	1st Quarter	1180	8	125	.113
	2nd "	923	14	76	.097
	2nd Half Year	684	19	85	.152
	3rd " "	441	14	46	.136
	4th " "	273	12	25	.136
	5th " "	163	9	6	.093
	6th " "	97	3	1	.041
	7th " "	54	1	5	.112
	8th " "	27	..	2	.074

TABLE 2(a)

CLASS (2)—"ACTIVE" LIVES (PART OF CODE NO. X7)

DATA FOR DETERMINATION OF RATE OF DISABILITY

Ages at Issue	1st POLICY YEAR Exposures	Claims	Unadjusted Rate of Disability per 1000	2nd POLICY YEAR Exposures	Claims	Unadjusted Rate of Disability per 1000
15-24	98,201	173	1.8	43,380	104	2.4
25-34	137,892	217	1.6	65,771	174	2.6
35-44	89,689	130	1.4	45,128	120	2.7
45 and over	32,834	70	2.1	16,150	87	5.4
Total	358,616	590	1.6	170,429	485	2.9

Ages at Issue	3rd POLICY YEAR Exposures	Claims	Unadjusted Rate of Disability per 1000	4th POLICY YEAR Exposures	Claims	Unadjusted Rate of Disability per 1000
15-24	15,338	45	2.9	1,827	6	3.3
25-34	24,237	70	2.9	2,820	3	1.1
35-44	16,724	44	2.6	1,914	3	1.6
45 and over	5,741	40	7.0	664	7	10.5
Total	62,040	199	3.2	7,225	19	2.6

TABLE 2(b)

CLASS (2)—"DISABLED" LIVES (PART OF CODE NO. X7)

DATA FOR DETERMINATION OF RATES OF TERMINATION OF CLAIMS

Ages at Disability	Duration of Disability	Exposures	Recoveries	Deaths	Total Rate of Termination
15–24	1st Quarter	243	46	9	.226
	2nd "	154	32	5	.240
	2nd Half Year	83	23	8	.373
	3rd " "	30	6	1	.233
	4th " "	12	2	1	.250
25–34	1st Quarter	487	57	18	.154
	2nd "	327	54	10	.196
	2nd Half Year	195	52	8	.308
	3rd " "	79	16	3	.241
	4th " "	31	3	2	.162

TABLE 2(b)—Continued

CLASS (2)—"DISABLED" LIVES (PART OF CODE NO. X7)

DATA FOR DETERMINATION OF RATES OF TERMINATION OF CLAIMS

Ages at Disability	Duration of Disability	Exposures	Recoveries	Deaths	Total Rate of Termination
35–44	1st Quarter	350	58	9	.192
	2nd "	238	48	13	.257
	2nd Half Year	134	34	2	.269
	3rd " "	57	24	3	.474
	4th " "	15	2	0	.133
45 and over	1st Quarter	237	26	14	.169
	2nd "	155	20	7	.174
	2nd Half Year	89	19	7	.292
	3rd " "	36	3	5	.222
	4th " "	14	1	0	.071

TABLE 3(a)

CLASS (3)—"ACTIVE" LIVES (PART OF CODE NO. X7)

DATA FOR DETERMINATION OF RATE OF DISABILITY

	1st POLICY YEAR			2nd POLICY YEAR		
Ages at Issue	Exposures	Claims	Unadjusted Rate of Disability per 1000	Exposures	Claims	Unadjusted Rate of Disability per 1000
15-24	188,753	478	2.5	95,630	418	4.4
25-34	235,968	676	2.9	124,614	457	3.7
35-44	163,977	481	2.9	87,872	406	4.6
45 and over	64,964	307	4.7	34,624	256	7.4
Total	653,662	1,942	3.0	342,740	1,537	4.5

	3rd POLICY YEAR			4th POLICY YEAR		
Ages at Issue	Exposures	Claims	Unadjusted Rate of Disability per 1000	Exposures	Claims	Unadjusted Rate of Disability per 1000
15-24	38,614	155	4.0	8,014	36	4.5
25-34	51,744	249	4.8	10,696	34	3.2
35-44	36,219	211	5.8	7,490	48	6.4
45 and over	14,273	109	7.6	2,944	24	8.2
Total	140,850	724	5.1	29,144	142	4.9

TABLE 3(b)

CLASS (3)—"DISABLED" LIVES (PART OF CODE NO. X7)

DATA FOR DETERMINATION OF RATES OF TERMINATION OF CLAIMS

Ages at Disability	Duration of Disability	Exposures	Recoveries	Deaths	Total Rate of Termination
15–24	1st Quarter	825	244	10	.308
	2nd "	479	92	15	.223
	2nd Half Year	282	69	26	.337
	3rd " "	108	23	8	.287
	4th " "	41	2	2	.098
	5th " "	18	..	1	.056
	6th " "	7	..	1	.143
5–34	1st Quarter	1,326	318	20	.255
	2nd "	831	145	32	.213
	2nd Half Year	492	119	21	.285
	3rd " "	200	13	10	.115
	4th " "	90	7	3	.111
	5th " "	40	1	3	.100
	6th " "	17	..	1	.059
	1st Quarter	1,074	275	22	.276
	2nd "	636	106	32	.217
	2nd Half Year	367	71	33	.283
	3rd " "	162	17	5	.136
	4th " "	83	4	9	.156
	5th " "	35	2	2	.114
	6th " "	9	..	1	.111
	1st Quarter	768	148	29	.231
	2nd "	499	82	34	.232
	2nd Half Year	284	43	33	.267
	3rd " "	115	5	7	.104
	4th " "	62	3	1	.064
	5th " "	27	..	..	...
	6th " "	8	..	..	...

SECTION B

Graduation

(The graduation of the rates of disability and of the disabled lives mortality and recovery tables is the work of Mr. Robert Henderson)

There are two elements of the experience which enter into the mathematical calculation of the net premium for the disability benefit on life insurance policies, namely:

(1) The rate of disability among active lives, and

(2) The rate of discontinuance of disability claims, i.e., deaths plus recoveries among disabled lives.

1(a). *Graduation of Rates of Disability, Class (1).*

For Class (1) the rates of disability during the earlier policy years were substantially lower than those during the later years, the experience being confined to the first six policy years. The increases in the rates of disability with duration were fairly rapid in the early policy years but much less rapid later on. Whether this rapid increase was due solely to initial selection wearing off, or in part to the companies becoming more liberal in allowing disability claims was uncertain.

Owing to the limited duration and the nature of the experience it was impossible to determine what the ultimate disability rate in this class of business would be.

In order to get some possible light on this subject, for some assumptions had to be made as to the ultimate rate of disability to enable net premiums and reserves to be calculated, the experiences of two large companies, which contributed their experience to the joint investigation, were ascertained separately by the companies in question.

The experience of the first of these companies indicated that the rates of disability, instead of progressively increasing with duration, reached a maximum before the 6th policy year and then decreased, while that of the other company, which used the actual date of commencement of disability, instead of the date of commencement of benefit which the Committee used, showed that the maximum relative rate of disability was in the second policy year, the relative rate decreasing slightly but steadily each policy year thereafter up to the sixth year, which was the last year available. Therefore, although the Committee's data as a whole did not clearly indicate any such maximum in the early policy years, it appeared hardly proper to assume that the experience of the sixth policy year would represent the ultimate disability rate. The Committee, therefore, prepared rates of disability on two different assumptions—the first that the disability rate to be used in the calculation of premiums was that based on the experience of the 6th policy year only, and the second that such rate of disability was that deduced from the experience of the 4th, 5th and 6th policy years combined.

The Committee desires to call attention to the fact that while the resulting tables enable premiums to be calculated for various entry ages, there is no actual experience indicating the rates of disability in any case beyond the 6th policy year. It follows that if the relative decline in the disability rates after the first few policy years of insurance observed by the two companies in question does constitute a permanent feature of the business, premiums deduced from the disability rates of the 6th policy year or perhaps even of the 4th, 5th and 6th years combined, will be too high. On the other hand, there has been some tendency for the experienced rate of disability to grow from calendar year to calendar year, and it is quite possible that in the future still higher disability rates according to age and duration of policy may be found to prevail. The premium rates given, based on this experience, must, therefore, be understood merely as indicating what such experience, if persistent, would require in the way of premiums, and not in any sense as expressing the Committee's view as to the probable cost of disability under contracts now being issued.

