conditions will have on loss distributions during the period under study. For example, law amendments obviously can affect the characteristics of a loss distribution. Changes in wage level may also affect the shape of the distributional curve because of the maximum and minimum limitations on workmen's compensation benefits. A Supreme Court decision applicable to a particular type of injury is another factor to be taken into account. These changes may not appreciably affect a distribution over a short period of time such as Mr. Dropkin has used in his analysis of California data, but such changes could significantly affect loss distributions over a longer period of time which would be required if other states were being reviewed.

The California Unit Statistical Plan requires that all indemnity cases be listed separately regardless of amount. Under the present National Council rules, all claims which have a total loss (indemnity and medical combined) less than $500 may be lumped together. A good percentage of temporary total cases are under $500 and, are reported on a combined basis. In addition, there are a number of minor permanent partial cases under $500. Hence, loss distributions that might be developed for other states would have as its first interval all claims under $500. This means that a study of the other states would be useful if we are concerned only with the larger loss sizes. This suggests that a mathematical analysis of the upper parts of a loss distribution would involve the theory of extreme values. This could be a good subject for a future paper.

Development of losses beyond a first reporting basis can be significant, particularly for serious injuries. Unfortunately, Mr. Dropkin's analysis had to be confined to first reporting figures, since losses were not available on a per-claim basis on a subsequent reporting basis.

It is hoped that the problems to be faced in analyzing loss distributions for other states can be met with successfully in order that we can augment the very fine work that Mr. Dropkin has initiated in California.

DISCUSSION BY LeROY J. SIMON

We all know what to expect when we read a paper by Mr. Dropkin. We expect to get some new ideas, come interesting information and a careful, precise and correct presentation which mixes both the practical and the theoretical. In his paper, Size of Loss Distributions in Workmen's Compensation Insurance, we are not disappointed. The interesting information this time comes in the form of a series of ten actual distributions of losses in Workmen's Compensation. One of the significant new ideas that we get from the paper is an introduction to the Kolmogorov test. The blending of the theoretical and practical is quite evident in Mr. Dropkin's summary at the end of the paper. Hence, any comments I make will be either supplementary to what the author has said or will look into areas which are outside of the scope that the author set for himself in the original paper.

Basic distributions of losses of this sort are fundamental to the Theory of Risk. If we could have a theory with enough of an empirical basis, we could not only have better based "D" ratios but could also find it quite helpful in constructing Table M, determining excess of loss factors and in establishing S-Points. While the Theory of Risk may not be sufficiently advanced in the United States to make its use feasible at this time in the construction of Table M, the determination of excess of loss factors is a rather straightforward calculation which can be easily demonstrated. Exhibit A is a calculation based on policy year 1961 of the excess losses over six different levels of loss. It was necesary to assume that the Medical Only losses were all less than \$10,000 which is undoubtedly a safe assumption. It is unfortunate that Mr. Dropkin did not include a distribution of the Medical Only claims, even though he would have been forced to make the first interval extend from 0 to \$500. One must be careful when referring to these excess of loss factors to recall that the raw data is from first reports under the Unit Statistical Plan. This means that some of the losses have been evaluated with as little as six months or less (depending upon individual company processing methods) of elapsed time since the accident occurred. The maximum amount of time of evaluation would be 18 months. The general tendency is for certain claims to become more severe as they age and the excess of loss factors are influenced markedly by the presence of large losses. One must view these figures as minimum indications and recognize that they apply only to California in policy year 1961. Extensions beyond this scope can be made, of course, subject to the use of sound actuarial judgment. Both curve fitting techniques and statistical tests of significance could be used in this area to smooth out the irregularities in the raw data and to help decide when a set of excess of loss factors have need of revision.

