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NOTICE

The Society is not responsible for statements made or opinions expressed in the articles, criticisms and discussions published in these *Proceedings.*

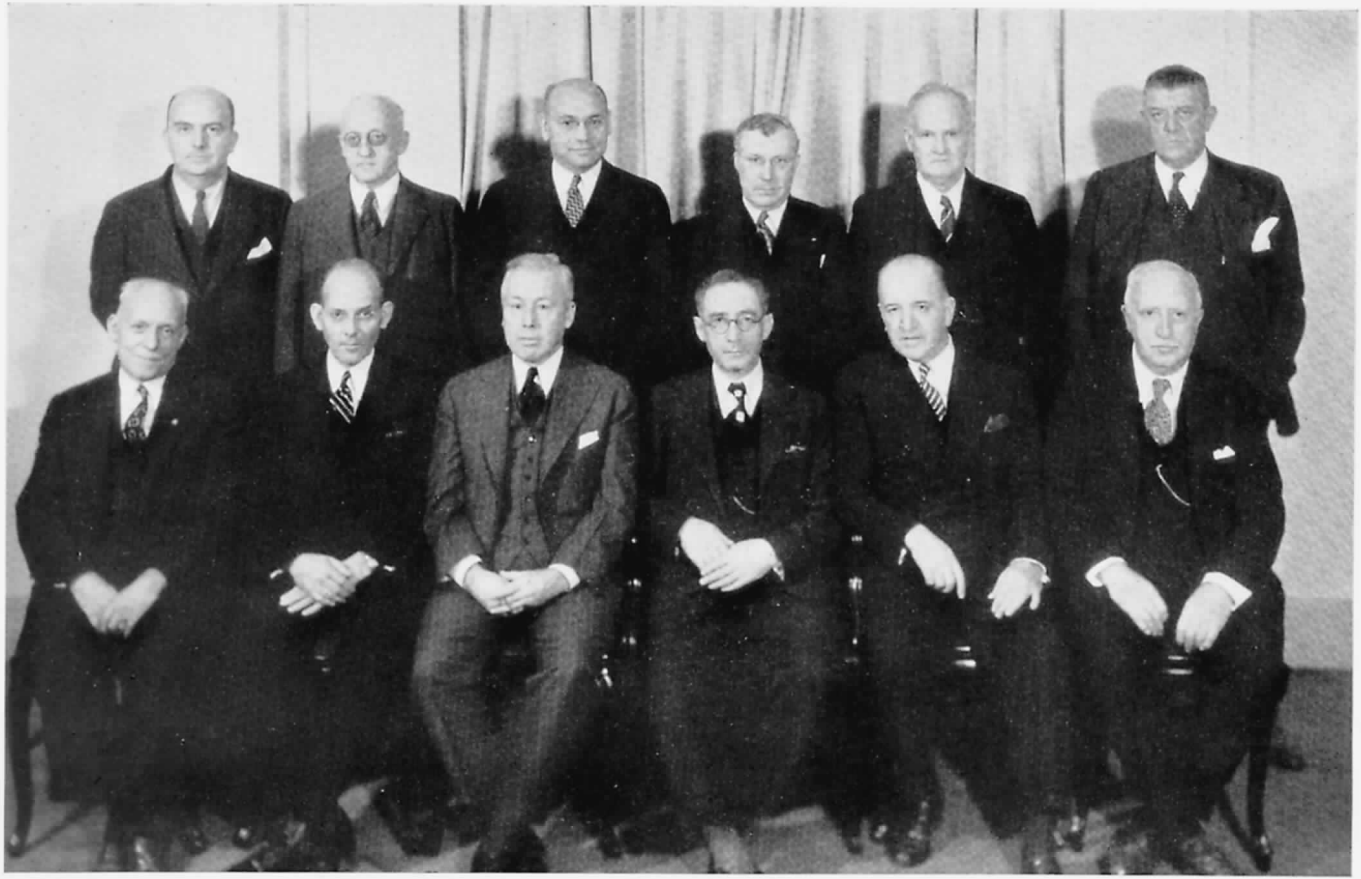
"Experience should be a springboard under our feet, and not a ball and chain at our ankles."

—*General Gamelin.*

(*Quoted from "The New Yorker"*)

"Your hearts are, if you leave them unstirred, as tombs in which a God lies buried."

—*Ruskin.*



CHARTER MEMBERS PRESENT AT
TWENTY-FIFTH ANNIVERSARY MEETING OF THE CASUALTY ACTUARIAL SOCIETY, HOTEL BILTMORE, NOVEMBER 16, 1939

LEFT TO RIGHT	1	2	3	4	5	6
STANDING	WINFIELD W. GREENE	WILLIAM N. MAGOUN	GUSTAV F. MICHELBACHER	FRANK R. MULLANEY	ALBERT W. WHITNEY	LEE J. WOLFE
SEATED	LEWIS A. NICHOLAS	EVERETT S. FALLON	BENEDICT D. FLYNN	LEON S. SENIOR	WILLIAM J. GRAHAM	CHARLES HUGHES

VOL. XXVI, PART I NO. 53

PROCEEDINGS

NOVEMBER 16, 1939

THE FIRST TWENTY-FIVE YEARS

PRESIDENTIAL ADDRESS BY FRANCIS S. PERRYMAN

This is the occasion of the celebration of the Twenty-Fifth Anniversary of the Society, and consequently this address rather inevitably will fall into the category of a review of the quarter of a century that has elapsed since that memorable day in November, 1914, when forty of our founder members met together at the first meeting of this Society. However, the historical part of the review will be brief. I am not attempting to give a history of the period or of the Society, for in any case I am not the one to write such a chronicle; there are many here who have played a more active part over the whole period and who are much more competent to undertake the role of historian. I will, nevertheless, ask you to bear with me while I rapidly scan the twenty-five years.

First it is worthy of more than passing notice that the quarter century in question extends from the outbreak of the first World War to what may well prove to be the outbreak of the second. It is, of course, a coincidence of a purely accidental kind that the first war should have broken out just when our founders had decided the time was ripe to launch our Society and that the second war should come almost exactly twenty-five years later and that we consider twenty-five is a nice round number of years and worth celebrating. What needs serious concern, however, is that while the lapse of twenty-five years is, for a Society such as ours, a good time at which to take stock and while twenty-five years is a good slice out of the active business life of most of us as individuals, yet it is an impossibly short time to elapse between world wars. By impossibly short time I mean a time so short that it is impossible for our civilization to stand the strain of having these upheavals at the rate of four a century, with the intervening periods of turmoil and uncertainty. If civilized man does not find a way

to avoid having a world war every twenty-five years, he will soon cease to be civilized man. This is not an actuarial conclusion but a statement of common sense.

The twenty-five years of our Society's life can be divided mathematically into five periods of five years each and, as it happens, these five-year periods form a rather suitable division of the period from the historical point of view. The first five years were from 1914 to 1919, marking the duration of the World War and the making of the peace. As respects our Society it marked the beginning of modern casualty insurance and casualty actuarial science. During this period there was a great, almost unbelievable, increase in the volume of casualty insurance. Compensation insurance was introduced quite widely in this country during the period, and the automobile business started on its phenomenal growth.

The second five years, from 1919 to 1924, covers the period of post-war depression and recovery and the beginning of the "New Era" that was hailed as the inauguration of a new and better world for us to live in. The period, as far as casualty insurance is concerned, was marked by continued growth, with only a temporary set-back on account of the 1921 depression. During this time casualty insurance settled down somewhat, and the five years saw the setting up of many of our major rating organizations in the form that they still have to-day.

The third five-year period, 1924 to 1929, covers the "New Era" in full flower. Despite the gloomy and scarcely heeded mutterings of a few critics, American business continued to go ahead and go ahead, and casualty insurance followed in its wake. The volume of casualty insurance reached at the end of the period was a peak that was not going to be surpassed for many years thereafter. Of course, looking back upon this time from the vantage point of 10 or 15 years later it is easy to see the folly of much that was then done and to realize that during this "New Era" were sown the seeds of much future trouble; but at the time everything looked quite rosy. From the particular viewpoint of casualty insurance the period included the inauguration of the "permanent rate making program" for compensation insurance and the introduction of further refinements in casualty underwriting and rate making.

The fourth five-year period, 1929 to 1934, covers the great depression. Casualty insurance was not of course immune to the

effects of the storm and many of its worst crises arose during the period. Compensation insurance, with its intimate connections with general business, became one of the most serious of problems, and the "permanent" rate-making program of the previous period had to be hastily amended. The spectre of occupational diseases arose to add one more to the list of threatening disasters. Other aspects of casualty business that caused the gravest concern to the stronger companies and pushed some of the weak ones over the brink arose out of the terrific drop in investment values; a direct threat to all companies, a collateral threat also to those which had undertaken great commitments on guarantee bonds, such as those covering mortgages and note issues. The history of the period, of course, is solely one of depression, of disaster and of the measures taken to stem the tide.

The fifth period, 1934-1939, is characterized by the recovery from the sorry state in which the country found itself at the end of the previous period. As to the extent and efficacy of this recovery opinions may differ, but certainly the casualty business is in a much more healthy state than it was five years ago. From our point of view the period is marked by the effects of the recovery and by the renewal and intensification of competition between the different parties in our field.

No account of the quarter century would be complete without some more specific reference to the almost unbelievable growth of casualty insurance during this time. It is not easy nor is it necessary to find comprehensive figures dealing with all the classes of insurance coming within the purview of our Society. Most of these are written by private insurance carriers of several varieties, usually either so called life or casualty or surety companies, but in addition a certain portion is handled by public or semi-public carriers and some kinds are considered to be more or less direct governmental functions. For my purpose, a sufficient index is the total writings of all casualty and surety companies doing business in New York State—the figures while not covering the whole field comprise enough of it to illustrate the gigantic growth. In 1914 the total countrywide writings of all casualty and surety carriers entered in New York totaled $139,000,000. By 1919 this had jumped up nearly 150% to $329,000,000; by 1924 the writings had reached $541,000,000; and by 1929 the total attained

the colossal figure of $811,000,000. From this there was a considerable recession—in 1933 the writings were only $581,000,000 but thereafter the volume of business increased again to $856,000,000 in 1937. In 1938 the volume was approximately the same, $849,000,000. It would appear that allowing for the writings not included in these figures that we service a billion dollar a year business. Contrast this with the 1914 figures.

In my brief outline of the background of the last few years I have deliberately, so far, omitted any reference to general world conditions, to the world-wide unrest and discontent, to the growth of new and subversive ideas of human conduct particularly in certain countries, accompanied by the sporadic outbreak of open hostilities in different parts of the world. All this, viewed from our domestic scene, has furnished an ominous and sinister background to this nation's efforts to achieve "recovery" and has finally culminated in a major war the eventual outcome and consequences of which we cannot forecast.

This brief survey of the history of the twenty-five years being now finished, I want to discuss for a few minutes what the Society has done and how it has done it. I do not intend to give a critical account of our technical achievements—these can speak for themselves. Rather, I want to evaluate the efficiency in our accomplishments, as such and in relation to our Society's expressed aims, and to do this along the lines of attempting to estimate the worth of the Society to its members, to the business of casualty and social insurance, and to the nation at large.

How far have we succeeded in fulfilling our avowed purposes as a Society? How have we done what we have done? And can we fairly say that the Society, in doing what it has done and in the methods employed, has been and is as useful a unit of our civilization as it could and should be?

First then we will look to see what success the Society has had in the way of fulfilling its aims. These aims are, and have been from the beginning:—"the promotion of actuarial and statistical science as applied to casualty and social insurance by means of personal intercourse, the presentation and discussion of appropriate papers, the collection of a library and such other means as may be found desirable." The second Article of the Constitution, entitled "Object," has never been amended.