Regarding the first assumption, the rates of disability based on the experience of the 6th policy year were found to be fitted fairly closely by a constant addition to the rates of disability p_x^{ai} according to Hunter's Table. The constant addition was 1.162 per 1000. The following table shows the data and the rates of disability based on the experience of the 6th policy year:

TABLE 4

CLASS (1)
(SIXTH POLICY YEAR)

Ages at Issue	Exposed	Claims	Crude Rate per 1000	Adjusted Rate per 1000	Expected Claims	Deviation
15-24	37,520	61	1.63	1.687	63.3	+ 2.3
25-34	64,694	121	1.87	1.791	115.9	— 5.1
35-44	44,032	90	2.04	2.243	98.8	+ 8.8
45 and over	12,433	51	4.10	3.631	45.1	— 5.9
Total	158,679	323			323.1	

Under the second assumption, where the rates of disability were based on the experience of the 4th, 5th and 6th policy years combined, the rates of disability per 1000 were obtained from the formula $1.150\, p_x^{ai} + 1.2032 - .0135x$ where p_x^{ai} is taken from Hunter's table. The following table shows a comparison of the expected claims according to this graduation with the actual:

TABLE 5

CLASS (1)
(AGGREGATE OF 4TH, 5TH AND 6TH POLICY YEARS)

Ages at Issue	Equivalent Attained Age	Exposed	Claims	Crude Rate per 1000	Adjusted Rate per 1000	Expected Claims	Deviation
15-24	23.8	311,289	462	1.48	1.487	462.9	+ .9
25-34	33.4	490,179	720	1.47	1.452	711.6	— 8.4
35-44	43.0	317,164	549	1.73	1.776	563.3	+14.3
45 and over	52.6	93,169	282	3.03	2.956	275.4	— 6.6
Total		1,211,801	2,013			2,013.2	

1(b). *Graduation of Rate of Disability, Classes (2) and (3).*

In deriving the rates of disability for Classes (2) and (3) it was considered desirable, owing to the similarity of the benefits, to treat the two classes to a certain extent together in order that the irregularities might have a chance to neutralize one another. It was also found in each class that while the rates of disability for the first policy year were very much lower than those of subsequent years the increase after the second year was inappreciable. It was accordingly decided to omit the first policy year and prepare an aggregate table on the basis of the combined experience of the 2nd, 3rd and 4th policy years. The rates of disability for the four different age groups at entry were accordingly constructed for the two classes combined giving rates of disability at four different equivalent ages. These four rates were used to determine the constants in the formula $r_x = A - Hx + Bc^x$.

The values so derived were:

$$\begin{aligned} A &= .005608 \\ H &= .0001212 \\ Log\ B &= \bar{4}.1685 \\ Log\ c &= .034 \end{aligned}$$

It will be noticed that the formula has four constants and that they could therefore be determined so as to reproduce exactly the rates for the four ages. The constants "B" and "c" of this formula were then taken as common to both classes and the other two constants determined for each class separately in order to reproduce the total number of claims and the average age at disability. The following table gives the data used in determining the rates of disability for Class (2).

TABLE 6

Class (2)

(Aggregate of 2nd, 3rd and 4th Policy Years)

Ages at Issue	Equivalent Attained Age	Exposed	Claims	Crude Rate per 1000	Adjusted Rate per 1000	Expected Claims	Deviation
15-24	22.0	60,545	155	2.56	2.728	165.2	+10.2
25-34	31.4	92,828	247	2.66	2.370	220.0	—27.0
35-44	40.8	63,766	167	2.62	2.986	190.4	+23.4
45 and over	50.2	22,555	134	5.94	5.641	127.2	— 6.8
Total		239,694	703			702.8	

The values of the constants used in determining the above adjusted rates were:

$$\begin{aligned} A &= .0048445 \\ H &= .0001337 \end{aligned}$$

The following table gives the data for determining the rates of disability in Class (3):

TABLE 7

CLASS (3)
(AGGREGATE OF 2ND, 3RD AND 4TH POLICY YEARS)

Ages at Issue	Equivalent Attained Age	Exposed	Claims	Crude Rate per 1000	Adjusted Rate per 1000	Expected Claims	Deviation
15-24	22.0	142,258	609	4.28	4.244	603.7	— 5.3
25-34	31.4	187,054	740	3.96	4.066	760.6	+20.6
35-44	40.8	131,581	665	5.05	4.863	639.9	—25.1
45 and over	50.2	51,841	389	7.50	7.697	399.0	+10.0
Total		512,734	2,403			2,403.2	

The values of the constants used in determining the adjusted rates were:

$$A = .0059376$$
$$H = .0001145$$

The following table shows the adjusted rates of disability for quinquennial ages for the various classes:

TABLE 8

ADJUSTED RATES OF DISABILITY
PER 1000

Age	Hunter (p_x^{ai})	Class (1) 6th Yr.	Class (1) Aggregate 4th, 5th & 6th Yrs.	Class (2) Aggregate 2nd, 3rd & 4th Yrs.	Class (3) Aggregate 2nd, 3rd & 4th Yrs.
20	.515	1.68	1.53	2.88	4.35
25	.528	1.69	1.47	2.55	4.12
30	.561	1.72	1.44	2.38	4.05
35	.642	1.80	1.47	2.45	4.21
40	.832	1.99	1.62	2.87	4.73
45	1.151	2.31	1.92	3.82	5.78
50	1.696	2.86	2.48	5.55	7.60
55	2.752	3.91	3.63	8.42	10.57
59	4.643	5.81	5.75	11.90	14.13

2. *Duration of Claims—Value of Annuity during Disability.*

With regard to the rates of discontinuance of claims, *i.e.* termination of disability, it was considered that, owing to the rapid change in the rate of discontinuance with duration in the early disability years, combined with the very high proportion of existing, careful study should be given to the treatment of the existing in the determination of the exposed to risk. A tabulation, in each of the three classes, was accordingly made for all ages combined showing for each month of duration of disability the existing, taken to the nearest month, and the recovered and dead, tabulated according to current month of duration. The exposed to risk for each month was then made up in the usual way, and, from the resulting monthly rates of termination, a continuance table showing the proportion remaining alive and disabled at the end of each month. From the probabilities of discontinuance derived from this table it was seen to be safe to group the data for the first three months of duration, and also for the second quarter, and for each half year thereafter, provided the existing for one to three months duration were treated as exposed on an average for two-thirds of the first quarter, those for four to six months duration for two-thirds of the second quarter, and those for durations seven to twelve months inclusive, for seven-twelfths of the second half year and similarly for the subsequent half years. The rates of discontinuance were, in practically every case, slightly below those derived by compounding the monthly rates. This method of grouping was accordingly applied to the data for the different groups of ages at disability.

Class (1). In this class an appreciable amount of data was available for the first four years of duration. A summary of the data for the various age groups is shown in Table 1(b). Owing to the fact that the data furnished no information beyond four years of duration it was necessary to make some assumption regarding the subsequent rates of discontinuance. It was decided to assume that they ultimately ran into those shown for the attained age in the 10th year of Hunter's Analyzed Disabled Life Table (T. A. S. A. XII, 51-52), and to grade the joint experience rates smoothly into this ultimate. This result would be accomplished by assuming that the claims might be divided into two parts, one part being subject to a rate of termination equal to the rate of mortality shown in the 10th year of Hunter's Analyzed Disabled Life Table and the other part being subject to a relatively high constant rate of termination so that the survivors would in a few years become negligible compared with those in the first part.