In our experience rating plans in Workmen's Compensation we attempt to establish a point at which the insured will become entirely self-rated (the S-Point). Any system for determining S will have a set of controls which will attempt to minimize any sharp variation from one year to the next. One typical technique is to use two or more years of data, dropping out the earliest and adding in the latest year each time. Ignoring these types of controls, one system in use in the past for determining S was to make it a function of the average Death and Permanent Total loss in the state. It was found that the variations in this statistic were quite violent (especially in the smaller states), and a considerable degree of arbitrary control had to be imposed upon the result. In an effort to avoid this, the National Council on Compensation Insurance went to a function of the average Serious case (where Serious cases are Death, Permanent Total and Major Permanent Partials). A third method which has been suggested by this reviewer is based upon the percentile values of the distribution of losses excluding the Medical Only cases. The general reasoning is based upon the fact that the *S*-Point should be located at a point where the premium from year to year on risks that are at or above this point will be relatively stable. In other words, if the risk is going to have 100% credibility, he should have a fairly stable premium from one rating period to the next. It is also desirable to have *S* vary from state to state since the laws vary on a state basis and, hence, the distribution of losses will vary this way also. Finally, *S* should change if the law within a state changes in such a way as to make the loss distribution more "dangerous" or less "dangerous." This is another example of the age-old actuarial problem of wanting responsiveness to changing conditions, but wanting protection from unnecessary random fluctuation. Exhibit B consolidates the data from Mr. Dropkin's paper into a single distribution for each policy year. This type of information was used to locate certain percentile values. In each case a careful study of the published distributions by type of injury was made to establish the percentile value as accurately as possible. In actual practice one would use ungrouped data and obviate the need for approximation. In Exhibit C we have a comparison of the variation from one year to the next in the average Death and Permanent Total value, the average Serious case value and each of a number of percentile values. We can see from this exhibit that the two average value figures did not change much, while each of the percentile values moved up sharply. This latter fact indicates that the distribution has become more "dangerous" and, hence, there *should* be an increase in the 100% credibility point. Further experimentation along this avenue of approach to establishing the *S*-Point seems worthwhile.

It is appropriate to point out here that the entire change from 1960 to 1961 cannot be attributable to random fluctuation since there were two law amendments which have an effect upon the two sets of data. The individual losses are included in the loss distributions at the incurred cost to the company and are unadjusted for the effect of any benefit level changes. Mr. Dropkin has written me as follows:

"There was a change in benefit level effective September 15, 1961. The calculated effect was as follows:

Type of Injury	Effect	
Death	1.005	
P.T.	1.001	
Major	1.007	
Serious		1.006
Minor	1.011	
Temp.	1.039	
Non-Serious		1.018
Medical		1.000
Total		1.009

It should be noted that the effects listed above are for the indemnity portion and the total medical portion separately, while the incurred loss size used in the basic distribution represent the indemnity and medical amounts combined. Also, effective October 1, 1962, there was a change in the Official Minimum Medical Fee Schedule which was applicable to all injuries whenever they may have occurred. In calculating the effect in this case we considered only new injuries since there is no good way to measure the effect on old ones. The calculated effect was:

Indemnity	1.000
Medical	1.025
Total	1.008"

The use of the one-sample Kolmogorov test leads rather naturally to the use of the two-sample Kolmogorov test to test the hypothesis that the two samples could have been drawn from the same population. Hoel[1] does not feel that this test possesses any advantages over other non-parametric methods for dealing with this problem. However, Siegel[2] cites it as the most powerful test available for continuous distributions when we wish to test for any kind of difference in the two samples. We proceed in the two-sample Kolmogorov test by evaluating D_{mn} as the maximum absolute deviation between the two observed cumulative frequencies that we are testing. If $S_m(x)$ and $S_n(x)$ are the two observed cumulative relative frequencies in the samples of sizes m and n, then

[1] Hoel, Paul G., *Introduction to Mathematical Statistics*, Third Edition, John Wiley & Sons, Inc., New York, 1962, p. 349.

[2] Siegel, Sidney, *Nonparametric Statistics for the Behavioral Sciences*, McGraw-Hill Book Company, Inc., 1956, p. 157.