Dr. Rubinow, in his letter to the Society on the occasion of its twentieth anniversary five years ago, said: "I have no doubt in my own mind that it was because of the Casualty Actuarial Society that casualty insurance has become so very much more scientific in this country than it had been, for instance, in England, and the value of the work of these twenty years, the value of the twenty volumes of publications accrued not only to the insurance carriers, but what is very much more important to the American people, for scientific insurance means insurance on a basis equitable to the insured as well as to the insurer and useful to the people at large." These words are as true now as then. There is a good deal more work being done abroad in respect of casualty actuarial subjects than most of us realize. A perusal of the actuarial literature of countries like Italy, France and Germany will show this. However, most of this work abroad is along the lines of theoretical studies by persons not always actively engaged in the business of insurance, and the practical side of casualty insurance and casualty actuarial work in those and other foreign countries is still very primitive as compared with the work done in this country. I am in the service of an organization with interests in many parts of the world, and so I have more opportunities than many of you to realize this; it happens that several times recently I have been impressed by the statements of persons connected with our interests abroad as to the comparatively advanced stage of casualty practices in this country as contrasted with the rough-and-ready methods used abroad. These statements particularly apply to what we know as the actuarial aspects of our business—that is, those phases of our business where the influence of the members of this society has been most felt. One of the outstanding characteristics of this young and vigorous country has always been its willingness to experiment with new methods and ideas. Perhaps sometimes it has rushed too quickly and none too wisely into some new development, but corrections and improvements have followed. This is the way to make progress—it cannot be made by standing still. The casualty insurance business has exemplified this urge for rapid progress, and to say that the Casualty Actuarial Society has reflected this is an understatement. I would rather put it that the Society has fostered and promoted a lot of this forward-looking activity. This does not mean to say that the Society has done as

much towards the aims of promoting casualty and social insurance as may have been wished by the founders. The truth is that our efforts have been spotty in the sense that some branches of insurance have received far more attention than others; certainly compensation insurance has received from us much more attention than any other kind of insurance and other forms of social insurance have in many ways been sadly neglected. No doubt this will ultimately be corrected, particularly as the nation's views on social insurance are considerably different from what they were twenty-five years ago, have changed radically in the last few years and have not yet finished changing. In my address to the Society last May I expressed my views as to the function of the Society and its members in respect of these social insurance problems, and so I will not repeat them now.

Next let us consider *how* the Society has functioned. The quotation from the Constitution given above mentions some methods to be followed—personal intercourse, the presentation and discussion of appropriate papers, the collection of a library and such other means as may be found desirable. Taking first the more formal aspects,—"the presentation and discussion of appropriate papers." During the twenty-five years we have had papers of varying kinds and varying merits and on many different subjects. We have had formal discussion of these and we have added many informal discussions of these and other subjects. These articles have received publicity by publication in our *Proceedings* and in the insurance press. All this has been very valuable to the insurance business and therefore to the whole community. What is contained in the pages of the twenty-five volumes of the *Proceedings of the Casualty Actuarial Society* reflects these formal contributions to (as Rubinow puts it in the sentence just quoted) "not only the insurance carriers but what is much more important the American people." As to the library, we certainly have a library, but whether what we have is in an adequate fulfilment of the conception the founders of our Society had is a question that I rather think the founders would answer in the negative. Our library should be much more than a place where our students can get access to certain prescribed textbooks;—I believe a larger scope is both desirable and possible.

The more formal contributions of the Society to the building up

and improvement of casualty and social insurance, that I have just been talking about, form the background or framework of our Casualty Actuarial Society. However, despite the extreme importance of such formal material—important as it is and difficult as it is to get sometimes (as can be readily testified by those whose lot it has been to secure such material for inclusion in our written records)—it is not everything, as our Constitution definitely recognizes by calling for personal intercourse, that intangible thing which, after all, makes the wheels of the world go round. Those whose gifts do not run to the ready production of formal papers can take some comfort from this other method of achieving our aims as a body of casualty actuaries. Many of our members, past and present, whose more formal contributions have not been large, have nevertheless conferred and are conferring benefits to our casualty actuarial science that are actually just as valuable, and in many cases more valuable than the writing of formal papers, and this they have done and are doing by the means of personal intercourse. What I have personally valued and cherished, and still do, has been above all the opportunity of meeting the other actuaries in my own chosen field. When fifteen years ago I came into casualty insurance (from life insurance in another land) I was very fortunate to find our Society flourishing in its tenth year. Although my duties brought me into contact with many other casualty actuaries, I found that the Society gave me a much wider opportunity to get to know you all. This personal intercourse is the flesh and blood of our Casualty Actuarial Society, just as the more formal part of our proceedings is the framework, and by means of it our Society has accomplished great things.

This analogy of our formal work as the framework, and our personal intercourse as the flesh and blood, like all analogies cannot be pushed too far; but we can safely say that a structure merely of framework and of flesh and blood could not be a living organization; something else is needed, the spark of life. If our Society is to be a living organization it must live and survive. This means, it must undertake the training and educating of new and younger members to take over from the present membership as time inexorably marches on. This question of education, while not specifically mentioned in the objects of the Society as quoted above,

is to be implicitly understood. Our Society is a scientific one; it was formed to act as an agency for the dissemination of knowledge pertinent to our field and this surely includes the function of promoting the education of casualty actuaries—or in other words, the training of successors to carry on our scientific work. How have we made out in this matter of education? Here, of course, I am not trying to evaluate the tangible, but rather the intangible. I am not looking to see how many students have sat for our examinations and how many have passed, but I am seeking to find if we have trained casualty actuaries and built up a society that is a living and continuing organism. Yes, we hold examinations and we have a syllabus and we have a course of reading and we have a library. We have examined a large number of candidates and have passed many of them. Our formal arrangements for education are not so elaborate as those of some of the other actuarial societies, but we have had a steady stream of new members coming in, and, I believe, properly trained new members. Whether we have had as many such new members as we should is a different question. Believing as I do that the scope of actuarial work should be enlarged, and that our Society has not completely covered every corner of its field, I suppose my conclusion must be that we should, and doubtless would have obtained more such trained new members if our Society's activities had extended more completely over the whole field of casualty and social insurance. Nevertheless, within our field as we have developed it (or should I say cultivated it) we have reaped a good crop, and with some notable exceptions we have in our membership very nearly all those who should be with us. And what have we to report concerning the quality of our crop? Are we training the successors of men like Rubinow, J. D. Craig, Woodward, Flynn, Mowbray, Ryan, Leslie, Michelbacher, Perkins, Moore, Tarbell, Dorweiler, Green and Senior? (Here let me say I did not select the men to appear on this list—you did, for it is a list of the past presidents of our Society). Are we training men who like these and many others can face whatever they may be called upon to tackle and who can achieve the same measure of success that they have? I believe that the answer is "yes," for as I take stock of the younger members of our Society I am quite encouraged. Our Society is showing no sign of inability to develop suitable manpower. I ascribe this,

not solely to our formal program of education, but in a large measure to that more intangible personal intercourse to which once again I attribute a large portion of the credit for the success of our Society.

Does this all mean that the objects of the Society have been successfully achieved in the twenty-five years? It does in the sense that the Society has made great progress and has been of great help to those phases of our social structure that it was formed to aid. But of course we have not been 100% successful; nothing human ever is. There are, as I have indicated, many directions in which our Casualty Actuarial Society has not progressed as much as it might, and there are some directions in which seemingly no progress has been made. The larger part of our efforts, at any rate our "formal" efforts, seem to have been directed towards compensation insurance and not so much attention has been given to many of the other kinds of insurance usually considered as belonging to the field of Casualty and Social Insurance.

In the less formal parts of the work of our Society, as typified by the "personal intercourse" I have spoken of, the Society's success has, I consider, been rather greater, although this is not uniformly true as regards our entire membership, many of whom are not particularly active in our corporate work. The reasons for this are not at all obscure: the membership of our Society is not as homogeneous as that of the other actuarial societies. Many of our members are life actuaries whose present interests in our casualty aims is not very great. Again, another large section of our membership consists of underwriters or executives of casualty companies whose direct interest in the purely actuarial aspects of the business is not as great as it may have been at one time. That leaves a somewhat reduced proportion of our membership with a continuing active interest in casualty actuarial work. For reasons such as these, it is not possible to get all of our members to share equally in our endeavors to carry out the objects of our Society, and it may therefore have seemed to some that the actual work of running our Society has been not so widely spread as it might have been. This does not mean that those who do the work object to doing it, but it does help to explain why the actual running of the Society has apparently been confined to what, while it is a

large majority, is still a somewhat restricted proportion of our membership.

Now the danger of this state of affairs is, that if most of the work of the Society falls on those whose chief immediate interest is, say, compensation insurance, then inevitably the Society tends to interest itself predominantly in compensation insurance and in refining this to the *n*th degree, so that other kinds of social insurance, that possibly should be studied and developed, remain unduly neglected. No doubt ultimately this will be corrected, if public interest calls for the neglected to be developed. The Society should try to avoid the over-emphasis of some parts of its field and the neglect of others, and the way to do this is to bring within its membership all of the workers in the various parts of its field, and to place the running of the Society on the broadest possible cross-section of its membership. Your past and present officers and your Council continually have these considerations in mind and have, I know, been ever on the alert to place the running of the Society on as broad a base as possible. There has been no inclination or endeavor to keep the control in any one particular group. An instance of the steps taken to keep this control as broad as possible is the recent appointment of a Nominating Committee—the objective of which is, of course, not to restrict the field for candidates for office but to extend it.

I think that we can say, then, that we have made a good start during the first quarter of a century towards attaining the objects of the Society. On the formal side we have done a lot but a great deal remains to be done, and probably always will so remain. On the more informal side, meaning by this the building up of a capable group of Casualty Actuaries, we have done, I should judge, even more—and perhaps this is actually the most important thing we have done or could have done. For there is no assurance of the perpetuation in its present form of our system of casualty and social insurance or indeed of our whole insurance system. For insurance, as we know it, is bound up with our economic system of capitalism. This capitalism, like any other living organism, cannot and does not stand still, and we seem to be in an era of great changes. Therefore, what is important is that we have a systematized actuarial science and a body of actuaries capable of ready adaptation so as to be able to take care of any changes

that may come in our social organization. Let me repeat—what is important is that the principles of the actuarial science that we have set out to establish should be built on a sound basis, and, above all, that we should have developed and trained a body of actuaries capable of applying these scientific principles to whatever changes this country finds it desirable to make. What these changes may be is not for me to discuss here, although it does seem that they must tend towards the simplification and extension of insurance. I cannot believe that social insurance will not be considerably extended in scope with the passing of the years, and further I cannot avoid the belief that some of the forms of insurance will be considerably simplified. Those kinds of insurances with which we have had most particularly to deal have been growing in complexity during the life of our Society, and the time is not far distant when some broader generalizations and simplifications will have to be made. However, what the changes may be is not the point I am considering at the moment; the point is, whether our Society, that is to say our members, are capable of dealing with whatever changes are coming. I think the answer is undoubtedly "yes," and that implies that our Society's work has not been unsuccessful.

CONTINGENCY LOADING— NEW YORK WORKMEN'S COMPENSATION INSURANCE

BY

JAMES M. CAHILL

The purpose of this paper is to outline the changes which were introduced this year in the method of determining the contingency loading for workmen's compensation insurance in New York State. A detailed explanation of the revised procedure will be of interest to those who wish to keep up-to-date on the ratemaking formula.

Because of recurring underwriting losses in the compensation insurance business, the ratemaking program was revised in 1934 to include provision for a contingency loading in the rate structure. The purpose of the contingency loading is to ensure that, over a period of years, there will be neither an underwriting loss nor an underwriting profit on the business of each state.

Papers* presented by Mr. Leon S. Senior and Mr. Francis S. Perryman at the November 24, 1933 meeting of the Society outlined new ideas as respects ratemaking procedure, and these suggestions played a part in the development of the program finally adopted. A complete outline of the 1934 compensation ratemaking program is given in pages 383-388 of the Current Notes section of Volume XX of the *Proceedings*.