A preliminary calculation was first made of the proportion in each age group that should be assumed to follow Hunter's Ultimate Disabled Life Table in order that the rate of termination of the balance should be as nearly as possible uniform over the four disability years of actual experience. The resulting proportions for the four groups of ages at disability, 15-24, 25-34, 35-44 and 45 and over, were .146, .170, .343 and .393 respectively. For this somewhat irregular series was substituted one varying uniformly with the age, the values corresponding to the mean ages of the respective groups being .1263, .1984, .3014 and .4147, the formula for the proportion at age x being $.0103x - .1003$. On the basis of this division the mean termination rate in the supplementary series for each age group was next determined. These rates were assumed to be those for the mean age of the group and the rates for quinquennial ages from 20 to 60 inclusive, were determined for them by the formula

$$Colog\ p''_{[x]} = A + H\,(x\text{-}20) + Bc^{x-20}$$

The constants were: $A = .02691$; $H = .010208$; $B = .18322$ and $Log\ c = \bar{1}.90352$. On this basis annuity values were calculated for quinquennial ages and the intermediate values interpolated. The following are the monthly annuity values so calculated at 3% and at 3½% respectively, for the mean ages of each group compared with similar values on the basis of Hunter's Aggregate Disabled Life Table:

TABLE 9

Claim Value Monthly Annuity—Class (1)

	3%			3½%		
Age Group	Experience	Hunter's	Ratio	Experience	Hunter's	Ratio
15-24	4.218	5.688	.742	4.099	5.506	.744
25-34	5.417	7.733	.701	5.208	7.440	.700
35-44	5.582	8.117	.688	5.351	7.830	.683
45 and over	5.380	7.342	.733	5.170	7.111	.727
Average	5.264	7.435	.708	5.063	7.174	.706

As a test of the closeness of fit with the original data the values of $|_4e_x$ were calculated with the following result:

TABLE 10

Age Group	Adjusted	Original
15-24	1.943	1.936
25-34	2.247	2.244
35-44	2.035	2.046
45 and over	2.009	1.989

Class (2). In this class only two years' termination rates could be obtained from the data, the data for the third claim year being negligible. The same principle as in Class (1) was applied to the graduation of the termination rates of these two years, except that owing to the irregularity of the data it was assumed that *Log c* = $\bar{1}.9$ which is approximately the value found in Class (1). Having found in this way first and second year termination rates for quinquennial ages at disability, these rates were extended by assuming a supplementary geometrical series added to the survivors calculated for Class (1). The proportions of the two series and the termination rate in the supplementary series were determined for each age so as to reproduce the first and second year rates of termination. The following table gives the annuity values on this basis for the average age of each group compared with Hunter's values:

TABLE 11

CLAIM VALUE MONTHLY ANNUITY—CLASS (2)

Age Group	3% Experience	3% Hunter's	3% Ratio	3½% Experience	3½% Hunter's	3½% Ratio
15-24	1.962	5.688	.345	1.913	5.506	.347
25-34	2.403	7.733	.311	2.326	7.440	.313
35-44	2.905	8.117	.358	2.802	7.830	.358
45 and over	2.956	7:342	.403	2.858	7.111	.402
Average	2.584	7.435	.348	2.500	7.174	.348

The values of $|_2e_x$ for the different age groups on this basis compared with the original are as follows:

TABLE 12

Age Group	Adjusted	Original
15-24	.609	.580
25-34	.697	.771
35-44	.739	.640
45 and over	.769	.837

Class (3). In this class the experience in the third claim year was so small that it was discarded, but the data for the first two claim years, being more extensive, were used in deriving termination rates, and the same method was applied to the adjustment of the termination rates of these two years as was used for Class (2). The second year termination rates were, however, so close to those of Class (1) that it was assumed that those of the third and subsequent years were the same as for that class. The method already described of calculating annuity values for quinquennial ages and interpolating for other ages was used in this class also. The following table gives the annuity values on this basis for the average age of each age group compared with Hunter's values:

TABLE 13

CLAIM VALUE MONTHLY ANNUITY—CLASS (3)

Age Group	3%			3½%		
	Experience	Hunter's	Ratio	Experience	Hunter's	Ratio
15-24	2.237	5.688	.393	2.160	5.506	.392
25-34	2.874	7.733	.372	2.766	7.440	.372
35-44	3.495	8.117	.431	3.356	7.830	.429
45 and over	3.756	7.342	.512	3.623	7.111	.509
Average	3.122	7.435	.420	3.006	7.174	.419

The values of $|_{x}e_x$ for the different age groups on this basis compared with the original are as follows:

TABLE 14

Age Group	Adjusted	Original
15-24	.616	.587
25-34	.702	.749
35-44	.739	.702
45 and over	.783	.796

The following is a summary of the claim values thus derived, for quinquennial ages last birthday at disability:

TABLE 15(a)

Claim Value Monthly Annuity—3%

Completed Age at Disability	Hunter	Class 1	Class 2	Class 3
20 + 1/2	5.19	3.61	1.87	2.05
25	6.83	5.07	2.20	2.60
30	7.96	5.47	2.48	2.97
35	8.17	5.55	2.74	3.28
40	8.05	5.59	2.96	3.58
45	7.72	5.56	3.04	3.76
50	7.30	5.35	2.94	3.74
55	6.84	5.03	2.77	3.57
59	6.58	4.84	2.61	3.45

TABLE 15(b)

Claim Value Monthly Annuity—3½%

Completed Age at Disability	Hunter	Class 1	Class 2	Class 3
20 + 1/2	5.04	3.50	1.78	1.98
25	6.59	4.91	2.15	2.51
30	7.67	5.25	2.40	2.86
35	7.88	5.32	2.65	3.14
40	7.77	5.36	2.86	3.44
45	7.47	5.34	2.94	3.62
50	7.07	5.14	2.85	3.61
55	6.64	4.86	2.69	3.46
59	6.39	4.70	2.55	3.35

To facilitate the calculation of other annuity values than those above tabulated, tables of *Log* $l_{[x]+n}$ (Table 16) and $q_{[x]+n}$, total termination rate (Table 17), are furnished. These values have been modified so as to merge definitely into the ultimate table at the end of ten years without altering the annuity values in the early years.

TABLE 16

VALUES OF $Log\ l^{i}_{[x]+n}$

Duration from Disablement

Age at Disablement		0	1	2	3	4	5	6	7	8	9	10 and over	Attained Age
20	(1)	6.57224	6.38621	6.21102	6.05030	5.90784	5.78606	5.68757	5.60138	5.52716	5.47262	5.44586	30
	(2)	6.92779	6.48812	6.23377	6.05487	5.90870						5.43531	31
	(3)	6.83964										5.42476	32
												5.41421	33
												5.40366	34
25	(1)	6.26729	6.15100	6.04046	5.93700	5.84162	5.74816	5.65536	5.56598	5.48293	5.42237	5.39311	35
	(2)	6.73816	6.35997	6.11683	5.96175	5.84908						5.38256	36
	(3)	6.59930	6.18895									5.37156	37
												5.36056	38
												5.34912	39
30	(1)	6.10196	5.98579	5.87829	5.78049	5.69154	5.61112	5.53545	5.46542	5.40556	5.36104	5.33768	40
	(2)	6.54784	6.19520	5.96100	5.80956	5.70051						5.32624	41
	(3)	6.40214	6.01304									5.31480	42
												5.30336	43
												5.29147	44
35	(1)	5.96967	5.83619	5.71856	5.61827	5.53531	5.46849	5.41456	5.36691	5.32745	5.29768	5.27958	45
	(2)	6.35990	6.01915	5.79103	5.64370	5.54350						5.26769	46
	(3)	6.22177	5.83836									5.25580	47
												5.24347	48
												5.23069	49
40	(1)	5.84189	5.69064	5.56686	5.47075	5.39889	5.34653	5.30839	5.27916	5.25402	5.23338	5.21746	50
	(2)	6.18948	5.85689	5.63369	5.49420	5.40636						5.20378	51
	(3)	6.05389										5.18921	52
												5.17374	53
												5.15646	54
45	(1)	5.71888	5.55485	5.43236	5.34674	5.28895	5.24950	5.22107	5.19838	5.17785	5.15750	5.13692	55
	(2)	6.04844	5.72219	5.50300	5.37237	5.29729						5.11510	56
	(3)	5.90174										5.09145	57
												5.06642	58
												5.04047	59
50	(1)	5.59956	5.42788	5.31109	5.23655	5.18784	5.15234	5.12265	5.09508	5.06807	5.04089	5.01360	60
	(2)	5.93547	5.61623	5.39824	5.27085	5.19991						4.98580	61
	(3)	5.76525										4.95661	62
												4.92556	63
												4.89264	64
55	(1)	5.46830	5.29027	5.17656	5.10570	5.05811	5.02139	4.98922	4.96810	4.92619	4.89280	4.85784	65
	(2)	5.81445	5.49719	5.27798	5.14815	5.07388						4.82116	66
	(3)	5.62767										4.78258	67
												4.74257	68
												4.70113	69
60	(1)	5.29952	5.12079	5.01470	4.94940	4.90224	4.86168	4.82270	4.78320	4.74282	4.70120	4.65826	70
	(2)	5.67708	5.36369	5.14246	5.00670	4.92532						4.61443	71
	(3)	5.45723										4.56964	72
												4.52436	73
												4.47812	74
												4.43091	75
												4.38225	76
												4.33164	77
												4.27858	78
												4.22207	79
												4.16059	80

NOTE:

1. Figures on lines marked (1) pertain to Class (1)
   " " " " (2) " " " (2)
   " " " " (3) " " " (3)
2. Where no figures are shown for Class (2) or (3), the corresponding figures for Class (1) are to be used.