$$D_{mn} = \max_x \left| S_m(x) - S_n(x) \right|$$

For small samples and when $m = n$, published tables are available for the test of significance. However, when the number of cases exceeds 40 in each sample, the critical value can be found by the formula $k\sqrt{\frac{m+n}{mn}}$ where k is 1.3581 at the 5% level and 1.6276 at the 1% level. The test then reduces to comparing the sample value of D_{mn} against the critical value at the level of significance desired. Exhibits D through H set forth the two observed cumulative relative frequency distributions and the differences necessary to determine D_{mn}. Each of the exhibits has been shortened somewhat, especially by coarser grouping in the upper tails, but no significant information has been omitted. Exhibit E of Permanent Total cases is different only because the raw data was set forth for each case separately, while all other distributions were presented on a grouped basis. Column (5) of Exhibit I sets forth the sample value of D_{mn} for each of the types of loss. Columns (3) and (4) show the critical values of D_{mn} at the two significance levels most commonly used by statisticians, and column (6) shows the conclusion reached on the hypothesis that the two samples came from the same population (against the alternative that they came from different populations). The rule used is to accept the hypothesis below the 5% level, to reject it above the 1% level and to remain in doubt when the sample statistic falls between these two levels. In the case of Temporary losses the sample statistic puts us in the doubtful area. With access to the entire raw data, it would be well to go back to the interval 650-699 and investigate more carefully on a case-by-case basis to determine the true maximum value of the statistic D_{mn}. A similar investigation would be made in the interval 800-849. This may very well lead to a value in excess of .0096 and, thus, lead to rejection of the hypothesis at the 1% level. This illustrates one of the problems when dealing with grouped data. If the grouping is too coarse, a significant difference between distributions can be completely masked. If there is any grouping at all and the test statistic gets close to the critical value, the researcher must go back and get more information in order to arrive at his conclusion. This two-tailed Kolmogorov two-sample test is appropriate when one wishes to investigate whether the distributions come from the same population or not.

If we have evidence that one distribution may have arisen from a population with a higher (or lower) distribution, the appropriate test would be a one-tailed test of significance. In the case we have here we know that the policy year 1961 data comes to us with more of the losses subjected to the law with higher benefit levels in it. We may, therefore, wish to test the hypothesis that the distribution of policy year 1961 losses is higher than the distribution of policy year 1960 losses. This can be done by again calculating the sample statistic D'_{mn} where D'_{mn} is the maximum difference between the two observed cumulative relative frequencies *in the desired direction*. From this we calculate

$$\chi^2 = 4\,(D'_{mn})^2\,\frac{mn}{m+n}$$

This time the critical value is the value of Chi-square with two degrees of freedom. The values of χ^2 are set forth in column (8) of Exhibit I and the conclusions with regard to the hypothesis are in column (9). The extremely high probability on Death cases (χ^2 at .99 is .020) makes one suspicious that we are testing the wrong hypothesis, and perhaps some other factors are at work in addition to law level and random fluctuation.

In setting forth a few cautions about the use of the one-sample Kolmogorov test, Mr. Dropkin says that it is exact only when the data is "unclassified" (that is, ungrouped). He also cautions us that if parameters are estimated from the data, the Kolmogorov test is affected; but it is not known exactly what the effect will be. He recommends that to correct for this we use a critical value smaller than would otherwise be used. Another way of saying the same thing would be that if a sample statistic leads to the rejection of the hypothesis, one could be confident that he was safe in rejecting the hypothesis at the given level of significance. However, if the sample value leads to accepting the hypothesis by a rather thin margin of difference between the sample value and the critical value, one would feel a little unsure about accepting the sample at the specified significance level if some of the parameters had to be estimated from the sample data.

Mr. Dropkin opens up the rather interesting area of outliers when he discusses the problems with the case evaluated at $1,840 among his Permanent Total cases for policy year 1961. With a case that stands out as far as this, we can use a rather straightforward approach which is not particularly powerful. If we assume that the sample is, in fact, from a lognormal distribution with a mean and standard deviation as set forth in Exhibit 21 of the paper, we can quickly calculate that a case such as this falls 5.546 standard deviations away from the mean. The probability of such a rare event (or one more rare) occurring in random sampling is .00000003. Since we have a sample of 57 cases, the binomial probability of an event like this (or one more rare) occurring one or more times is:

$$1 - (.99999997)^{57}$$

This equals .000002 and we would conclude that an event such as this in a sample of this size is quite unlikely. Therefore, we would reject the hypothesis that this was a true Permanent Total case which arose solely due to chance fluctuation. It can be treated as an outlier and justifiably excluded from the sample. If the sample were smaller and a rigorous test were still needed for the outlier, tables of the critical values of the studentized extreme deviate are available.[3]

This useful and important paper will undoubtedly be referred to many times. It will be helpful to have such distributions available for ready reference in the solution or approximation of solutions to a number of problems. The use of distribution-free tests in insurance statistics is bound to gain more acceptance as time goes on. Mr. Dropkin's fine description and illustration of the Kolmogorov one-sample test will be a handy reference. The paper was not only interesting but informative; not only theoretical but practical; not only advanced but understandable. It is a fine addition to our actuarial literature.

[3] *Biometrika Tables for Statisticians*, Volume I, Second Edition, Cambridge University Press, 1958.