New York was the first state to give consideration to amending the ratemaking program to include provision for a contingency loading. At the May 23, 1934 meeting of the Governing Committee of the Compensation Insurance Rating Board, a resolution was adopted which included the following section dealing with the contingency loading:

> "(2) In accordance with the principle that rates shall be adequate and reasonable to meet all losses over a period of years, rates as finally calculated shall contain a basic contingency loading of 2.5 points which shall vary according to the following conditions:
>
> (a) Beginning with calendar year 1933 and including all subsequent calendar years, a record shall be kept of

* "A Realistic Plan for Determining Compensation Insurance Rate Levels" and "Rate Levels for Workmen's Compensation Premiums" respectively.

the accumulated profit or loss resulting from a realized loss ratio less than or greater than the permissible.

(b) The basic contingency loading of 2.5 points shall vary (rounded off to the nearest half point) with the accumulated profit or loss thus determined from a minimum of zero when the accumulated profit is equal to 2.5% of the earned premium of the latest *calendar* year, to a maximum of 5.0 points when the accumulated loss is equal to 2.5% or more of the earned premium of the latest *calendar* year."

The Superintendent of Insurance gave approval to this provision effective with the July 1, 1934 rate revision.

A similar resolution as respects the contingency loading provision was adopted at the December 1934 meeting of the National Convention of Insurance Commissioners. There was added to this resolution, however, the following paragraph which indicated that the results produced should be subjected to review after a reasonable time:

> "It is expected that the accumulation shall not continue indefinitely and that it shall be terminated as to old balances after a reasonable period, viz. 5 years."

The ratemaking program approved for the July 1, 1934 New York rate revision was employed at the annual rate revisions thereafter through July 1, 1938. A contingency loading of 5.0 points was required at each revision date on the basis of the following experience compiled from the Casualty Experience Exhibit:

TABLE 1

NEW YORK

EXHIBIT OF CALENDAR YEAR UNDERWRITING RESULTS
FOR COMPUTATION OF CONTINGENCY LOADING

Cal. Year	Earned Premium	Portion Available for Losses 60% × (2)	Incurred Losses	Underwriting Profit (+) or Loss (—)		Cumulative Profit (+) or Loss (—)		Indicated Contingency Loading	
				Amount (3) — (4)	% of Cal. Yr. Earned Prem. (5) ÷ (2)	Amount	% of Cal. Yr. Earned Prem. (7) ÷ (2)	Points	Rate Revision Date
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1933	$39,456,267	$23,673,760	$27,889,409	—$4,215,649	—10.7%	—$4,215,649	—10.7%	5.0	7-1-34
1934	46,111,249	27,666,749	31,087,142	— 3,420,393	— 7.4	— 7,636,042	—16.6	5.0	7-1-35
1935	57,203,959	34,322,375	36,702,072	— 2,379,697	— 4.2	—10,015,739	—17.5	5.0	7-1-36
1936	68,132,814	40,879,689	41,984,901	— 1,105,212	— 1.6	—11,120,951	—16.3	5.0	7-1-37
1937	80,853,743	48,512,246	47,629,184	+ 883,062	+ 1.1	—10,237,889	—12.7	5.0	7-1-38

In approving the July 1, 1938 rate revision, the Superintendent of Insurance specified that a careful study should be made of the general ratemaking procedure with respect to the desirability of tapering off the effects of the contingency factor but preserving, however, the general purpose of the plan. Such a survey would be in accordance with the tacit understanding at the time the program was adopted by the National Convention that the method would be reviewed after a period of five years to determine whether any change should be made in the manner of calculating the contingency loading.

In the ensuing study made by the New York Board, consideration was given to the following important phases of this problem:

(1) Whether it is logical to terminate old balances after a reasonable period of years.
(2) An amendment of the method which would base the calculation of the calendar year underwriting profit or loss on the experience of only a limited period of recent policy years as, for example, the latest five or seven.
(3) The effect of interest reserves established by certain carriers.
(4) The effect of interest discount for tabular cases. (Tabular cases are long term cases for which the outstanding losses are evaluated by means of tables such as those contained in Special Bulletin 190 published by the New York Department of Labor. Such tables incorporate the elements of interest, mortality and remarriage in accordance with actuarial formulas.)
(5) The permissible loss ratio to be employed in computing the underwriting profit or loss.

Each of these items was analyzed as follows:

(1) *Whether It Is Logical to Terminate Old Balances after a Reasonable Period of Years*

The principle underlying the contingency loading is that the rates shall be adequate and reasonable to meet all losses over a period of years. The purpose has been to provide an adequate rate level since calendar year 1933. The substantial underwriting losses incurred by the carriers prior to 1933 are to be disregarded. Beginning with 1933, however, it is the intent that the provision for losses in the rate structure over a period of years shall equal the incurred losses.

To modify the contingency formula to provide for the termination of old balances would destroy the underlying principle of the contingency loading. Furthermore, whereas supervising authorities and policyholders might not object to the termination of old balances where a loss was shown, it is almost certain that they would object to the elimination of old balances which showed a profit for the older calendar years.

It was concluded that it would be unsound to modify the contingency loading formula in this manner, since such a change would be impracticable in application and would tend to destroy the basic principle of the contingency loading.

(2) *An Amendment of the Method Which Would Base the Calculation of the Calendar Year Underwriting Profit or Loss on the Experience of Only a Limited Period of Recent Policy Years as, for Example, the Latest Five or Seven*

Consideration was given to using the experience of a limited number of recent policy years to determine the underwriting result for each calendar year, thereby excluding the effect of the developments for the older policy years. It was thought that this modification might be a practical way of eliminating the effect of the periodic revaluation of tabular cases. There was also the question as to whether it is desirable to permit developments in the claims of old policy years such as 1914, 1915, etc., to influence the underwriting results in view of the fact that the revised program did not become effective until July 1, 1934.

A test was made of the effect on the contingency loading of excluding the experience developments for policy years older than the latest five in each calendar year. This test was limited to the use of the data for only the latest five policy years in each calendar year because that period represents the maximum number of policy years for which such information is segregated in the Casualty Experience Exhibit and not because the use of a five year period has any particular significance. This test developed the following results as compared with the method which has served as the basis for the determination of the contingency loading:

TABLE 2

NEW YORK

TEST CALCULATION OF CALENDAR YEAR UNDERWRITING RESULTS
BASED ON TRANSACTIONS FOR LATEST FIVE POLICY YEARS ONLY

Calendar Year	Earned Premium	Portion Available for Losses 60% × (2)	Incurred Losses	Underwriting Profit (+) or Loss (−)		Cumulative Profit (+) or Loss (−)		Indicated Loading Contingency	
				Amount (3 − (4)	% of Cal. Yr. Earned Prem. (5) ÷ (2)	Amount	% of Cal. Yr. Earned Prem. (7) ÷ (2)	Points	Rate Revision Date
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1933	$39,472,464	$23,683,478	$25,942,872	−$2,259,394	−5.7%	−$2,259,394	−5.7%	5.0	7-1-34
1934	46,107,503	27,664,501	28,528,641	− 864,140	−1.9	− 3,123,534	−6.8	5.0	7-1-35
1935	57,187,628	34,312,577	33,222,560	+ 1,090,017	+1.9	− 2,033,517	−3.6	5.0	7-1-36
1936	68,106,958	40,864,175	38,956,868	+ 1,907,307	+2.8	− 126,210	−0.2	2.5	7-1-37
1937	80,835,091	48,501,054	44,041,031	+ 4,460,023	+5.5	+ 4,333,813	+5.4	0.0	7-1-38

TABLE 3

NEW YORK

COMPARISON OF CALENDAR YEAR TOTAL INCURRED LOSSES WITH INCURRED LOSSES FOR LATEST FIVE POLICY YEARS

Calendar Year	Total Calendar Year Incurred Losses	Calendar Year Incurred Losses for Latest 5 Policy Years	Calendar Year Incurred Losses for Prior Policy Years (2) — (3)
(1)	(2)	(3)	(4)
1933	$27,889,409	$25,942,872	$1,946,537
1934	31,087,142	28,528,641	2,558,501
1935	36,702,072	33,222,560	3,479,512
1936	41,984,901	38,956,868	3,028,033
1937	47,629,184	44,041,031	3,588,153

The exclusion of the data for the policy years prior to the latest five in each calendar year would have the effect of developing an indicated *profit* of $4,333,813 for calendar years 1933-1937 combined as compared with the *loss* of $10,237,889 developed by the existing method. This is an improvement of $14,571,702 in the indicated underwriting results. Unquestionably, however, this adjustment has the effect of excluding substantial loss developments, reflecting a change in the status of claims and reopened cases, and does not solely represent interest earnings on loss reserves.

It is illogical to exclude the effect of such actual loss developments because otherwise they will not be reflected in the rate structure. The rate level in New York is based on the indications of the experience for the latest completed policy year, developed to sixty months by means of factors derived from the experience of preceding policy years. Only in the calculation of the calendar year underwriting profit or loss is any subsequent development of the experience beyond sixty months taken into account.

It was concluded that it would be unsound to limit the underwriting profit or loss calculation to the experience of only the more recent policy years.

(3) *The Effect of Interest Reserves Established by Certain Carriers*

Certain carriers have included an interest reserve in the Casualty Experience Exhibit in order to eliminate all interest discount

from their claim reserves for long term cases normally valued on a tabular basis. By this procedure, these carriers have not taken credit for interest discount on long term cases. In effect, this means that the reserves for such cases reflect only the mortality and remarriage discount elements and exclude the effect of interest discount in determining the present value of outstanding long term cases.

It is inconsistent with the New York ratemaking procedure to consider such special interest reserves to represent incurred losses and the Actuarial Committee of the Board ruled that the specific interest reserve developments should be excluded from the incurred losses reported in the Casualty Experience Exhibit in the determination of the calendar year underwriting profit or loss. The accumulation of such developments for calendar years 1933-1938 amounted to $657,916 to be deducted from the incurred losses reported for these calendar years.

(4) *The Effect of Interest Discount for Tabular Cases*

New York has a very liberal compensation law under which benefits are payable for long periods to dependents in the case of fatal accidents and to injured employees suffering serious permanent disabilities. The New York ratemaking procedure provides that the rate level, other than the contingency element, shall be based on the loss experience developed to sixty months. At that stage, the incurred losses are equal to the paid losses to that date plus the outstanding losses as of that date. It is contemplated that the present value of tabular cases shall be determined by using an interest discount rate of 3.5% for cases with date of accident prior to July 1, 1939.

The periodic revaluation of tabular cases beyond sixty months development for a policy year has the effect of increasing the incurred losses reported in the Casualty Experience Exhibit. This occurs because the table rate of interest earnings must be realized on the loss reserve in order to provide an adequate amount to meet the current loss payments on such cases and still maintain an adequate reserve on a present value basis for future payments. The tendency of the incurred losses for the older policy years to increase is illustrated by the development of the incurred loss for the following permanent total claim:

TABLE 4

NEW YORK

ILLUSTRATION OF DEVELOPMENT OF INCURRED COMPENSATION LOSS FOR A PERMANENT TOTAL CLAIM

Assumptions: (1) July 1, 1934 date of accident in policy year 1934.
(2) $30 weekly wages; $20 weekly compensation benefit.
(3) Date of birth December 31, 1894.

Valuation Date	No. of Months Development of Policy Year	Compensation Loss			Increase in Incurred Loss	3.5% × Mean o/s Loss Reserve
		Paid	o/s	Incurred (3) + (4)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
12-31-34	12	$ 520	$19,058	$19,578	..	..
12-31-35	24	1,560	18,797	20,357	$779	..
12-31-36	36	2,600	18,530	21,130	773	..
12-31-37	48	3,640	18,254	21,894	764	..
12-31-38	60	4,680	17,971	22,651	757	..
12-31-39	72	5,720	17,680	23,400	749	$624
12-31-40	84	6,760	17,383	24,143	743	614
12-31-41	96	7,800	17,077	24,877	734	603
12-31-42	108	8,840	16,764	25,604	727	592
12-31-43	120	9,880	16,443	26,323	719	581

Since the New York ratemaking procedure contemplates that, in determining the rate level incurred loss experience, the loss payments made on tabular cases after sixty months development of a policy year shall be discounted for interest from the expected date of payment to the date representing sixty months development of a policy year, it was concluded that the calendar year results used in computing the underwriting profit or loss should be modified to eliminate the increase in the incurred losses beyond sixty months development of a policy year which results solely from the effect of the interest discount element. This adjustment eliminates the accretions to the incurred losses which result in this manner from the periodic revaluation of tabular cases for those policy years developed beyond sixty months. This adjustment was determined from a special call which was issued requesting the carriers to segregate the outstanding losses reported in the Casualty Experience Exhibit for policy years developed beyond sixty months to the following two subdivisions:

(a) Outstanding losses valued without credit for interest discount.