TABLE 17

VALUES OF $q^{t}_{[x]+n}$ RATE OF TERMINATION

Duration from Disablement

Age at Disablement		0	1	2	3	4	5	6	7	8	9	10 and over	Attained Age
20	Class (1)	.348	.332	.309	.280	.245	.203	.180	.157	.118	.060	.024	30
	(2)	.637	.443	.338	.286	.246						.024	31
	(3)	.648										.024	32
												.024	33
												.024	34
25	Class (1)	.235	.225	.212	.197	.194	.192	.186	.174	.130	.065	.024	35
	(2)	.581	.429	.300	.229	.207						.025	36
	(3)	.611	.290									.025	37
												.026	38
												.026	39
30	Class (1)	.235	.219	.202	.185	.169	.160	.149	.129	.097	.052	.026	40
	(2)	.556	.417	.294	.222	.186						.026	41
	(3)	.592	.267									.026	42
												.027	43
												.027	44
35	Class (1)	.265	.237	.206	.174	.143	.117	.104	.087	.066	.041	.027	45
	(2)	.544	.409	.288	.206	.159						.027	46
	(3)	.586	.241									.028	47
												.029	48
												.030	49
40	Class (1)	.294	.248	.199	.152	.114	.084	.065	.056	.046	.036	.031	50
	(2)	.535	.402	.275	.183	.129						.033	51
	(3)	.567										.035	52
												.039	53
												.044	54
45	Class (1)	.315	.246	.179	.125	.087	.063	.051	.046	.046	.046	.049	55
	(2)	.528	.396	.260	.159	.104						.053	56
	(3)	.550										.056	57
												.058	58
												.060	59
50	Class (1)	.327	.236	.158	.106	.078	.066	.062	.060	.061	.061	.062	60
	(2)	.521	.395	.254	.151	.104						.065	61
	(3)	.540										.069	62
												.073	63
												.077	64
55	Class (1)	.336	.230	.151	.104	.081	.071	.067	.071	.074	.077	.081	65
	(2)	.518	.396	.258	.157	.114						.085	66
	(3)	.540										.088	67
												.091	68
												.094	69
60	Class (1)	.337	.217	.140	.103	.089	.086	.087	.089	.091	.094	.096	70
	(2)	.514	.399	.268	.171	.136						.098	71
	(3)	.539										.099	72
												.101	73
												.103	74
												.106	75
												.110	76
												.115	77
												.122	78
												.132	79

Where no rates of termination are shown, those for Class (1) are to be used

Claim Reserves

The average claim annuity values at date of disability (Tables 15(a) and 15(b)) indicate that the corresponding reserves for claims required to be set up on the basis of Hunter's Disabled Life Table are higher than are really required. In order to further test this question a calculation was made of the average value of claims after one year of disability and also after two years of disability with the following result:

TABLE 18

Average Value of Claims—3% Basis

Duration Years	Hunter	Class (1)	Class (2)	Class (3)	Ratio to Hunter Class (1)	Class (2)	Class (3)
0	7.435	5.264	2.584	3.122	.71	.35	.42
1	7.520	6.266	4.350	6.280	.83	.58	.84
2	7.581	7.282	6.258	7.282	.96	.83	.96

It must be remembered, however, that the claim annuity values set forth in Tables 15(a) and 15(b) were based on rates of termination after disability determined only in part from the joint experience and that it was necessary, for later disability years, to supplement this joint experience by hypothetical rates of termination based on rates from Hunter's Analyzed Disabled Life Table as hereinbefore explained.

The terminal reserves given in Table 18 would indicate, as a safe approximate basis of valuation for claims, the following percentages of the Hunter mean reserves:

TABLE 19

	Percentage of Hunter Class 1	Class 2	Class 3
Unreported claims	70%	35%	40%
First Year Average.......	80	50	65
Second Year Average	100	85	100
Thereafter	100	100	100

For long durations the true reserve on the hypothesis adopted would exceed 100% of Hunter's Table, but for the earlier years the values are slightly overstated above so that taking account of the relatively small numbers at the long durations the suggested rule would give, on the whole, conservative results until further investigation can be made of the experience.

Net Annual Premiums, Ordinary Life Plan

The following are the net annual premiums on the basis of preceding rates of disability and claim values for the various benefits indicated. These premiums are for benefits payable during disability provided it commences before age 60 and the net premium waived, where waiver is indicated, is the net Ordinary Life premium on the *American Experience* Table with the respective rates of interest stated below, although the net annual premium for the disability benefit on the 3½% basis is calculated by the *American Men Ultimate* Table.

TABLE 20

Class (1) 6th Year Disability Rates
Net Annual Premium for Benefit

	American 3%			American Men Ultimate, 3½%		
Age	$1 per Annum	$10 per Month	Same Plus Waiver of Net Premium	$1 per Annum	$10 per Month *	Same Plus Waiver of Net Premium *
20	$.010815	$1.30	$1.46	$.010336	$1.24	$1.38
25	.011873	1.42	1.61	.011337	1.36	1.53
30	.012797	1.54	1.77	.012214	1.47	1.68
35	.013924	1.67	1.96	.013302	1.60	1.86
40	.015382	1.85	2.23	.014715	1.77	2.12
45	.017212	2.07	2.58	.016498	1.98	2.45
50	.019674	2.36	3.08	.018911	2.27	2.93
55	.023427	2.81	3.88	.022608	2.71	3.71

TABLE 21

Class (1) Aggregate Disability Rates (4th, 5th & 6th Yrs.)
Net Annual Premium for Benefit

	American 3%			American Men Ultimate, 3½%		
Age	$1 per Annum	$10 per Month	Same plus Waiver of Net Premium	$1 per Annum	$10 per Month	Same plus Waiver of Net Premium
20	$.009308	$1.12	$1.25	$.008893	$1.07	$1.19
25	.010153	1.22	1.38	.009689	1.16	1.31
30	.010939	1.31	1.51	.010435	1.25	1.43
35	.012003	1.44	1.69	.011459	1.38	1.61
40	.013478	1.62	1.95	.012886	1.55	1.85
45	.015440	1.85	2.31	.014791	1.77	2.19
50	.018182	2.18	2.84	.017473	2.10	2.71
55	.022448	2.69	3.71	.021661	2.60	3.56

* Note—If the American 3½% table be substituted for the American Men Ultimate 3½% table, the annual premiums will be reduced by two cents at the youngest ages, and one cent at the middle ages, while those for the highest age will not be affected.