EXHIBIT A

CALIFORNIA WORKMEN'S COMPENSATION

Policy Year 1961

Type	All Losses	Losses in Excess of: $10,000	$15,000	$25,000	$50,000	$100,000	$250,000
Death	$ 11,743,540	5,403,256	2,794,965	111,616	23,090	0	0
Permanent Total	5,889,192	5,327,352	5,047,352	4,487,352	3,109,595	1,270,247	85,996
Major	64,619,490	21,012,513	10,369,092	4,148,381	1,182,909	186,092	0
Minor	79,462,086	1,249,416	195,332	20,845	0	0	0
Temporary	31,032,492	96,703	11,400	0	0	0	0
Medical Only	16,456,429	0	0	0	0	0	0
Total	209,203,229	33,089,240	18,418,141	8,768,194	4,315,594	1,456,339	85,996
Ratio to All Losses		.1582	.0880	.0419	.0206	.0070	.0004

EXHIBIT B

CALIFORNIA WORKMEN'S COMPENSATION
Distribution of All Types
Policy Year 1960

Loss Size Interval	Number of Cases	Sum Up
0 - 4,999	71,759	79,875
5,000 - 5,499	847	8,116
5,500 - 7,999	2,903	7,269
8,000 - 8,499	395	4,366
8,500 - 12,999	2,183	3,971
13,000 - 16,499	675	1,788
16,500 - 16,999	62	1,113
17,000 - 33,999	935	1,051
34,000 - 45,499	35	116
45,500 - 45,999	3	81
46,000 - 299,999	78	78

Policy Year 1961

Loss Size Interval	Number of Cases	Sum Up
0 - 5,499	80,859	90,559
5,500 - 5,999	879	9,700
6,000 - 9,499	4,084	8,821
9,500 - 9,999	370	4,737
10,000 - 14,999	2,396	4,367
15,000 - 20,999	1,140	1,971
21,000 - 49,999	726	831
50,000 - 53,652	14	105
53,653	1	91
53,327	1	90
53,328 - 339,999	89	89

Note: The loss size intervals have been selected to facilitate location of the percentile values shown in Exhibit C while reducing the length of the exhibit to a minimum.

EXHIBIT C

CALIFORNIA WORKMEN"S COMPENSATION
Some Possible Statistics for Determining the
Self-Rating Point under the Experience Rating Plan

	Policy Year 1960		Policy Year 1961		
	Case Number	Value	Case Number	Value	Change
Average Death and Permanent Total	--	$21,700	--	$21,300	-2%
Average Serious Case	--	$14,600	--	$14,800	+1%
Percentiles					
99.9	80	$45,700	91	$53,500	+17%
99	799	18,100	906	20,300	+12%
98	1,598	13,700	1,811	16,000	+17%
95	3,994	8,470	4,528	9,780	+15%
90	7,988	5,080	9,056	5,870	+16%