(b) Outstanding losses valued with credit for interest discount.

This special call developed the following results:

TABLE 5

NEW YORK

SEGREGATION OF TOTAL OUTSTANDING LOSSES (EXCLUDING INTEREST DISCOUNT RESERVES) FOR POLICY YEARS PRIOR TO LATEST FIVE

Data for Carriers Responding to Special Call

Year Ending	Policy Years	Outstanding Losses Valued without Credit for Interest Discount	Outstanding Losses Valued with Credit for Interest Discount	Total (3) + (4)	Ratio (4) ÷ (5)
(1)	(2)	(3)	(4)	(5)	(6)
12-31-32	1914-28	$2,594,825	$25,002,432	$27,597,257	90.6%
12-31-33	1914-28	1,848,204	24,108,280	25,956,484	92.9
12-31-33	1914-29	2,715,265	28,026,515	30,741,780	91.2
12-31-34	1914-29	2,441,684	28,748,892	31,190,576	92.2
12-31-34	1914-30	3,505,787	32,464,322	35,970,109	90.3
12-31-35	1914-30	2,590,801	33,543,729	36,134,530	92.8
12-31-35	1914-31	3,656,663	37,631,610	41,288,273	91.1
12-31-36	1914-31	3,164,468	39,387,419	42,551,887	92.6
12-31-36	1914-32	4,114,165	42,215,865	46,330,030	91.1
12-31-37	1914-32	4,066,738	40,948,088	45,014,826	91.0
12-31-37	1914-33	5,636,065	45,796,635	51,432,700	89.0
12-31-38	1914-33	4,272,930	42,972,305	47,245,235	91.0
Selected Ratio		..	..	..	90%

It is indicated that approximately 90% of the total outstanding losses reported in the Casualty Experience Exhibit for policy years developed beyond sixty months represents the portion valued with credit for interest discount. In the following exhibit, this ratio was employed for each calendar year to determine the mean outstanding loss reserve for cases valued with credit for interest discount for policy years developed beyond sixty months. The adjustment by calendar year to reflect the effect of interest discount was calculated by taking 3.5% of this mean loss reserve.

TABLE 6

NEW YORK

ADJUSTMENT FOR INTEREST DISCOUNT ON OUTSTANDING LOSSES VALUED ON A PRESENT VALUE BASIS FOR POLICY YEARS DEVELOPED BEYOND 60 MONTHS

Data for All Carriers

Calendar Year	Total Outstanding Losses (Excl. Interest Discount Reserves) Policy Years Prior to Latest Five		Ratio Representing Portion Valued with Credit for Int. Discount	Estimated Average o/s Losses Valued with Credit for Interest Discount (4) × (2) + (3) / 2	Adjustment for Int. Discount on o/s Losses Valued on a Present Value Basis for Policy Years Developed Beyond 60 Months 3.5% × (5)
	As of Year End	As of Preceding Year End			
(1)	(2)	(3)	(4)	(5)	(6)
1933	$35,149,918	$37,419,739	.90	$32,656,346	$1,142,972
1934	38,051,424	41,480,436	.90	35,789,337	1,252,627
1935	42,972,261	44,784,874	.90	39,490,711	1,382,175
1936	46,458,142	48,681,785	.90	42,812,967	1,498,454
1937	48,997,513	50,664,997	.90	44,848,130	1,569,685
1938	49,690,500	54,473,853	.90	46,873,959	1,640,589
TOTAL	..	..	..	..	$8,486,502

In time, the effect of this adjustment may not be so substantial because since July 1, 1935 it has been required by the New York Compensation Law that the present value of awards made for death and certain permanent disability claims shall be paid into the Aggregate Trust Fund by the stock and mutual insurance companies.

It may be contended that the interest rate of 3.5% used in this calculation is too high in view of current interest earnings. The answer to this argument is that the interest rate used in this calculation is that used in the tables employed to determine the present value of outstanding losses. For tabular cases with date of accident after July 1, 1939, an interest discount rate of 3% will be applicable since that rate is now specified in the Compensation Law.

(5) *Permissible Loss Ratio to Be Employed in Computing Underwriting Profit or Loss*

A permissible loss ratio of 60% has previously been used in the calculation of the calendar year underwriting profit or loss for

New York. This is the correct permissible loss ratio for premiums earned prior to July 1, 1935 because the earned premiums shown in the Casualty Experience Exhibit include those earned from the application of loss and expense constants. At the July 1, 1935 rate revision, however, a factor of 1.012 was included in the rate structure effective on outstanding as well as on new and renewal business in order to include provision in the rate structure for the tax payments to the Security Funds established under the Compensation Law. Premiums earned since July 1, 1935 should, therefore, first be divided by this factor of 1.012 before using a permissible loss ratio of 60% to calculate the underwriting profit or loss.

This change was adopted in order to make the procedure consistent with the ratemaking formula.

Computation of Underwriting Result for Calendar Years 1933-1938 Combined at July 1, 1939 Rate Revision

Table 7 shows the incorporation of the following three amendments in the computation of the accumulated profit or loss for calendar years 1933-1938 combined:

(1) Exclusion of the Security Funds factor of 1.012 from premiums earned subsequent to July 1, 1935.
(2) Exclusion of interest reserve developments from incurred losses.
(3) Adjustment for effect of interest discount on tabular cases of policy years developed beyond sixty months in each calendar year.

TABLE 7

NEW YORK

EXHIBIT OF CALENDAR YEAR UNDERWRITING RESULTS
FOR COMPUTATION OF CONTINGENCY LOADING

Based on Part 4 of the Casualty Experience Exhibit

Cal. Year	Earned Premium*	Earned Prem. excl. Security Funds Factor (2) ÷ **	Incurred Losses	Cal. Year Profit (+) or Loss (−) 60% × (3) − (4)	Interest Reserve Developments	Adjustment for Interest Discount	Adjusted Cal. Year Profit (+) or Loss (−) (5) + (6) + (7)	Cumulative Adjusted Profit (+) or Loss (−)	
								Amount	% of Cal. Yr. Earned Prem. (9) ÷ (2)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1933	$ 39,456,267	$ 39,456,267	$ 27,889,409	−$4,215,649	$ ..	$1,142,972	−$3,072,677	−$3,072,677	−7.8%
1934	46,111,249	46,111,249	31,087,142	− 3,420,392	+ 668,263	1,252,627	− 1,499,502	− 4,572,179	−9.9
1935	57,203,959	56,862,782	36,702,072	− 2,584,403	+ 177,156	1,382,175	− 1,025,072	− 5,597,251	−9.8
1936	68,132,814	67,324,915	41,984,901	− 1,589,952	− 53,334	1,498,454	− 144,832	− 5,742,083	−8.4
1937	80,853,743	79,895,003	47,629,184	+ 307,818	− 68,827	1,569,685	+ 1,808,676	− 3,933,407	−4.9
1938	78,205,538	77,278,200	40,821,292	+ 5,545,628	− 65,342	1,640,589	+ 7,120,875	+ 3,187,468	+4.1
TOTAL	$369,963,570	$366,928,416	$226,114,000	−$5,956,950	+$657,916	$8,486,502	+$3,187,468	..	..

NOTES: * Standard premium basis. State Fund premiums adjusted to Board level.
** Factor of 1.000 for calendar years 1933 and 1934.
Factor of 1.006 for calendar year 1935.
Factor of 1.012 for calendar years 1936, 1937 and 1938.

The effect of these three amendments is summarized in the following exhibit:

ITEM	Underwriting Profit (+) or Loss (—)
Original Method (Calendar Years 1933-1938)	—$4,135,858
Adjustment for Security Funds Factor	— 1,821,092
Adjustment for Interest Reserves	+ 657,916
Adjustment for Interest Discount	+ 8,486,502
TOTAL	+$3,187,468

If the original method of determining the contingency loading had been followed at the July 1, 1939 rate revision, an underwriting *loss* of $4,135,858 would have been developed, requiring the continuance of the full five points contingency loading. After including the three adjustments introduced, an accumulated *profit* of $3,187,468 is indicated for calendar years 1933-1938 combined.

It should be pointed out that if these modifications had been in effect since the contingency loading was introduced at the July 1, 1934 rate revision, a contingency loading of five points would have been indicated at all rate revisions prior to July 1, 1939. This is likewise the contingency loading which was determined by the previous method and adopted at the annual rate revisions from July 1, 1934 through July 1, 1938.

AMENDMENT OF CONTINGENCY LOADING RESOLUTION

In addition to the foregoing study and amendment of the method of determining the contingency loading, consideration was given to the manner of its application in the rate structure. The Actuarial Committee concluded that from the standpoint of sound business practice it is not desirable to permit the rate structure to be affected by so much as 9% at any rate revision, which results under the original formula when the contingency loading changes from its minimum to its maximum value, or vice versa. This conclusion concurs with the view advanced by the Superintendent of Insurance at the time of the July 1, 1938 rate revision that consideration should be given to tapering off the effect of the contingency factor but preserving, however, the general purpose of the plan. Recognizing the merit in the idea of tempering the

effect of the contingency loading so as not to produce too radical a fluctuation in the rate structure on account of this element, the Governing Committee upon the recommendation of the Actuarial Committee modified its original resolution on the contingency loading as follows:

"(2) In accordance with the principle that rates shall be adequate and reasonable to meet all losses over a period of years, rates as finally calculated shall contain a basic contingency loading of 2.5 points which shall vary according to the following conditions:

(a) Beginning with calendar year 1933 and including all subsequent calendar years, a record shall be kept of the accumulated profit or loss resulting from a realized loss ratio less than or greater than the permissible.

(b) The basic contingency loading of 2.5 points shall vary (rounded off to the nearest half point) with the accumulated profit or loss thus determined from a minimum of zero when the accumulated profit is equal to 2.5% of the earned premium of the latest *calendar* year, to a maximum of 5.0 points when the accumulated loss is equal to 2.5% or more of the earned premium of the latest *calendar year; provided, however, that the contingency loading shall not differ by more than 2.5 points from the contingency loading in the preceding rate revision.*"

This amendment of the contingency loading resolution is a further step in the direction of introducing stabilizing elements in the ratemaking process. The contingency loading tends to slow down rate decreases when there have been underwriting losses in the past and to slow down rate increases when there have been underwriting gains in past years.

The Superintendent of Insurance gave approval to this revised method of determining the contingency loading to apply in New York at the July 1, 1939 and subsequent rate revisions. A contingency loading of 2.5 points was therefore included in the revised rates effective July 1, 1939. This is midway between the contingency loading of 5.0 points which would have been required by the original method of computation and the contingency loading of zero points which would have been indicated by the revised method of computation if the resolution governing the application

of this element had not been amended to introduce the concept of tempering the effect of the contingency loading.

Possible Precedent for Other States

Because the compensation laws of most other states do not have such liberal benefit provisions necessitating the establishment of substantial reserves for long term cases on a tabular basis, there is probably no comparable problem elsewhere as respects giving recognition in the calendar year underwriting profit or loss calculation to the effect of interest reserves and interest discount. Likewise, only a few states have established Security Funds, thereby requiring an adjustment in the permissible loss ratio in recognition of the additional tax payments to the state. The adjustments adopted for these items this year in New York may therefore have only limited application elsewhere.

It is quite likely, however, that the proposal to terminate old balances may arise for consideration in other states. It is impossible to introduce such a change in the contingency loading calculation without destroying the underlying principle of the program

Consideration may also be given elsewhere to the desirability of modifying the original program so as to provide for tempering the effect of the contingency loading in a manner similar to that adopted in New York this year. The action taken in New York introduces a stabilizing element in the ratemaking procedure. This is a step in the right direction since it lessens the possibility of serious disturbance to the business as the result of violent fluctuation in the rates from one revision date to the next.