TABLE 22

Class (2) Aggregate Disability Rates (2nd, 3rd & 4th Yrs.) Net Annual Premium for Benefit

	American 8%			American Men Ultimate, 3½%		
Age	\$1 per Annum	\$10 per Month	Same plus Waiver of Net Premium	\$1 per Annum	\$10 per Month	Same plus Waiver of Net Premium
20	\$.008948	\$1.07	\$1.20	\$.008576	\$1.03	\$1.15
25	.009979	1.20	1.36	.009560	1.15	1.29
30	.011341	1.36	1.57	.010867	1.30	1.49
35	.013189	1.58	1.86	.012654	1.52	1.77
40	.015618	1.87	2.26	.015015	1.80	2.15
45	.018692	2.24	2.79	.018020	2.16	2.67
50	.022498	2.70	3.52	.021767	2.61	3.37
55	.027173	3.26	4.50	.026390	3.17	4.33

TABLE 23

Class (3) Aggregate Disability Rates (2nd, 3rd & 4th Yrs.) Net Annual Premium for Benefit

	American 3%			American Men Ultimate, 8½%		
Age	\$1 per Annum	\$10 per Month	Same plus Waiver of Net Premium	\$1 per Annum	\$10 per Month	Same plus Waiver of Net Premium
20	\$.016557	\$1.99	\$2.23	\$.015791	\$1.90	\$2.11
25	.018574	2.23	2.53	.017722	2.13	2.40
30	.020914	2.51	2.89	.019968	2.40	2.74
35	.023845	2.86	3.36	.022792	2.74	3.19
40	.027526	3.30	3.98	.026359	3.16	3.78
45	.032003	3.84	4.79	.030722	3.69	4.56
50	.037349	4.48	5.84	.035957	4.32	5.58
55	.043857	5.26	7.26	.042346	5.08	6.95

Comparison of Classes (1) and (2)

It will be observed that the apparent cost of disability at the younger ages is greater in Class (1) without the "three months clause" than in Class (2) which covers policies with this clause. Two causes appear to have been at work to produce this difference. In the first place, the experience in Class (1) is that of the 4th, 5th and 6th years (or of the 6th year alone) while the experience in Class (2), except for a very small amount in the 4th policy year, is that of the 2nd and 3rd policy years. In Class (1) the rates of disability were higher in the 4th, 5th and 6th years than in the 2nd and 3rd, and it is possible that this condition will also, in due course, be found to exist in the Class (2) business.

The other cause of difference lies in the very low relative cost of claims shown in Class (2). It will be observed that the cost is even lower than in Class (3) where it would have been natural to expect that there was a larger proportion of temporary claims than in Class (2). Possible reasons for this are discussed below. It is also possible that the experience in Class (2) of mortality and recovery among disabled lives has been affected by an accidental fluctuation reducing the apparent cost of claims. There can be no question that under equal conditions the cost in Class (2) will be higher than in Class (1).

The above situation aptly illustrates the difficulties experienced by the Committee in attempting to produce premiums for disability benefits with so short an available experience.

Comparison of Classes (2) and (3)

It will be noted that Classes (2) and (3) represent experiences under the same general type of benefit and policy conditions and differ only in the administration of the business.

There are at least four points on which the administration of the business by different companies may differ:

(1) In issuing a policy with the disability benefits, the question as to whether an individual is a good risk for disability benefits — where he may be a good insurance risk — may or may not have been taken into account;

(2) In passing upon disability claims, strictness in exacting proof and in interpreting the terms of the contract may or may not be exercised in considering the claim;

(3) When a disability claim is admitted, the question as to whether or not payments shall be made for any period prior to the filing of proofs where such filing has been delayed is of importance. The actuarial assumption is that such back payments have been provided for in the premium but the policies generally do not provide for the payment of such arrears; and

(4) The care exercised, after a disability claim has been admitted, in procuring evidence of continued disability before continuing payment of the benefits; this is of vital importance in connection with the cost of the benefit.

The actions of the companies contributing their experiences to Classes (2) and (3) probably differed in at least some of these respects, although on the basis of information furnished to the Committee the existence of any systematic difference on the third point is doubtful.

The question may be raised, therefore, as to whether Class (2) or (3), if either, should be taken as a guide.

In this connection, it may be pointed out that the experience in either class can be taken only as a rough indication of what may be expected, because (i) the numbers involved are small, (ii) each experience is of short duration, and (iii) the assumptions made in supplementing the short experience may or may not be appropriate.

A comparison of the results under Classes (2) and (3) indicates that the cost of the same benefit may differ greatly in two companies as a result of different methods of underwriting and treatment of disability claims.

These differences in premium show how imperative it is for any company contemplating the use of these tables, to investigate closely its own disability experience and to consider carefully its own methods of disability underwriting, of passing upon disability claims and of periodically checking up the continuance, or otherwise, of disability.

Relative Usefulness of Data in Classes (1), (2) and (3)

The experience under Class (1), while larger than under Classes (2) and (3), cannot, for reasons already stated, be regarded as a completely satisfactory basis for premiums, although it may assist the actuary in forming an opinion as to the basis on which premium rates should be calculated. The results under Classes (2) and (3) are even less satisfactory as the experience is still in the "select" period and the data of the two classes exhibited divergences not easily explained. It has been suggested that in order to determine premiums for the three months' clause the wisest plan would be to determine the rate for the Class (1) benefit and add thereto such additional premium as the added provision was considered to require.

Reserves on "Active" Lives

As the Committee has already stated, tables of net premiums have been presented with great reluctance because of the short period of time during which disability provisions of the present type have been in use. The Committee feels, for the reasons stated, even more hesitation in making use of the meagre data to arrive at reserves for active lives, and has therefore determined neither to calculate nor to publish any tables of such reserves. It feels that more time must elapse before sufficient data can be accumulated to justify the calculation of such reserves, and, until such data are available, no good purpose can be served by changing the reserve basis now generally used —namely, Hunter's Disability Table, interest at 3% or 3½%.

SECTION C

Causes of Disability

It was not deemed necessary to analyze the causes of disability for each of the above groups separately, but the following three characteristic types, which differ in constitution from classes (1), (2) and (3) above, were selected for investigation:

(a) Policies providing for waiver of premium only;

(b) Policies providing for both waiver of premium and monthly income beginning at once, with the presumption of permanent disability after ninety days; and

(c) Policies providing for both waiver of premium and monthly income beginning at once without the "90 days clause", but with a treatment of disability claims reported as "strict" by the contributing companies.

The number of disability cases under (a), (b) and (c) were 4,773, 5,292 and 1,553 respectively. The percentages of disability claims arising from each of the fourteen principal causes of disability for all ages combined are given in the following table:

TABLE 24

Cause of Disability

Percentage of Disabled by Cause to Total Disabled

Cause	Waiver of Premium Only (a)	W. of P. and Monthly Income With 90 Day Clause (b)	W. of P. and Monthly Income Without 90 Day Clause "Strict" (c)	
1. Tuberculosis of lungs	37%	19%	37%	
2. Insanity, melancholia, paresis and neurasthenia	20	5	11	
3. Accidents	4	18	4	
4. Cancer and other malignant tumors	4	3	7	
5. Neuralgia, neuritis and other non-cerebral diseases of the nervous system excluding mental alienation	2	8	3	
6. Heart disease	3	2	2	
7. Spinal diseases including locomotor ataxia	3	1	3	
8. Tuberculosis, except of lungs	2	1	2	
9. Bright's disease	2	1	2	
10. Appendicitis	..	5	..	
11. Rheumatism	1	4	..	
12. Diseases of bones and organs of locomotion	1	3	..	
13. Paralysis	5	..	1	
14. Anemia and Chlorosis	1	1	1	
15. Other causes	15	29	27	33
	100	100	100	
Approximate average period—date of issue to date of disability	6 years	1½ years	3 years	

There is in general a similarity between types (a) and (c), but a marked difference between these groups and (b). For example, the proportion of claims from accidents, from non-cerebral diseases of the nervous system, and from appendicitis (lines 3, 5 and 10) would naturally be greater under clauses where ninety days of continuous total disability entitled the policy-holders to these benefits than under clauses where they were not so entitled.

In contrasting the above percentages with each other it should be remembered that the average period of exposure differs in the three groups and in considering the results with regard to future experience, it should not be overlooked that the average period of exposure was brief. The approximate average periods from date of issue to disablement are stated in Table 24 as 6 years, 1½ years and 3 years, respectively. It is to be expected that acute diseases and those of early life would appear as the causes of proportionately more claims under an experience of short average duration and consequently low average age, whereas in an experience of long average duration with higher average age, the degenerative diseases which more particularly affect old age will produce proportionately more disability claims.