CALIFORNIA WORKMEN'S COMPENSATION
Death Cases -- Two Policy Years

Loss Size Interval	Cumulative Observed Frequency 1960	Cumulative Observed Frequency 1961	Difference
0 - 499	.0237	.0208	.0029
500 - 999	.0854	.0805	.0049
1,000 - 1,499	.1076	.0974	.0102
1,500 - 1,999	.1250	.1078	.0172
2,000 - 2,499	.1345	.1221	.0124
2,500 - 2,999	.1408	.1390	.0018
3,000 - 3,499	.1503	.1481	.0022
3,500 - 3,999	.1519	.1584	-.0065
4,000 - 4,499	.1693	.1675	.0018
4,500 - 4,999	.1725	.1792	-.0067
5,000 - 5,499	.1867	.2078	-.0211
5,500 - 5,999	.1930	.2143	-.0213
6,000 - 6,499	.2041	.2182	-.0141
6,500 - 6,999	.2073	.2234	-.0161
7,000 - 7,499	.2120	.2273	-.0153
7,500 - 7,999	.2263	.2429	-.0166
8,000 - 8,499	.2326	.2571	-.0245
8,500 - 8,999	.2405	.2610	-.0205
9,000 - 9,499	.2468	.2688	-.0220
9,500 - 9,999	.2500	.2753	-.0253
10,000 - 10,499	.2722	.2870	-.0148
10,500 - 10,999	.2848	.3078	-.0230
11,000 - 11,499	.2927	.3143	-.0216
11,500 - 11,999	.2959	.3195	-.0236
12,000 - 12,499	.2975	.3260	-.0285
12,500 - 12,999	.3006	.3312	-.0306
13,000 - 13,499	.3070	.3338	-.0268
13,500 - 13,999	.3085	.3403	-.0318
14,000 - 14,499	.3149	.3403	-.0254
14,500 - 14,999	.3212	.3455	-.0243
15,000 - 15,499	.3307	.3571	-.0264
15,500 - 15,999	.3323	.3623	-.0300
16,000 - 16,499	.3354	.3662	-.0308
16,500 - 16,999	.3370	.3714	-.0344
17,000 - 17,499	.3497	.3844	-.0347
17,500 - 17,999	.3655	.3935	-.0280
18,000 - 18,499	.4968	.5221	-.0253
18,500 - 18,999	.5269	.5481	-.0212
19,000 - 19,499	.5475	.5636	-.0161
19,500 - 19,999	.5680	.5792	-.0112
20,000 - 20,499	.5823	.5948	-.0125
20,500 - 20,999	.6060	.6091	-.0031
21,000 - 21,499	.9035	.8857	-.0178
21,500 - 21,999	.9415	.9286	-.0129
22,000 - 22,499	.9589	.9468	.0121
22,500 - 22,999	.9715	.9584	.0131
23,000 - 23,499	.9810	.9806	.0004
23,500 - 23,999	.9889	.9885	.0004
24,000 - 73,499	1.0000	1.0000	.0000

EXHIBIT E

CALIFORNIA WORKMEN'S COMPENSATION
Permanent Total Cases - Two Policy Years

Loss Size		Cumulative Observed Frequency		
1960	1961	1960	1961	Difference
*	*	*	*	*
46,000	46,000	.1522	.0526	.0996
	48,457		.0702	.0820
	50,247		.0877	.0645
	53,200		.1053	.0469
	53,327		.1228	.0294
	53,653		.1404	.0118
54,825		.1739		.0335
	55,000		.1579	.0160
55,338		.1957		.0378
56,000		.2174		.0595
56,001		.2391		.0812
58,506		.2609		.1030
58,600		.2826		.1247
	59,371		.1754	.1072
59,673		.3043		.1289
	62,100		.1930	.1113
62,500		.3261		.1331
	62,522		.2105	.1156
63,291		.3478		.1373
	63,800		.2281	.1197
	64,588		.2456	.1022
	64,726		.2632	.0846
	65,340		.2807	.0671
67,206		.3696		.0889
68,391		.3913		.1106
	68,874		.2982	.0931
69,653		.4130		.1148
	70,639		.3158	.0972
	72,679		.3333	.0797
	73,391		.3509	.0621
	75,000		.3684	.0446
75,394		.4348		.0664
	75,500		.3860	.0488
	76,823		.4035	.0313
	77,711		.4211	.0137
	79,304		.4386	-.0038
80,000		.4565		.0179
	81,969		.4561	.0004
	83,000		.4737	-.0172
	83,481		.4912	-.0347
	86,690		.5088	-.0523
86,828		.4783		-.0305
	89,000		.5263	-.0480
89,028		.5000		-.0263
	93,410		.5439	-.0439
	94,816		.5614	-.0614
	99,187		.5789	-.0789
	100,187		.5965	-.0965
	100,340		.6140	-.1140
	101,090		.6316	-.1316
	101,312		.6491	-.1491
	103,515		.6667	-.1667
104,500		.5217		-.1450
107,326		.5435		-.1232
	107,493		.6842	-.1407
	108,485		.7018	-.1583
	108,637		.7193	-.1758
	109,521		.7368	-.1933
	111,591		.7544	-.2109
114,514		.5652		-.1892
	115,547		.7719	-.2067
118,144		.5870		-.1849
119,874		.6087		-.1632
121,200		.6304		-.1415
125,000		.6522		-.1197
128,985		.6739		-.0980
	132,946		.7895	-.1156
135,844		.6957		-.0938
139,845		.7174		-.0721
141,564		.7391		-.0504
	145,787		.8070	-.0679
147,563		.7609		-.0461
147,663		.7826		-.0244
	150,000		.8246	-.0420
	152,015		.8421	-.0595
	156,995		.8596	-.0770
159,121		.8043		-.0553
161,415		.8261		-.0335
164,208		.8478		-.0118
165,183		.8696		.0100
*	*	*	*	*