POLICY YEAR MODIFICATION OF LOSSES*

BY

RUSSELL P. GODDARD

The process of rate-making consists essentially of dividing losses by exposure, and then loading for expenses. Unfortunately for simplicity, it is usually necessary to modify the experience somewhat in order to anticipate conditions during the period when the rates will be used. This would not of itself cause complications, and most complications arise only because it is necessary to combine several years of experience before calculating rates. The necessity of both combining and modifying experience produces some interesting results, since experience which has been combined and then modified differs from experience which has been modified before being combined. It is the purpose of this paper to investigate these differences. The illustrations are drawn entirely from workmen's compensation insurance, though some of the principles involved would apply equally well to other lines.

The usual unit of experience for compensation rate-making purposes is the policy year, consisting of all premiums earned and losses incurred on policies issued in a given calendar year. Experience on this basis was originally taken from Schedule Z, and is now available in almost all states under the Unit Plan. Classification experience is not reported by calendar year, and it is usual to think of the policy year as the smallest unit of classification experience now available, but actually the Unit Plan has produced a smaller one, the policy month. It is possible to imagine other ways of reporting experience in order to produce even smaller units. For example, if premiums were reported by month earned and losses by month of accident, it would be possible to produce a small block of experience for each calendar month. Experience reported in this form might be of some value since it would be possible to investigate seasonal trends, and in converting losses to the present law level the accident month of each loss would be known. These possibilities are mentioned merely to point out that there are smaller units of experience than the policy year. It is the purpose of this paper to study the difference between the results obtained by modifying losses as a whole or by separate

*This paper was awarded the Fondiller prize.

parts, whether these parts be policy years, accident years or some smaller units.

Although it usually takes several years to produce a dependable volume of experience for rate-making purposes, it is customary to convert this experience separately by policy year instead of in bulk. Before considering the advantages of the two different methods, it would be well to consider the types of modification now used, and the purpose of each.

The principal reasons for modifying experience, and the methods used, are as follows:

1. To anticipate changes in losses, usually increases, as the experience matures and the ultimate cost becomes more definitely known. This is done by the so-called loss development factors, one for indemnity and one for medical, which are based on the developments of previous years.
2. To convert losses to their present cost, reflecting changes in the compensation statute. For this purpose law amendment factors are calculated, based on a comparison of the new law with the old. These factors are calculated separately for each type of injury, and for each policy year.
3. To reflect fluctuations in compensation cost due to various forces such as changes in wage levels, increasing or decreasing industrial activity, and technological improvements, to mention but a few. These and other factors combine to form the aleatory element in compensation ratemaking. Thus, even after the experience has been converted by the loss development and law amendment factors previously mentioned, and the premiums have been adjusted to a common rate level, there is usually considerable difference in loss ratio by policy year. "Loss projection factors" are used to make the loss ratio of each year of the experience period equal to the loss ratio of some period which is supposed to reflect future conditions. The loss ratio selected is usually that of the latest policy year for medical, and the average of the two or three latest years for indemnity. At one time the medical loss ratio was increasing so steadily that it was possible to calculate it for two and a half years in the future. The policy years selected as the basis for the loss projection factors are usually known collectively as the rate level period.

From the above it may be seen that the loss projection factors are the most important from the point of view of the over-all loss ratio. The loss development and law amendment factors are

important only in that they help determine the loss ratio of the rate-level period. For other years they have no effect on the over-all rate level since the loss projection factors bring all losses to the same level.

PROJECTION OF LOSSES TO DESIRED RATE LEVEL:

The loss projection factors might better be called trend factors, since if there is no easily recognizable upward or downward trend in loss ratio there is no necessity for them. Their purpose is to make the rates reflect the conditions prevailing during the later years of the five-year period, on the assumption that these conditions are different from those in the earlier years, and that they will still prevail during the year when the rates will be in effect.

It has not been definitely proved that the trend theory is altogether valid. There is some ground for believing that compensation costs, (exclusive of arbitrary changes due to law amendment) follow an up-and-down cycle, and that a period of rising costs is followed by one of decreasing costs. The discussion of this point is outside the province of this paper, but the view held by many is that these periods of rising or falling costs last long enough so that at any given time it is safe to assume that any discernible trend in the experience period will be continued at least until the rates are made effective.

The loss projection factors are calculated separately for each industry group, since it has been found that there is usually considerable variation in trend between groups. The division of classes into groups is sometimes rather arbitrary, and it often happens that the trend of an individual class within an industry group is different from that of the group as a whole. Such trends for individual classes are likely to be unreliable, as pointed out by Greene and Roeber in *Proceedings,* XII. In their paper on the "Permanent" Rate Making Method they state (page 261), that "investigation has demonstrated that the 'trend' of the pure premium for the individual class cannot generally be regarded as significant."

In any event, it is worth while to study different methods of loss projection and observe the effect on the individual classes within an industry group as compared with the effect on the group as a

whole. The following theoretical discussion may help in understanding the specific problem in question.

Let $\frac{a_1, a_2, a_3,}{b_1 \ b_2 \ b_3}$ etc. be a series of unequal fractions with positive denominators, such that

$$\frac{a_1}{b_1} > \frac{a_2}{b_2} > \frac{a_3}{b_3} > \text{————} > \frac{a_n}{b_n}$$

and let $p_1 < p_2 < p_3 < p_4$ ———— $< p_n$

p being positive in every case.

Then $\frac{p_1 a_1 + p_2 a_2}{p_1 b_1 + p_2 b_2} > \frac{a_1 + a_2}{b_1 + b_2}$

since, by cross-multiplication

$$p_1 a_1 b_1 + p_1 a_1 b_2 + p_2 a_2 b_1 + p_2 a_2 b_2$$

is less than $\quad p_1 a_1 b_1 + p_2 a_1 b_2 + p_1 a_2 b_1 + p_2 a_2 b_2$

transposing $\quad p_1 (a_1 b_2 - a_2 b_1) < p_2 (a_1 b_2 - a_2 b_1)$

which is true because

$$a_1 b_2 - a_2 b_1 \text{ is a positive quantity}$$

and more generally

$$\frac{p_1 a_1 + p_2 a_2 + p_3 a_3 \cdots\cdots + p_n a_n}{p_1 b_1 + p_2 b_2 + p_3 b_3 \cdots\cdots + p_n b_n} < \frac{a_1 + a_2 + a_3 \cdots\cdots + a_n}{b_1 + b_2 + b_3 \cdots\cdots + b_n}$$

Similarly, it may be shown that

$$\frac{p_1 a_n + p_2 a_{n-1} \cdots\cdots + p_{n-1} a_2 + p_n a_1}{p_1 b_n + p_2 b_{n-1} \cdots\cdots + p_{n-1} b_2 + p_n b_1} > \frac{a_1 + a_2 + a_3 \cdots\cdots + a_n}{b_1 + b_2 + b_3 \cdots\cdots + b_n}$$

In the first instance what might be called the weighted average fraction is smaller than the unweighted fraction, because the smallest weights have been coupled with the largest fractions; in the second case the weighted fraction is larger because the largest weights are used with the largest fractions.

The application of the above proposition to the specific case of loss projection may readily be seen. Assume that the losses of a given industry group and of a class within the group have been as follows, the premium volume in each case remaining constant.

Policy Year	Actual Losses	
	Industry Group	Individual Class
1	b_1	$p_1\, b_1$
2	b_2	$p_2\, b_2$
3	b_3	$p_3\, b_3$
4	b_4	$p_4\, b_4$
5	b_5	$p_5\, b_5$
Total	$(b_1+b_2+b_3+b_4+b_5)$	$(p_1b_1+p_2b_2+p_3b_3+p_4b_4+p_5b_5)$

Where $b_1 < b_2 < b_3 < b_4 < b_5$
and $p_1 < p_2 < p_3 < p_4 < p_5$

It will be seen that there is an upward trend in loss ratio for the industry group, but that the upward trend in the individual class is greater.

It is desired to project losses to the level of the latest year, so the following projection factors are calculated.

Policy Year	Projection Factor
1	$b_5 \div b_1$
2	$b_5 \div b_2$
3	$b_5 \div b_3$
4	$b_5 \div b_4$
5	1

After projection by the above factors, the total losses for the industry group are $5\, b_5$ and for the individual class

$$(b_5)(p_1 + p_2 + p_3 + p_4 + p_5).$$

The average projection for the five year period, obtained by dividing the total projected losses by the total actual losses, is

$$\frac{p_1\, b_5 + p_2\, b_5 + p_3\, b_5 + p_4\, b_4 + p_5\, b_5}{p_1\, b_1 + p_2\, b_2 + p_3\, b_3 + p_4\, b_5 + p_5\, b_5} \qquad \frac{b_5 + b_5 + b_5 + b_5 + b_5}{b_1 + b_2 + b_3 + b_4 + b_5}$$

Individual Class — Industry Group

From the previous discussion, it is apparent that the left-hand expression is less than the right. In other words, the individual class, with its greater upward trend, has received less increase in losses by projection than the industry group as a whole. This results because its lowest loss ratios are in the earlier years, for which higher projection factors are used.

On the other hand, if there had been a downward trend in the industry group and a still greater downward trend in the individual class, the individual class would have received a greater decrease in losses than the industry group as a whole. This is because its largest losses are in the earlier years, and give effect to the projection factors providing the greatest decrease. It is therefore plain that the greatest increases or decreases are felt by those classes which have relatively large losses in the early years. This produces relatively low rates for classes with a downward trend when the general trend of all classes is downward, but fails to produce high rates for classes with an upward trend when the general trend turns upward.

The following numerical examples may serve to give a clearer idea of the way loss projection by policy year operates in the actual rate-making process.

Assume that the projection factors for the period, based on the loss ratios of the industry group as a whole, are as follows:

Policy Year	Projection Factor
1	1.40
2	1.30
3	1.20
4	1.10
5	1.00
Average	(1.20)

The experience of the three largest classes within this group is as follows:

Class I		Class II		Class III	
Payroll*	Actual Losses	Payroll*	Actual Losses	Payroll*	Actual Losses
1,000,0	4,000	1,000,0	5,000	1,200,0	7,200
1,000,0	5,000	1,000,0	5,500	1,100,0	6,600
1,000,0	6,000	1,000,0	6,000	1,000,0	6,000
1,000,0	7,000	1,000,0	6,500	900,0	5,400
1,000,0	8,000	1,000,0	7,000	800,0	4,800
5,000,0	30,000	5,000,0	30,000	5,000,0	30,000

* 00 omitted.

It will be observed that these three classes have identical experience for the five-year period as a whole. If rates were based only on the five-year results, the same pure premium would be

assigned to each. This would be $.72, after inclusion of the average projection factor of 1.20 for the industry group.

Two of the classes, however, show an upward trend in pure premium, and if full credibility were to be given the experience of the latest year, the pure premiums assigned as the basis of rates would be: Class I $.80, Class II $.70, and Class III $.60.

By projecting the losses by policy year separately, however, the results differ somewhat from those just mentioned.

Policy Year	Projected Losses		
	Class I	Class II	Class III
1	5,600	7,000	10,080
2	6,500	7,150	8,580
3	7,200	7,200	7,200
4	7,700	7,150	5,940
5	8,000	7,000	4,800
Total	35,000	35,500	36,600
Pure Premium	.70	.71	.732

The pure premiums resulting are approximately the same as those which would have resulted from the use of the average projection factor. It will be observed, however, that the class with the most pronounced upward trend develops the lowest pure premium, and the class with no trend develops the highest pure premium. In manual rate-making, therefore, the use of separate factors tends to counteract the effect of upward trends in the individual classes rather than to recognize them. The use of such factors is justifiable only if we accept the trend theory for an industry group, while adopting the "cycle" theory for some of its component classes.