Causes of Death Among Disabled Lives

The deaths among the disabled lives were classified according to causes of death and the results, shown as percentages of the total deaths, are found in the following table for each type separately:

TABLE 25

Cause of Death—Disabled Lives
Percentage of Deaths by Cause to Total Deaths
All Ages Combined

Cause	Waiver of Premium Only (a)	W. of P. and Monthly Income With 90 Day Clause (b)	W. of P. and Monthly Income Without 90 Day Clause "Strict" (c)
1. Tuberculosis of lungs	37%	34%	32%
2. Cancer and other malignant tumors	9	23	20
3. Insanity, melancholia and paresis	11	2	4
4. Bright's Disease	4	4	5
5. Heart Disease	4	6	5
6. Cerebral hemorrhage and apoplexy	5	1	3
7. Tuberculosis, except of lungs	2	4	1
8. Anemia and Chlorosis	3	1	2
9. Suicide	1	2	1
10. Other causes	24	23	27
	100	100	100
Number of deaths	1,835	456	441
Number of disabled lives	4,773	5,292	1,553
Ratio—Deaths to Disabled	38.5%	8.6%	28.4%
Approximate Average Period—date of disability to date of death	18 mos.	8 mos.	12 mos.

The difference in the percentage of deaths from the various causes is occasionally difficult to explain. For example, we would expect a larger proportion of deaths from cancer among the older group of insured such as in Class (a) than among the younger group such as in Class (b). On the other hand, the relative deaths from general paralysis of the insane and from cerebral hemorrhage are in accordance with expectations.

Tables 24 and 25 giving the percentages of disability claims and of death claims amongst the disabled, arising from various causes, have been prepared as it has been the practice of many companies to make similar tabulations from time to time. The short periods of exposures, and the consequent low average age, must not be overlooked when comparing the percentages given with those pertaining to individual companies where the average exposures are perhaps longer and therefore the average ages are higher than in the joint investigation. Certain causes of disability, and also of death, have of course proportionately greater weight at young than at old ages, and vice versa.

Had the data been more extensive, further interesting analyses, both as to causes of disability and as to causes of death among the disabled might have been made, which would doubtless have thrown some light on selection for disability benefits as distinguished from life insurance. The Committee did not, however, feel that the extent of the data available was sufficient to warrant the drawing of any conclusions from such results as might have been so obtained.

SECTION D

Warning

In view of the short experience under the forms of Disability Benefit investigated, namely, those providing for a monthly income in event of disability, either with or without the "90 Day Clause", and in view of the different policy provisions regarding Disability Benefits and the diverse practices of the companies in administering the disability claims, the Committee hesitated greatly as to whether or not it should publish rates of premium for the Disability Benefits, but, as the result of many requests, it decided to do so; it felt, however, that these premium rates should not be published without a word of caution as to their use.

Regarding the short period covered by the experience, it is quite evident that, under policies which commenced to be issued only six years or four years before the date of the investigation, the experience would be inadequate for the satisfactory determination of future rates of disability, and still less adequate for determining future rates of death and recovery among disabled lives. The opinion of the various members of the Committee, as to what the future courses of these rates would be, naturally differed, the judgment of each Actuary being affected by the experience and practices of his own company.

Whether or not disability business will prove profitable to a company at any particular rates of premium, will naturally depend largely upon the company's action on the following points:

(a) *When a Policy is Issued*—The cases to which the Disability Benefits are granted, for it is quite possible that an individual may be a satisfactory risk for life insurance purposes but may not be a good risk for Disability Benefits at normal rates;

(b) *When a Claim for Disability is Filed*—The course followed in determining whether or not the case is one in which liability should be admitted and if so the date as of which the benefits should commence: there are many border line cases in which it is difficult to determine whether or not the insured is disabled within the meaning of the contract or the date when the disability commenced: this is particularly the case where the practice is to allow benefits from the date when contract liability *might have been* established instead of from the date when the proofs actually were presented to (or approved by) the company;

(c) *When Subsequent Disability Benefits fall due*—What course the company pursues in determining whether or not the insured is still disabled and entitled to Disability Benefits, for this is of the very greatest importance, particularly in those cases where the Disability Benefits are allowed under the 90 Day Clause, there naturally being a great number of recoveries in such cases.

It is evident that the necessary rates of premium for Disability Benefits very largely depend upon how such business is administered on the above points. Any variation of practice on any of these various points will affect the cost of the benefits.

Furthermore, it has been the general experience that, other conditions remaining the same, the cost of an increased Disability Benefit has been proportionately greater than the increase in the benefit. Likewise, any extension in the Disability Benefits beyond those provided for in previous contracts may have a disproportionate effect on the cost of the new type of benefit. By analogy also to life insurance it might be expected that the experience on insurance for large amounts would be somewhat more unfavorable than that on smaller amounts though the tendency in this direction actually shown by the experience was slight.

The difference in the experiences shown in Classes (2) and (3) is doubtless due, as has been pointed out, to divergent practices on some, at least, of the above points, (a), (b) and (c).

The committee is informed that the companies contributing a large percentage of the data of Class (3) have recently made some changes in the administration of this business with the result that their current experience is already different from that appearing in their contribution to this investigation. It follows, therefore, that the experience shown in Class (3) must not be considered as now applicable even to those companies that contributed the data for that class.

In order that actuaries may see the procedure followed by the Committee in determining from the joint experience the provisional premium rates for Disability Benefits, the basic data are given in this report, and in addition, the processes of graduation, etc. are explained. With this information, any actuary will be in a position to compare his own company's experience with the joint experience. Having duly considered his company's policy provisions for Disability Benefits, its own experience, and its practices in the matter of (a) the issuance of policies with such benefits, (b) admitting disability claims thereunder, and (c) following up disabled lives to see if they are still disabled, he will then be in a position to determine what disability premium rates his company should charge for any particular form of Disability Benefit which his company desires to issue.

As the volume of available experience more especially with regard to the duration of claims is growing rapidly the Committee feels that a further investigation should be made at an early date.

APPENDIX A

Circular of Instructions to Contributing Companies Regarding the Adjustment of Valuation Data to Obtain Exposures by Policy Years

(Referred to on page 7 of text)

Any companies which have obtained the exposures by policy years in a previous study of the rate of disability may furnish those results. (Such companies are asked to note that deaths are to be treated like other terminations, that the exposures of each year of issue should be furnished separately, that the issues of 1924 are included, and the exposures are to be carried to December 31, 1924 with a full year of exposure for the policy year which includes that date.)

The rate of disability is so small, however, that an approximate method of obtaining the exposures from the valuation records is desirable, and approximations along the following lines will be satisfactory for the purposes in hand. The general plan will be that the number and amount in force at each December 31 will represent the exposures for the policy year then current. There will be no adjustment for the exposure of disability claims in the year of disablement since it could not affect the final results. There will be no adjustment to make for deaths, because that is to be done by the central committee in the combined data. Since the data are being supplied by year of issue and the exposures are being carried to *December 31, 1924,* instead of to the anniversary in 1924, adjustments will be required for the year of issue and the last year of exposure in each case.

The adjustment for the year of issue is illustrated as follows for the issues dated in 1921, which will consist of those paid for in 1921 and those paid for in 1922. The exposures of the first policy year may be taken as the in force December 31, 1921, of those paid for in 1921 and dated 1921 plus the gross issues of those paid for in 1922 and dated 1921. (If the gross issues are not of easy access they may be approximated with sufficient accuracy by adding to the in force December 31, 1922, the terminations in 1922 of both first and second policy years.)

For the last policy year of exposure (viz: that which includes December 31, 1924) the exposures to use are the in force figures for December 31, 1924 without adjustment. The period of this exposure is roughly one half year and the central committee will make the needed adjustment.

If the valuation data do not distinguish among the various classes of disability benefits, an adjustment will be required in each policy years' exposures arising from policies dated in the year in which the monthly annuity benefits were introduced, if other than at January first.

An approximation to the exposures which may prove sufficiently accurate for this case is illustrated by the following examples:

(1) Clause first issued April 1, 1921.

Obtain figures as above for the entire number and amount dated 1921. Take ¾ of each of such results as applying to the new clause. The average date of issue of the new clause in 1921 is, say, August 15; the figures thus obtained represent, therefore, the exposures at the end of—

(a) 4½ months instead of (a) 6 months as desired.
(b) 1 yr. 4½ months instead of (b) 1 yr. 6 months as desired.
(c) 2 yr. 4½ months instead of (c) 2 yr. 6 months as desired.
(d) 3 yr. 4½ months instead of (d) 3 yr. 6 months as desired.