EXHIBIT F

CALIFORNIA WORKMEN'S COMPENSATION

Major Permanent Partial Cases - Two Policy Years

Loss Size Interval	Cumulative Observed Frequency 1960	1961	Difference
0 - 4,999	.0171	.0195	-.0024
5,000 - 5,499	.0238	.0290	-.0052
5,500 - 5,999	.0379	.0423	-.0044
6,000 - 6,499	.0584	.0660	-.0076
6,500 - 6,999	.0865	.0923	-.0058
7,000 - 7,499	.1208	.1252	-.0044
7,500 - 7,999	.1639	.1619	.0020
8,000 - 8,499	.2106	.2012	.0094
8,500 - 8,999	.2586	.2473	.0113
9,000 - 9,499	.3143	.2940	.0203
9,500 - 9,999	.3672	.3392	.0280
10,000 - 10,499	.4271	.3880	.0391
10,500 - 10,999	.4729	.4309	.0420
11,000 - 11,499	.5194	.4717	.0477
11,500 - 11,999	.5604	.5093	.0511
12,000 - 12,499	.5986	.5532	.0454
12,500 - 12,999	.6273	.5887	.0386
13,000 - 13,499	.6640	.6271	.0369
13,500 - 13,999	.6986	.6579	.0407
14,000 - 14,499	.7252	.6879	.0373
14,500 - 14,999	.7450	.7165	.0285
15,000 - 15,499	.7713	.7447	.0266
15,500 - 15,999	.7930	.7659	.0271
16,000 - 16,499	.8086	.7877	.0209
16,500 - 16,999	.8260	.8034	.0226
17,000 - 17,499	.8398	.8195	.0203
17,500 - 17,999	.8520	.8352	.0168
18,000 - 18,499	.8658	.8521	.0137
18,500 - 18,999	.8753	.8614	.0139
19,000 - 19,499	.8847	.8720	.0127
19,500 - 19,999	.8942	.8845	.0097
20,000 - 20,499	.9046	.8959	.0087
20,500 - 20,999	.9098	.9029	.0069
21,000 - 21,499	.9168	.9109	.0059
21,500 - 21,999	.9227	.9181	.0046
22,000 - 22,499	.9297	.9234	.0063
22,500 - 22,999	.9346	.9283	.0063
23,000 - 23,499	.9398	.9334	.0064
23,500 - 23,999	.9444	.9368	.0076
24,000 - 24,499	.9489	.9410	.0079

Loss Size Interval	Cumulative Observed Frequency 1960	1961	Difference
24,500 - 24,999	.9502	.9446	.0056
25,000 - 25,499	.9566	.9490	.0076
25,500 - 25,999	.9587	.9518	.0069
26,000 - 26,499	.9606	.9546	.0060
26,500 - 26,999	.9624	.9561	.0063
27,000 - 27,499	.9636	.9576	.0060
27,500 - 27,999	.9642	.9604	.0038
28,000 - 28,499	.9664	.9617	.0047
28,500 - 28,999	.9685	.9642	.0043
29,000 - 29,499	.9691	.9657	.0034
29,500 - 29,999	.9707	.9670	.0037
30,000 - 30,499	.9722	.9687	.0035
30,500 - 30,999	.9731	.9691	.0040
31,000 - 31,499	.9737	.9695	.0042
31,500 - 31,999	.9740	.9703	.0037
32,000 - 188,499	1.0000	1.0000	.0000