This fact should be kept in mind in any calculations involving the pure premiums underlying manual rates. Suppose, for example, an insurance company wished to compare its own experience under Class I, by policy year, with the experience of all companies. If the pure premiums for all companies were not available by policy year, it might be considered possible to calculate them by dividing the pure premium underlying the rate by the policy year projection factors. This method appears logical, because division is the reverse of multiplication, but it does not produce the desired results.

CLASS I

Policy Year	Actual Pure Premium	Projection Factor	Projected Pure Premium	Calculated "Actual" Pure Premium
	(1)	(2)	(3) (1) × (2)	(4) (.74) ÷ (2)
1	.40	1.40	.56	.50
2	.50	1.30	.65	.54
3	.60	1.20	.72	.58
4	.70	1.10	.77	.64
5	.80	1.00	.80	.70
Average			.70	

These results would be accentuated if the class in question had had a downward instead of an upward trend. If the losses of Class I, for example, had occurred in reverse order, the results would have been as follows:

Policy Year	Actual Pure Premium	Projection Factor	Projected Pure Premium	Calculated "Actual" Pure Premium
	(1)	(2)	(3) (1) × (2)	(4) (.70) ÷ (2)
1	.80	1.40	1.12	.53
2	.70	1.30	.91	.57
3	.60	1.20	.72	.62
4	.50	1.10	.55	.67
5	.40	1.00	.40	.74
Average			.74	

It is obvious from the above that it is impossible to return to the original pure premiums for each policy year by dividing the average projected pure premium by the policy year projection factors. This procedure is correct only for those classes which have the same trend in pure premium as the industry group.

CONCLUSION:

Loss projection factors are trend factors, reflecting the broad trends in compensation cost for a state as a whole or an industry group. Separate factors may be calculated for each policy year, or a single factor may be used for all years. These factors, however, do not always correctly reflect the independent trends of individual classes, and their unsuitability is accentuated if separate factors are used for each policy year. In the light of this consideration, and because of the unreliability of the experience

of individual classes, it is the author's opinion that projection of losses by policy year should be discontinued.

The "Permanent" Rate-Making Method, as given by Messrs. Roeber and Greene in *Proceedings*, XII, provided for a "Final Correction Factor" which was, among other things, a single projection factor for all policy years and all industry groups. This method of projection was in use for several years and was discontinued about 1930. It is now customary to project losses separately by policy year and industry group. In Wisconsin, however, no distinction is made between policy years or industry groups, but separate factors are used for Serious, Non-Serious and Medical losses. The distinction between different kinds of losses may well serve the same purpose as the distinction between industry groups, since the principal difference between one industry group and another lies in the distribution of losses. In some respects this may be the more satisfactory distinction, since the lines of demarcation between Serious, Non-Serious and Medical losses are much clearer than the lines separating the industry groups.

CONVERSION OF LOSSES TO PRESENT LAW LEVEL:

The purpose of law amendment factors in the present rate-making plan is to convert every loss to its cost under conditions obtaining during the period when the rates based on these losses will be effective. To do this accurately for each classification would require several conditions.

1. Each loss should be grouped by classification and by type of injury according to present definitions.
2. The estimate of total cost should be accurate for each loss. This is particularly important for the more serious losses, which are relatively infrequent and therefore produce few compensating errors.
3. The date of each loss should be known in order to determine whether it occurred before or after a change in the law.
4. The law amendment factors should be correctly calculated.

It is obvious that condition (3) is not met under the present rate-making plan which provides for separate factors by policy

year, but not by accident year. Even if experience were compiled by accident year the results would not be absolutely accurate unless the revisions in the law occurred on January 1. Ideally, it would be necessary to convert each loss separately.

Furthermore, conditions (1) and (2) are not always met. The difficulties encountered may best be illustrated by an actual example. Prior to September 19, 1935 the Massachusetts law provided the same maximum of $4,500 for both Permanent Total and Major cases. The present law retains the $4,500 maximum for Major cases, but the Permanent Total benefits have been increased to include a pension payable during disability. The average value of a Permanent Total case is now approximately $10,000. This change in the law appears to have caused a reduction in the number of claims classified as Permanent Total. According to Schedule Z, the number of Fatal, Permanent Total and Major cases, as compared with the total payroll exposure, was as follows:

Policy Year	Number of Cases			Total Payroll (In Millions)
	Fatal	P. T.	Major	
1929	342	77	815	1,504
1930	283	69	751	1,347
1931	205	72	585	1,133
1932	143	38	455	893
1933	200	17	498	950
1934	202	22	481	1,010
1935	179	13	452	1,073
1936	190	6	469	1,200

It seems not unreasonable to suppose that many of the cases listed as Permanent Total in policy years 1929 to 1931 might have been classed as Majors, and that the drop in number of P.T.'s reported between policy year 1935 and 1936 was due, at least in part, to the increase in benefits for this type of claim. It is quite probable that a re-examination of all the P.T. claims listed above in the light of the provisions of the present law would result in the classification of many of them as Majors.

Incidentally, it is of interest to note the variation in the number of all types of serious accidents during the eight years under review.

Policy Year	Total Payroll (In Millions)	Number of Serious Cases	Ratio to Payroll
1929	1,504	1,234	.820
1930	1,347	1,103	.818
1931	1,133	862	.761
1932	893	636	.712
1933	950	715	.753
1934	1,010	705	.698
1935	1,073	644	.600
1936	1,200	665	.554

It will be seen that there were approximately 8.2 serious accidents for every $10,000,000 of payroll in 1929, as against only 5.5 cases in 1936. Even after allowing for a change in distribution of payroll by industry group, it is evident that it is difficult to predict the number of serious cases for any future year for the state as a whole. How much more difficult it is to make a similar prediction for an individual class. According to the present rate-making procedure, 100% credibility is given to the state indications of an individual class for serious losses, if the payroll is large enough to produce the equivalent of 25 serious cases in five years. It would seem that such a small exposure would not always serve as a base for an accurate prediction of the number and cost of serious accidents in any one year in the future.

To return to the Permanent Total cases under discussion. In policy year 1935 there were 8 of these cases on the first report of Schedule Z, and 13 on the second report.

MASSACHUSETTS P. T. CASES POLICY YEAR 1935
INDEMNITY COST

Class Code	First Report	Second Report
0003	..	9,063
0006	..	4,500
2216	..	14,147
2286	9,540	10,091
2303	..	13,612
2413	..	13,997
2585	5,300	..
3724	23,725	23,725
5403	4,500	4,500
7500	..	11,263
8008	..	4,500
8037	..	9,776
8039	..	11,044
8233	14,366	..
8291	4,500	..
9015	4,500	..
9052	4,500	8,270
TOTAL	70,931	138,488

From an inspection of the indemnity cost of these accidents, it seems obvious that those costing exactly $4,500 (except the one incurred under class 9052) must have occurred prior to the change in benefits, while the others occurred later. The average indemnity cost of the 8 accidents listed on the first report was $8,866, as compared with an average cost of $10,653 for the 13 cases listed on the second report. A law amendment factor of 1.209 was applied to these losses at both the 1937 and 1938 revisions.

The factor 1.209 was an average factor, of course, somewhat too high for the accidents which occurred after the law revision, and too low for those which occurred before it. It would undoubtedly be possible to provide separate factors for these losses, but this would not entirely solve the problem, which is essentially one of making rates which will take care of future losses.

A comparison of the listing of Permanent Total cases on the first report of policy year 1935 with the listing on the second report reveals many changes. Further changes may be expected on the third and fourth reports, and some cases which were omitted on the second report may reappear. It is also of interest to note that, of the six classes which had P.T. cases in 1936, four classes had not had one in policy year 1935 on either the first or second report.

Under the present method of rate-making, if a class has a P.T. case in its experience, the effects of both the case itself and any amendments on this type of case are included in its rate. This is not entirely satisfactory, since the incidence of this type of case varies from one policy year to another, and from one reporting of the experience to another. It would be desirable if the effect of the law amendments, at least, could be felt not only by those classes which have had P.T. cases in the past, but also by those which will have them in the future.

On the theory that all serious accidents are similar, and that it is only chance that makes one accident produce a fatal claim, another a permanent total, and a third a case of major disability, it might be feasible to assign average values to all serious claims. This method would have its disadvantages, however, one of which would be that it would not reflect the differences in wage-scales from one class to another. Another method, somewhat simpler and more in line with present practice, would be to use a single

factor for serious losses, instead of separate factors for Fatal, Permanent Total, and Major.

The non-serious accidents, because of their greater prevalence, do not present the same problem. The distribution of these accidents between Minor and Temporary is usually the same from one class to another, so that there would be little difference between the results obtained by the use of one or two factors. Over a period of five years these differences would tend to disappear entirely. This has been confirmed by an actual test, the details of which are given below.

MASSACHUSETTS

POLICY YEARS 1932 - 1936

NON-SERIOUS (MINOR AND TEMPORARY) LOSSES

Class Code	Actual Losses	Losses on 8-30-38 Law Level*	Ratio Converted to Actual
2042	14,587	15,757	1.080
6504	11,999	12,999	1.083
2070	167,706	182,454	1.088
2039	22,055	23,976	1.087
2095	44,389	48,103	1.084

* Converted by the following factors.

Policy Year	Minor	Temporary
1932	1.010	1.095
1933	1.014	1.095
1934	1.012	1.095
1935	1.003	1.095
1936	1.000	1.089

It will be seen that the average effect of the ten amendment factors actually used was to increase losses between 8.0% and 8.8%. As a matter of fact, if an average factor of 1.084 had been used for both Minor and Temporary losses for all five policy years, the non-serious pure premiums for each of the five classes would have been exactly the same as those actually developed.

Examples such as those just cited lead the writer to suggest that law amendments be incorporated into the manual rates by factors

which are uniform for all policy years, but which are separate for the three principal types of benefit, i.e., Serious, Non-Serious and Medical. While this may seem a radical departure from present procedure, it actually represents only a combination of methods already in use under certain circumstances. For example, when law amendments are enacted at some time other than that of a regular rate revision, it is customary to incorporate the change in benefit cost into the rates by flat factors which entirely ignore the differences between kinds of injury. Furthermore, at any revision, there is no important distinction between policy years unless a previous law amendment has taken place within the experience period.

The chief theoretical disadvantage of the proposed plan is that it provides for no distinction between losses occurring before and after a change in law. As pointed out previously, the present plan distinguishes only between accidents occurring in different policy years, and this distinction is unnecessary if losses are numerous enough to be evenly distributed by accident year. This distinction is therefore of importance only to the serious losses, which are likely to be affected much more by conditions peculiar to each case. There can be no doubt that the use of one average factor covering parts of six accident years would result in a different modification of losses from that produced by five separate average factors, each covering parts of two accident years, but such differences would undoubtedly have very little effect on the final manual rates.

In considering the practical aspects of the proposed change in procedure, it is necessary to consider the results under the present method in some detail. The increases or decreases in benefit level resulting from amendments to the compensation statute are worked into the manual rates by the use of separate factors for each of six different kinds of benefit and five different policy years —a total of thirty separate factors. The use of so many different modifications arises from the fact that the actual revisions in a written statute, coupled with the American Accident Table, furnish a convenient basis for their calculation. As a matter of fact, the changes in manual rates which can be definitely attributed to statutory revisions are usually much less than the changes due to other forces affecting compensation costs. Furthermore,

other parts of the rate-making machinery, such as the off-balance correction factor and the contingency loading, often have more effect on general rate level than law amendments.