The required figures may be obtained by a simple interpolation.

(2) Clause first issued October 1, 1921.

Take ¼ of each of the figures for all policies dated 1921. The average date of issue of the new clause in 1921 is, say, November 15; the figures thus obtained represent the exposures at the end of—

(a) 1½ months instead of (a) 6 months.
(b) 1 yr. 1½ months instead of (b) 1 yr. 6 months.
(c) 2 yr. 1½ months instead of (c) 2 yr. 6 months.
(d) 3 yr. 1½ months instead of (d) 3 yr. 6 months.

A simple interpolation gives the required approximate exposures. An example of a satisfactory interpolation formula is the following, where

$f(o)$ represents the first of the given values,

d stands for difference for the unit interval, and, for the second illustration above,

x equals $(6-1\frac{1}{2})$ divided by 12 or .375.

$f(x)$ equals $f(o)+xdf(o)+\frac{1}{2}x(x-1)d^2 f(o)+1/6x(x-1)(x-2)d^3 f(o)$.

$d f(x)$ equals $df(o)+xd^2 f(o)+\frac{1}{2}x(x-1)d^3 f(o)$.

$d^2 f(x)$ equals $d^2 f(o)+xd^3 f(o)$.

$d^3 f(x)$ equals $d^3 f(o)$.

The fractions ¾ and ¼ in the above examples would, of course, be modified in the event that a more liberal clause produced a greater volume of disability business.

There may be considerable labor involved in some companies in obtaining the in force figures subdivided into the required age-groups. For example, for certain years of issue the division into age-groups may be available for a few durations only, such as for those years only in which a special tabulation had been made. In that case, actual test may show the extent to which the proportions by age-groups vary with duration for the same year of issue. In one company it was found that the division into age-groups could be approximated for a number of intervening years with sufficient accuracy for the present purpose.

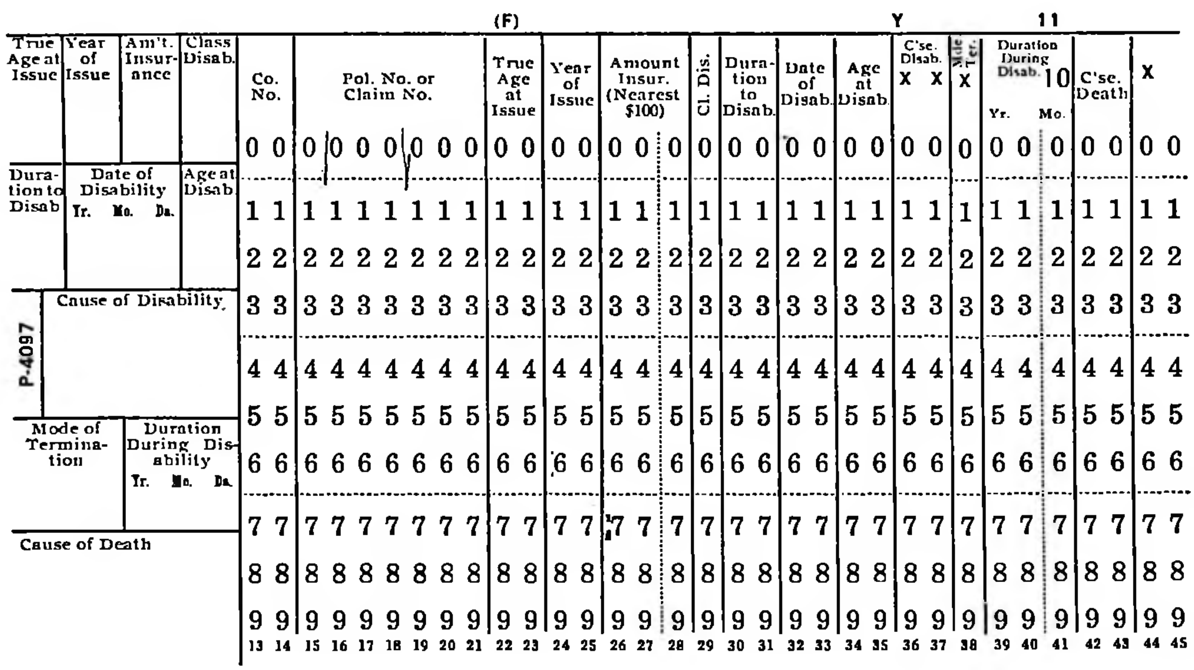
Since this is a problem which will be different in each company the Actuary is requested to make such adaptations of the above principles as in his judgment is desirable.

APPENDIX B

(Referred to on page 8 of text)

Hollerith Card Used in the Reporting of Disability Claims and Instructions to Contributing Companies in Connection Therewith

The following is a copy of the dual Hollerith card, on which the contributing companies were asked to fill out for the Joint Committee the details of the disability claims under individual policies:



The following are the instructions which were issued by the Committee to guide the contributing companies in the determination of the various details required in connection with the reporting of disability claims on individual policies.

True Age at Issue Age to be at nearest birthday. Female will be indicated by perforating Y in the first column of this field.

Class of Disability:

Code Number	Class of Disability
0	Total and Permanent—Waiver only.
1	Total and Permanent—Instalments, beginning at disability.
2	Total and Permanent—Instalments, beginning in 6 months.
3	Total and Permanent—Instalments, beginning in 12 months or more.
4	Total and Permanent—Ann. Income, beginning at disability.
5	Total and Permanent—Ann. Income, beginning in 6 mos.
6	Total and Permanent—Ann. Income, beginning in 12 mos. or more.
7	Total and Permanent—Mo. Income, beginning within 1 mo.
8	Total and Permanent—Mo. Income, beginning in 6 months.
9	180 Day Clause —Mo. Income, beginning in 6 months.
X0	90 Day Clause —Waiver only.
X7	90 Day Clause —Mo. Income, beginning within 1 mo.
X8	90 Day Clause —Mo. Income, beginning in 6 months.

Waiver of Premium is assumed to be included in all clauses.

Duration to Disability: Count the last policy year of exposure as a full year and perforate the total number of years.

Example—Date of issue 1-15-'20, date of disability 6-25-'23, perforate 4 years.

Date of Disability: In all cases the date of disability is the date as of which disability was presumed by the company to be total and permanent.

Age at Disability: Take age at disability as true age at issue increased by the nearest duration from date of issue to date of disability. When the fraction of the duration is exactly 6 months, take nearest odd number of years as duration.

Cause of Disability: Use the code for Cause of Death of the M. A. Investigation. The cause of disability is to be perforated and also written on the card, the latter being in detail. Example, Hip Disease would be handwritten as such, but perforated as "Other varieties of tuberculosis". Most policies now provide that the permanent loss of the sight of both eyes, or of the use of both hands or of both feet or of one hand and one foot shall be considered total and permanent disability, or words of similar purport. None of these conditions, however, is a "cause of disability". Since it will be important to know the number of claims arising out of these conditions, they should be covered by perforating in the first column x for blindness and y for loss of use of two feet, two hands or one hand and one foot. For example, assume a man were to lose two feet in a railway accident. The perforations would be 86, "other varieties of traumatism", and y in the first column for loss of two feet.

An x in the second column of this field indicates that there are two causes of disability. The code perforated should be for the primary or most important cause, both causes to be handwritten.

Mode of Termination: The code to use is as follows:

x = Existing December 31, 1924.

0 = Expired (Including all cases where Contract automatically ceases, such as maturity of an endowment).

1 = Recovered.

9 = Dead.

Duration During Disability: Perforate duration during disability to year and month. If termination is by death, consider the last month of exposure as a full month; example, date of disability 6-25-'21, died 12-28-'21, perforate seven months. For any other mode of termination than death, take the nearest month. Example, date of disability 6-13-'24, existing 12-31-'24, perforate seven months.

Cause of Death: Use the code of the M. A. Investigation.
This is found in Vol. I of the M. A. Reports and also in T. A. S. A. Vol. XI—p. 430.