EXHIBIT G

CALIFORNIA WORKMEN'S COMPENSATION

Minor Permanent Partial Cases - Two Policy Years

Loss Size Interval	Cumulative Observed Frequency 1960	Cumulative Observed Frequency 1961	Absolute Difference
0 - 99	.0022	.0022	.0000
100 - 199	.0064	.0063	.0001
200 - 299	.0123	.0134	-.0011
300 - 399	.0211	.0221	-.0010
400 - 499	.0318	.0325	-.0007
500 - 599	.0501	.0507	-.0006
600 - 699	.0749	.0741	.0008
700 - 799	.1059	.1021	.0038
800 - 899	.1383	.1323	.0060
900 - 999	.1702	.1609	.0093
1,000 - 1,499	.3046	.2905	.0141
1,500 - 1,999	.4155	.3995	.0160
2,000 - 2,499	.5084	.4951	.0133
2,500 - 2,999	.5837	.5725	.0112
3,000 - 3,499	.6527	.6409	.0118
3,500 - 3,999	.7129	.6991	.0138
4,000 - 4,499	.7640	.7524	.0116
4,500 - 4,999	.8051	.7962	.0089
5,000 - 5,499	.8411	.8318	.0093
5,500 - 5,999	.8707	.8621	.0086
6,000 - 6,499	.8983	.8862	.0121
6,500 - 6,999	.9187	.9074	.0113
7,000 - 7,499	.9365	.9250	.0115
7,500 - 7,999	.9503	.9390	.0113
8,000 - 8,499	.9609	.9520	.0089
8,500 - 8,999	.9689	.9614	.0075
9,000 - 9,499	.9757	.9703	.0054
9,500 - 9,999	.9814	.9760	.0054
10,000 - 10,499	.9868	.9814	.0054
10,500 - 10,999	.9899	.9852	.0047
11,000 - 11,499	.9924	.9885	.0039
11,500 - 11,999	.9940	.9906	.0034
12,000 - 35,499	1.0000	1.0000	.0000

EXHIBIT H

CALIFORNIA WORKMEN'S COMPENSATION

Temporary Cases - Two Policy Years

Loss Size Interval	Cumulative Observed Frequency 1960	1961	Absolute Difference
0 - 9	.0017	.0012	.0005
10 - 19	.0052	.0042	.0010
20 - 29	.0132	.0119	.0013
30 - 39	.0272	.0256	.0016
40 - 49	.0488	.0470	.0018
50 - 59	.0756	.0738	.0018
60 - 69	.1049	.1041	.0008
70 - 79	.1353	.1342	.0011
80 - 89	.1658	.1648	.0010
90 - 99	.1946	.1939	.0007
100 - 149	.3211	.3185	.0026
150 - 199	.4143	.4129	.0014
200 - 249	.4880	.4861	.0019
250 - 299	.5442	.5438	.0004
300 - 349	.5958	.5931	.0027
350 - 399	.6361	.6336	.0025
400 - 449	.6727	.6671	.0056
450 - 499	.7022	.6955	.0067
500 - 549	.7289	.7226	.0063
550 - 599	.7513	.7451	.0062
600 - 649	.7754	.7674	.0080
650 - 699	.7956	.7871	.0085
700 - 749	.8153	.8071	.0082
750 - 799	.8345	.8264	.0081
800 - 849	.8523	.8438	.0085
850 - 899	.8676	.8596	.0080
900 - 949	.8812	.8731	.0081
950 - 999	.8915	.8836	.0079
1,000 - 1,499	.9437	.9388	.0049
1,500 - 1,999	.9634	.9599	.0035
2,000 - 2,499	.9748	.9720	.0028
2,500 - 2,999	.9822	.9792	.0030
3,000 - 3,499	.9869	.9847	.0022
3,500 - 3,999	.9901	.9883	.0018
4,000 - 4,499	.9925	.9912	.0013
4,500 - 4,999	.9941	.9932	.0009
5,000 - 5,499	.9955	.9948	.0007
5,500 - 33,999	1.0000	1.0000	.0000

EXHIBIT I

TESTS OF SIGNIFICANCE

Type	Number of Cases 1960	Number of Cases 1961	Critical Values 5% Level	Critical Values 1% Level	Sample Value of D_{mn}	Hypothesis*	Sample Value of D'_{mn}	χ^2	Hypothesis**
Death	632	770	.0729	.0874	.0347	Accept	.0172	.02	Accept
Permanent Total	46	57	.2695	.3229	.2109	Accept	.1373	.38	Accept
Major	3,271	4,721	.0309	.0370	.0511	Reject	.0511	20.18	Reject
Minor	20,554	24,613	.0129	.0154	.0160	Reject	.0160	11.47	Reject
Temporary	55,372	60,398	.0080	.0096	.0085	Doubt	.0085	8.35	Doubt

* The two samples could have come from populations having the same distribution function; alternative, they come from populations having different distribution functions. D_{mn} is the maximum absolute difference.

** The two samples could have come from populations having the same distribution function; alternative, they come from populations having the 1961 distribution function higher than (that is, to the right of) the 1960 distribution function. Critical values for the one-tailed test are from χ^2 with 2 degrees of freedom; 5.99 at 5% point and 9.21 at 1% point. D'_{mn} is the maximum positive difference.