The following table shows certain data for the states (except Pennsylvania) which have had law amendments in the two years ending with January 1, 1939:

State	Date of Rate Revision	Changes in Manual Rate Level Attributable to	
		Experience	Law Amendment
Colorado	3- 1-37	.815	1.050
	5- 1-38	.939	
Connecticut	3-31-38	.864	1.004
Georgia	3-30-37	..	1.029
	3-31-38	1.005	
Idaho	3-31-38	1.081	1.005
Illinois	10- 1-37	.859	1.003
	10-31-38	.885	
Iowa	7- 4-37	.898	1.036
	6-30-38	.839	
Kentucky	4-16-37	..	1.044
	6-30-37	.797	
	6-30-38	1.018	
Maryland	5-31-38	.973	1.005
Massachusetts	12-31-37	.884	1.037
	12-31-38	.935	
New Mexico	3-31-37	.752	
	6-12-37	..	1.134
	3-31-38	.970	
Rhode Island	9-15-36	..	1.347
	10- 1-37	.826	
	10- 1-38	.906	
South Carolina	7- 1-37	.874	1.144
	9- 1-38	.897	
Utah	1- 1-38	.912	1.044
	1- 1-39	.867	
Vermont	2-28-37	.906	
	6- 1-37	..	1.028
	6- 1-38	.918	

A review of these changes in rate levels leads to the conclusion that law amendments are of relatively minor importance at the present time. It will be seen that, with three exceptions, every change due to law amendment was accompanied or followed by a greater change in rates due to experience. The three exceptions are the revisions in Georgia, New Mexico and Rhode Island.

(Strictly speaking, the Rhode Island law change of September 15, 1936 does not belong in this list, since it was more than two years prior to January 1, 1939). The New Mexico law amendment of June 1937, which raised rates 13.4%, followed less than three months after a general rate revision in which the experience indicated a decrease of 24.8%. The Rhode Island increase of 34.7% because of the law amendment was followed a year later by an indicated decrease of 17.4% and two years later by a further indicated decrease of 9.4%. This latter decrease would not have been so great if the 1937 rates had not included a contingency loading of 8.7%.

The exhibit appended may be of some interest, since it shows the relationship between the losses as actually incurred and the same losses as finally modified in the calculation of pure premiums. The examples cited are taken from a recent Massachusetts rate revision. It so happened that the projection factors used in this revision almost exactly balanced the loss development and the law amendment factors, so that the final modified losses are very nearly equal to the actual losses as taken from reports of Schedule Z. It will be seen that the ratio of modified losses to actual losses is fairly constant for all classes, especially for the medical portion of the experience. The largest differences between actual and modified losses occur among the serious losses, especially in the experience of classes 2300 and 2402. The presence of a permanent total claim in the experience of class 2300 without a sufficiently large number of other serious cases accounts for the increase in losses by modification for this class. For class 2402, the modified serious losses are only 87.8% of the actual losses, due to the fact that there were no serious losses in the last year of the experience period.

It is to be noted that the actual losses are very nearly equal to the modified losses in all cases where the experience is large enough to warrant 50% credibility or more; in such cases the difference in pure premium is never greater than $.02. Where the credibility is less than 50%, the differences between actual and modified losses are of academic interest only, since the rate-making formula gives so much weight to the national experience. Therefore if the losses had been modified by average law amendment and projection factors similar to those herein discussed, the

results, in terms of final manual rates, would hardly be distinguishable from those obtained today.

CONCLUSION:

On the basis of the foregoing considerations it is the author's proposal that our compensation rate-making structure be reviewed for the purpose of determining the desirability of the following changes:

1. Loss projection factors which shall be uniform for all policy years. It would probably be desirable to use separate factors for each industry group, or to make distinctions between Serious, Non-Serious and Medical losses.
2. Law amendment factors which shall be uniform for all policy years, and be separated only as between Serious, Non-Serious and Medical losses.

It would be fairly easy to demonstrate that the proposed changes would result in simplification of the present manual rate-making procedure and the experience rating plan. There can be no pretense that the few examples cited here have conclusively proved that rates so made would more accurately reflect future conditions. It is hoped, however, that the various considerations here given will be of assistance to other members of the society in any discussion of revisions in our methods of manual rate-making.

MASSACHUSETTS COMPENSATION LOSSES

POLICY YEARS 1932 - 1936

AS USED IN REVISION EFFECTIVE DECEMBER 31, 1938

Class Code	Type of Benefit	Credibility Assigned to Mass. Exp.	Actual Losses*	Modified Losses**	Ratio Modified to Actual	Indicated Pure Premiums		Formula Pure Prems. Modified
						Actual	Modified	
2042	Serious	..	13,631	13,551	.994	.26	.26	.29
	Non-Serious	.50	14,587	14,202	.974	.28	.27	.33
	Medical	.50	19,330	18,372	.950	.37	.36	.36
						.91	.89	.98
2101	Serious	..	3,685	3,783	1.027	.09	.09	.29
	Non-Serious	.50	21,736	21,708	.999	.51	.51	.52
	Medical	.50	21,586	20,764	.962	.50	.48	.49
						1.10	1.08	1.30
2164	Serious	..	..	..	..	..	..	.46
	Non-Serious	.25	8,764	9,074	1.035	.59	.62	.68
	Medical	.25	8,645	8,343	.965	.58	.56	.69
						1.17	1.18	1.83
2288	Serious	..	7,729	7,772	1.006	.29	.29	.59
	Non-Serious	.25	6,862	6,815	.993	.26	.26	.46
	Medical	.25	7,010	6,738	.961	.27	.26	.43
						.82	.81	1.48
2300	Serious	..	31,897	36,076	1.131	.37	.41	.11
	Non-Serious	.50	30,372	31,143	1.025	.35	.36	.30
	Medical	.25	28,931	26,598	.919	.33	.31	.21
						1.05	1.08	.62
2402	Serious	.25	23,329	20,493	.878	.21	.18	.18
	Non-Serious	.50	27,801	28,733	1.034	.25	.25	.23
	Medical	.50	26,738	25,869	.967	.24	.23	.22
						.70	.66	.63
2417	Serious	1.00	102,911	104,958	1.020	.26	.26	.26
	Non-Serious	1.00	99,605	97,352	.977	.25	.24	.24
	Medical	1.00	107,188	101,499	.947	.27	.26	.26
						.78	.76	.76
2623	Serious	1.00	181,228	182,168	1.005	.31	.31	.31
	Non-Serious	1.00	216,407	213,374	.986	.37	.37	.37
	Medical	1.00	200,978	191,626	.953	.35	.33	.33
						1.03	1.01	1.01
4410	Serious	1.00	87,298	85,991	.985	.36	.35	.35
	Non-Serious	1.00	105,255	103,085	.979	.43	.43	.43
	Medical	1.00	110,737	105,244	.950	.45	.43	.43
						1.24	1.21	1.21

* Actual losses as reported in Schedule Z.
** Same losses modified by loss development, law amendment and projection factors.

MASSACHUSETTS COMPENSATION LOSSES

POLICY YEARS 1932 - 1936

AS USED IN REVISION EFFECTIVE DECEMBER 31, 1938

Class Code	Type of Benefit	Credibility Assigned to Mass. Exp.	Actual Losses*	Modified Losses**	Ratio Modified to Actual	Indicated Pure Premiums		Formula Pure Prems. Modified
						Actual	Modified	
2702	Serious	..	7,801	7,057	.905	1.47	1.33	2.88
	Non-Serious	.25	9,258	9,119	.985	1.75	1.72	2.37
	Medical	.25	8,151	7,670	.941	1.54	1.45	2.47
						4.76	4.50	7.72
6319	Serious	..	21,425	20,733	.968	1.64	1.59	1.43
	Non-Serious	.50	27,125	26,942	.993	2.08	2.06	1.76
	Medical	.25	16,862	16,036	.951	1.29	1.23	1.09
						5.01	4.88	4.28
5538	Serious	.50	18,752	18,848	1.005	.32	.32	.63
	Non-Serious	1.00	27,589	27,976	1.014	.47	.48	.48
	Medical	1.00	23,742	23,010	.969	.40	.39	.39
						1.19	1.19	1.50
Total of Above Classes	Serious		499,686	501,430	1.003			
	Non-Serious		595,361	589,523	.990			
	Medical		579,898	551,769	.951			

* Actual losses as reported in Schedule Z.
** Same losses modified by loss development, law amendment and projection factors.

THE PRACTICE OF WORKMEN'S COMPENSATION RATEMAKING AS ILLUSTRATED BY THE 1939 REVISION OF NEW YORK RATES

BY

CHARLES M. GRAHAM

The method followed in revising Workmen's Compensation rates in the State of New York differs in some respects from the standard or National Council method. New York, however, is an industrial empire in itself. It produces the largest volume of workmen's compensation experience of any state in the Union. It seems fitting, therefore, to select the New York method of ratemaking as a vehicle for describing, in detail, the present *modus operandi* of workmen's compensation ratemaking.

The general subject may be conveniently divided into three parts, as follows:

PART I—An exposition of the basic principles governing the determination of manual rates.

PART II—The determination of classification relativity, i.e., pure premiums, which has always been done by the National Council on Compensation Insurance.

PART III—The determination of the final collectible rate level, the adjustment of the pure premiums as determined by the National Council to such level, and the determination of the final printed manual rates. This step also includes the determination of loss and expense constants.

PART I

The basic principles underlying the present method of rate determination in New York State were first enunciated on December 14, 1933 by the Actuarial Committee of the Compensation Insurance Rating Board by the passage of the following resolution on the date mentioned:

"RESOLVED: That in calculating the rate level for any particular revision, this principle shall be kept in mind as an ultimate goal: That from a specified date the unloaded premiums shall equal the losses in the aggregate."

On May 17, 1934, the Governing Committee of the Compensa-

tion Insurance Rating Board referred the following resolution, pertaining to the July 1, 1934 revision, to the Actuarial Committee, for its consideration:

"RESOLVED:

1. That the basic pure premiums based on the classification experience of policy years 1927-1931 inclusive, shall be keyed to the level of policy year 1932 developed to an ultimate basis both for medical and indemnity losses;

2. In accordance with the principle that rates shall be adequate to meet all losses over a period of years, rates as finally calculated shall contain a basic contingency loading of 2.5 points which shall vary according to the following conditions:

   (a) Beginning with calendar year 1933 and including all subsequent calendar years, a record shall be kept of the accumulated profit or loss resulting from a realized loss ratio less than or greater than 60%.

   (b) The basic contingency loading of 2.5 points shall vary with the accumulated profit or loss thus determined from a minimum of zero when the accumulated profit is equal to 2.5% of the earned premium of the latest calendar year, to a maximum of 5.0 points when the accumulated loss is equal to 2.5% or more of the earned premium of the latest calendar year."

On May 23, 1934, the Actuarial Committee of the Compensation Insurance Rating Board, considered the foregoing action of the Governing Committee and adopted the following resolution:

"WHEREAS, this Committee on December 14, 1933 adopted the following resolution—

RESOLVED, that in calculating the rate level for any particular revision, this principle shall be kept in mind as an ultimate goal: That from a specified date the unloaded premiums shall equal the losses in the aggregate,

RESOLVED, that it is the sense of this Committee that we adopt a consistent plan to be followed in all future rate revisions beginning with the contemplated revision on July 1, 1934, the plan to embody the following principles:

1. That the basic pure premiums based on the classification experience of the latest available five policy years shall be keyed to the level of the latest policy year developed to an ultimate basis both for medical and indemnity losses;

2. In accordance with the principle that rates shall be adequate and reasonable to meet all losses over a period of years, rates as finally calculated shall contain a basic contingency loading of 2.5 points which shall vary according to the following conditions:

   (a) Beginning with calendar year 1933 and including all subsequent calendar years, a record shall be kept of the accumulated profit or loss resulting from a realized loss ratio less than or greater than the permissible;

   (b) The basic contingency loading of 2.5 points shall vary (rounded off to the nearest half point) with the accumulated profit or loss thus determined from a minimum of zero when the accumulated profit is equal to 2.5% of the earned premium of the latest *calendar* year, to a maximum of 5.0 points when the accumulated loss is equal to 2.5% or more of the earned premium of the latest *calendar* year;"

The foregoing procedure was followed consistently in the New York revisions effective July 1st of each year from 1934 to 1938 inclusive. Meanwhile, there had been considerable discussion regarding the propriety of using the exact experience indications of Part IV of the Casualty Experience Exhibit to determine the realized profit or loss, which, in turn, determined the contingency factor*. The calendar year experience in Part IV of the Casualty Experience Exhibit, included not only actual changes in estimates of incurred loss, but also additions to incurred losses made necessary because of the fact that the reserves on many cases had been calculated on a discounted basis. Exhaustive tests were made to measure the increase in incurred losses resulting from the revaluation of the incurred losses on cases originally set up on the basis of discounted reserves. At the meeting of the Actuarial Committee of the Compensation Insurance Rating Board, held on Thurs-

* For a complete treatment of this subject, the reader is referred to Mr. Cahill's paper, "Contingency Loading—New York Workmen's Compensation Insurance," in this issue.

day and Friday, March 9 and 10, 1939, the following motion was passed:

> "That in calculating the contingency factor for the 1939 rate revision the figures for each calendar year shall be modified to recognize the interest discount for tabular cases of those policy years developed to more than sixty months in each calendar year."