Exposures to Disability: It is important that the central committee know which cases are included in the exposures to rate of disability. These have already been furnished on sheets. For this purpose, an "X" is to be perforated in the next to the last column of the card on each such case.

Recurrence of Disability: Where recovery lasts less than six months, ignore the period of recovery; where the recovery lasts six months or more, the second disablement shall be considered as a new case of disability. If the second disablement is due to a different cause, treat as a new case regardless of the period of recovery.

APPENDIX C

Diversity of Disability Benefits

(Referred to on pages 8 and 9 of text)

As pointed out on pages 8 and 9, there was a great diversity in the features of the disability benefit clauses of the various companies, but it was impracticable and unnecessary to investigate these variations in features separately; the data regarding each were included in the investigation with that of the appropriate class, as explained on page 8. Some of these variations are listed below:

1. The insurance against disability generally ceased at age 60; in some cases it ceased at 65.

2. The premium waived in some cases was the net premium; in other cases, the gross.

3. The monthly disability income, while generally $10 per $1000 of insurance, in some cases was either less or more than $10.

4. The disability income was generally of a level amount; in other cases it increased after continued disability for a specified period.

5. Sometimes it was required that the whole of the first year's premium be paid before a claim for disability would be entertained; in other cases, the requirement was payment of any instalment of the first year's premium.

6. Sometimes, claims for disability benefits would be entertained only if disability had existed continuously for a specified time; in other cases no such requirement existed.

7. The instalment payments in event of disability sometimes ceased when the face of the policy had been paid, while, in other cases, payments of like amount continued during the insured's lifetime subject to his continued disability.

8. In the case of endowment insurance, the disability income generally ceased at the maturity of the endowment; in other cases it continued thereafter for life, during disability.

9. In the "Specified Disabilities", loss of hands, e.g., some policies provided for payment in event of "severance" of hands, while others provided for payment in event of "loss of use" of hands.

10. Payment of disability benefits was excluded, in some cases, in event of claims arising from military or naval service, participation in aeronautics, self-inflicted injury, police duty, foreign travel, etc., etc.; in other cases there was not such exclusion.

11. In some few cases, in the event of disability before 60, and its continuance until 60, the policy provided that the sum insured would be payable at 60—five years after disability if it occurred after age 55.

12. In the case of unmarried female risks, the insurance against disability in some few forms ceased on marriage.

APPENDIX D

For the information of those who may not be familiar with the exact nature of the disability provisions which are the subject of this investigation the following specimen forms are given:

(A) Disability Provision WITHOUT the "90 Day Clause":

The company in consideration of an additional premium of .... dollars and ...... cents, payable at the same time and under the same conditions as the regular premium under the policy to which this agreement is attached, except that the additional premium shall cease on the anniversary of the policy after the insured has attained sixty years of age, doth hereby agree, that if while the above numbered policy is in full force and effect and before default in the payment of any premium, the company receives due proof that the insured, as the result of injury or disease occurring and originating after the issuance of the policy, has become totally and permanently disabled so as to be unable at any time to perform any work or engage in any business for compensation or profit, the company will allow the following benefits:

(a) Provided said disability occur before the insured attains sixty years of age, but not otherwise, the company, commencing with the anniversary of the policy next following receipt of such proof, will waive payment of each premium becoming due during such disability, and, in addition, commencing six months from the receipt of such proof, will pay each month, during the continuance of such disability, to the insured, or to the person designated by him for the purpose, or if there be no such person designated, then to such person as may be found by the company to have the care of the person of the insured, a monthly annuity of $10 for each $1,000 of original insurance under the policy. The waiving of premiums and the monthly annuity payments shall be in addition to all other benefits and shall not affect any provision in the policy, except if there be any indebtedness under the policy, the interest on such indebtedness shall, if not otherwise paid, be deducted from the monthly annuity payments. The insured shall not have the right to commute such monthly annuity payments.

(b) Provided said disability occur after the insured has attained sixty years of age, the company, commencing with the anniversary of the policy next following receipt of such proof, will allow all premiums thereafter becoming due during such disability to accumulate without interest as an indebtedness against the policy, and the values provided for under the provision

"Options on Surrender or Lapse" shall, subject to the indebtedness thus created, and any other indebtedness existing under the policy, increase in the same manner as if the premiums were being paid by the insured.

This provision may be discontinued by the insured by written request to the company, such change to take effect upon return of the policy, together with this agreement, to the company and the endorsement of such cancellation hereon. This provision shall become inoperative if the insured shall, within five years from the date of the policy, engage in military or naval service in time of war and any unearned premium on account of this provision, at the date of entering such service, will be returned upon demand. After discharge from such service, on evidence of physical condition satisfactory to the company, this provision will be restored under its original terms. Whenever this provision shall become inoperative, the additional charge therefor shall no longer be payable.

Without prejudice to any other cause of disability, the entire and irrecoverable loss of the sight of both eyes, or the severance of both hands above the wrists, or of both feet above the ankles, or of one entire hand and one entire foot, will be considered as total and permanent disability within the meaning of this provision. Notwithstanding proof of disability may have been accepted by the company as satisfactory, the insured shall at any time, but not oftener than once a year, on demand from the company, furnish due proof of the continuance of such disability; and if the insured shall fail to furnish such proof, or if the insured is able to perform any work or engage in any business whatsoever for compensation or profit, no further premiums will be waived or allowed to accumulate as an indebtedness against the policy nor will any further monthly annuity payments be made.

(B) DISABILITY PROVISION WITH THE "90 DAY CLAUSE":

If the insured becomes wholly and permanently disabled before age 60 the Society will waive subsequent premiums and pay to the insured a disability annuity of .... dollars a month, subject to the following terms and conditions:

(I) Disability Benefits before age 60 shall be effective upon receipt of due proof, before default in the payment of premium, that the insured became totally and permanently disabled by bodily injury or disease after this policy became effective and before its anniversary upon which the insured's age at nearest birthday is 60 years, in which event the Society will grant the following benefits: (a) Waive payment of all premiums payable upon this policy falling due after the receipt of such proof and during the continuance of such total and permanent disability; and (b) pay to the insured a monthly disability annuity as stated above; the first payment to be payable upon receipt of due proof of such disability and subsequent payments monthly thereafter during the continuance of such total and permanent disability.

(Note:—Any premiums so waived and any disability annuity so paid shall not be deducted from any amount payable in any settlement of this policy.)

Disability shall be deemed to be total when it is of such an extent that the insured is prevented thereby from engaging in any occupation or performing any work for compensation of financial value, and *such total disability shall be presumed to be permanent when it is present and has existed continuously for not less than three months;* and, further, the entire and irrecoverable loss of sight of both eyes, or the severance of both hands at or above the wrists, or of both feet at or above the ankles, or of one entire hand and one entire foot, will of themselves be considered as total and permanent disability within the meaning of this provision.

(II) Disability Benefit after age 60. In case the insured after attaining age sixty, and while this policy is in full force and effect, becomes totally and permanently disabled as above described, and furnishes due proof thereof, the Society, subject to the conditions above stated, will on each subsequent anniversary date of this policy during the continuance of such disability waive payment of the premium, if any, for the ensuing policy year, whereupon the amount of insurance shall become reduced by the amount of premiums so waived and subsequent premiums and loan and surrender values shall be reduced proportionately.

(III) Recovery from disability. The Society shall have the right at any time or times during the first two years after receipt of such proof of disability, but thereafter not more frequently than once a year, to require proof of the continuance of such total disability. If the insured shall fail to furnish satisfactory proof thereof, or if it appears at any time that the insured has become able to engage in any occupation or perform any work for compensation of financial value, no further premiums will be waived and no further disability annuity payments will be made hereunder on account of such disability.

(IV) Military or Naval Service. Disability resulting directly or indirectly from military or naval service in time of war is not a risk assumed by the Society.

The foregoing disability provision is granted in consideration of the payment of an additional premium of $...... with each annual premium payable under this policy, commencing .... Upon any anniversary of this policy said disability provision may be discontinued by returning this policy to the Society for proper endorsement, with a written request signed by the insured (or assignee if any) and thereafter the payment of the premium for such provision shall not be required.