A recalculation of the indicated calendar year profit or loss, chargeable to policy years developed more than sixty months, eliminating the upward revision in losses due solely to the effect of interest discount, changed the picture materially, indicating that the contingency factor, which had been 5.0 points, would be removed entirely in the rate revision effective July 1, 1939. This was almost entirely due to the excellent experience of calendar year 1938, as tests indicated that the contingency factor would have remained at 5.0 points for all rate revisions prior to the 1939 revision had the interest discount adjustment been in effect since the beginning of the present ratemaking program in 1934.

Discussion in the Actuarial Committee developed the point that it was considered undesirable to discontinue the entire contingency factor of 5.0 points at one particular time due to the possibility that this factor or a part of it might have to be reintroduced at the next rate revision. In order to insure some degree of rate stability, and further bearing in mind that the elimination of the contingency factor was solely due to the introduction, for the first time, of the principle of eliminating the increase in incurred losses of older years due to interest discount, the Committee amended paragraph 2(b) of its resolution of May 23, 1934, by adding the following phrase:

> "; provided, however, that the contingency loading shall not differ by more than 2.5 points from the contingency loading in the preceding rate revision."

This means, in brief, that the basic program as respects ratemaking, which was originally adopted in 1934, has been modified in only two respects up to the present time; first, by eliminating from the incurred losses as reported in the Casualty Experience Exhibit—Part IV, the amounts incurred by reason of the constantly increasing cost of cases on which discounted reserves were originally set up and which cases are chargeable to policy years

developed more than sixty months; and second, by limiting the change in the contingency factor to 2.5 points in any one revision. The basic program, adopted in 1934 is otherwise in full force and effect at the present time.

PART II

The first process in the making of New York Manual rates is the determination of classification relativity, or, in other words, pure premiums for the various classifications which are included in the New York Manual. Certain classifications are subject to special ratemaking treatment and are, therefore, not included in the standard ratemaking process and will not be covered in this paper. These classifications include maritime coverages and "a" rated classifications.

Classification experience is compiled by the Compensation Insurance Rating Board from reports under the New York Unit Statistical Plan and is published and circularized to member carriers in bound form. Complete data are shown, covering payrolls exposed, both on a full coverage and ex-medical coverage basis; premiums earned, on both bases mentioned; loss and expense constants; and losses incurred, separated between indemnity and medical and further separated by kind of injury. Occupational disease experience is also shown, but is not included in the ratemaking procedure herein described. A separate ratemaking procedure is followed for the determination of supplemental occupational disease charges for classifications having a substantial dust disease hazard. Classifications not having a substantial dust disease hazard have a percentage charge added to the classification rate as hereinafter explained.

For the revision of New York rates, effective July 1, 1939, the National Council on Compensation Insurance received from the Rating Board, the classification experience of policy years 1932 and 1933, based on the fourth and final reports under the Unit Statistical Plan; the experience of policy year 1934, based on third reports; of policy year 1935, based on second reports; and of policy year 1936, based on first reports. From this classification experience, the National Council eliminated all discontinued and unassigned classifications, all "a" rated classifications and all maritime classifications. These classifications are known as

standard exclusions and are always excluded from both the experience used in computing group rate levels and the experience used in computing classification pure premiums. Ex-medical earned premiums are adjusted to a full coverage basis by dividing such premiums by the complement of the current ex-medical ratio. This adjustment is made only in classifications in which the ex-medical payroll exceeds ten percent of the total payroll. In other classifications no adjustment is made.* Revenue due to loss and expense constants, and to the general catastrophe loading of 1¢, is eliminated. The actual earned premiums are then summed by policy year and by industry group to produce the actual earned premiums shown in Column I of the premium and loss exhibits, by policy years, and industry group. There are five industry groups in the July 1, 1939 New York revision, as follows:

1. Manufacturing
   (Schedule Groups 050 to 253, inclusive).
2. Contracting
   (Schedule Groups 260 to 279, inclusive).
3. Stevedoring (or "Federal") (Including Ship Building)
   (Schedule Groups 280 and 300—also Classifications 8709 and 8726 from Group 353).
4. Servants—Per Capita
   (Classifications 0912 and 0913 only).
5. All Other
   (All remaining groups and classes excepting standard exclusions).

The actual incurred losses for those classifications in which the ex-medical payroll exceeds ten percent of the total payroll are then adjusted to a full medical basis by applying the latest national medical pure premiums, corrected to the New York level, to the payrolls exposed under ex-medical coverage to produce medical expected losses, which are then combined with the actual medical losses incurred on full coverage policies.*

Excess catastrophe losses (losses arising from accidents involving serious injuries to two or more persons) are eliminated by the following method:

(1) If the total indemnity cost is less than twice the average value of death and permanent total cases for the policy year in question, no adjustment is made.

* Refer to Appendix B for a suggested change in this practice.

(2) If the total indemnity cost exceeds the amount determined as above, the two most costly cases are included provided they equal or exceed twice the average value. Sufficient additional losses are added, if necessary, to equal twice the average value. Excess losses are eliminated.

(3) All medical losses are included without adjustment.

The losses are then tabulated and are adjusted by factors which will bring them to the expected level of the final or fourth report of experience. As policy years 1932 and 1933 are already based on fourth reports, no development factors are necessary. Policy year 1934 is developed from third to fourth reports, using factors calculated as averages of the last two years available on a fourth report basis, namely, policy years 1932 and 1933. Policy year 1935 is developed from a second to fourth report basis by using development factors applicable to policy year 1934 multiplied by development factors from second to third reports, which are calculated as the average of the developments for policy years 1933 and 1934. 1935 development factors are applied to 1936 with an additional multiplier from first to second reports, based on the experience of policy years 1934 and 1935 combined. Incurred losses so developed are shown in Column 2 of the premium and loss exhibits by policy years, as actual incurred losses.

It is next necessary to determine the industry group loss ratios on the basis of existing collectible rates. The process is as follows:

1. The printed manual rates of July 1, 1938, are corrected for subsequent interim changes up to and including April 22, 1939.
2. From the corrected rates are deducted, (a) the flat catastrophe loading of 1¢, applied to all classification rates in New York State; (b) the general occupational disease loading of 1% (subject to a minimum limit of 1¢, a maximum limit of 5¢).
3. The rates thus reduced are extended by the policy year classification payrolls.
4. The premiums thus produced are divided by a combined factor, composed of, (a) the element applied to the July 1, 1938 rates to offset the premium produced by loss and expense constants; (b) the element applied to offset the off-balance of the experience rating plan; (c) the factor for the security funds; (d) a factor making adjustment from the permissible loss ratio of 60.5 for New York State to the standard permissible loss ratio of 60%.

This process gives classification premiums by policy year based on July 1, 1938 collectible rates, and these are entered in Column 4 of the premium and loss exhibit.

The losses of the same classifications are then adjusted to the level of the benefits provided by the New York law as of July 1, 1938, by the use of amendment factors computed on the basis of the American Accident Table. These losses, as previously stated, have already been developed to a fourth reporting basis. The only remaining step for the completion of the premium and loss exhibits, is to convert the medical losses to the level indicated by the last policy year, i.e., policy year 1936. This is done by adjusting the medical losses from the loss ratio level of each policy year to the loss ratio level of the last policy year. The factors are actually computed on the basis of all industry groups combined by adding the premiums at July 1, 1938 collectible rates, and the losses on the July 1, 1938 law level and on a developed basis, and determining the medical loss ratio by policy year for all industry groups combined. The ratio of the medical loss ratio for each of the first four years to the latest year, determines the medical projection factor, which is then applied to the medical losses to place them on the level of policy year 1936. The medical losses so converted, added to the indemnity losses on the July 1, 1938 law level, produce the losses shown in Column 5 of the premium and loss exhibits, attached to the National Council's memorandum dated April 22, 1939.

It is next necessary to determine the group rate level loss ratios on the basis of the last two years of experience available and to adjust these loss ratios so that they will reproduce the loss ratio of the last year for all groups combined. At this point it will probably be of interest to mention that the standard ratemaking procedure, as practiced by the National Council, establishes a minimum premium qualification of $1,000,000 for the establishment of an industry group rate level loss ratio on the basis of the group experience exclusively. Where the industry group premium falls below $1,000,000, the selected loss ratio for the industry group is determined by taking a percentage of the group loss ratio indications and the complement of this percentage of the loss ratio indications for all groups combined. Since, however, each industry group in New York produces premiums in excess of

$1,000,000, this computation is not needed and will not be discussed further. The actual process of adjustment involves the determination of the industry group loss ratios on the basis of the last two available policy years, 1935 and 1936, based on July 1, 1938 collectible premiums, and incurred losses on the July 1, 1938 benefit level (excluding, however, the medical projection inasmuch as that is taken care of in the loss ratio adjustment). The industry group loss ratios, based on the two years mentioned, are then applied to the premiums of policy year 1936 at the July 1, 1938 collectible level, to determine formula expected losses. These losses are then summed for all groups and are compared to the policy year 1936 premiums for all groups to determine the total loss ratios for all groups based on the premium distribution of the latest policy year. The loss ratio of all groups for policy year 1936, which is the temporary rate-level basis, is then divided by the policy year 1936 loss ratio for all groups determined as heretofore described, and the indicated adjustment factor is applied to each industry group loss ratio based on the experience of policy years 1935 and 1936 combined to determine the loss ratio to which the classifications in each industry group will be keyed. These loss ratios are shown on page 2 of the National Council's memorandum and are as follows:

INDUSTRY GROUP LOSS RATIOS — NEW YORK

Industry Group	1935 - 36 Loss Ratios Adjusted to Reproduce 1936 Loss Ratio Over All		
	(1) Indemnity	(2) Medical	(3) Total
Manufacturing	36.3	19.3	55.6
Contracting	40.8	14.1	54.9
Stevedoring (or "Federal")	42.2	14.8	57.0
Servant Per Capita	44.4	16.9	61.3
All Other	36.6	18.1	54.7
All	37.6	17.5	55.1

Having calculated the premium and loss exhibits and determined the industry group rate levels therefrom, it is next necessary to prepare the classification experience, converted to these rate levels, with sufficient additional comparative information respecting national pure premiums, pure premiums indicated by the formula (which will be hereinafter described), pure premiums

underlying the present rates and the pure premiums recommended for adoption, so that pure premium selections may be made by the Classification and Rating Committee of the New York Board, to serve as the basis of the July 1, 1939 rates. In order to do this, use is made of the same basic data as enters into the preparation of the premium and loss exhibits. Payrolls, however, are tabulated rather than premiums because of the fact that pure premiums are quoted in $100 units of payroll.

The experience of each classification is now available with losses converted to the law level of July 1, 1938. Rate levels for each of the five industry groups have been determined. From the figures which were prepared in determining the rate level of each industry group, projection factors are calculated for each industry group as a ratio of the temporary rate level loss ratio (policy year 1936) to the loss ratio of each of the policy years. Since all of these loss ratios are on a developed basis, it is necessary again to multiply in the loss development factors, due to the fact that these factors cancel out in the determination of the projection factor, and the factors are to be applied to actual undeveloped losses. The actual projection and development factors used, are shown at the bottom of page 3 of the National Council's memorandum of April 22, 1939.

It is next necessary to determine the amount of credibility which will be given to the experience of each of the classifications that are being reviewed. In order to have a uniform credibility standard, the average costs of serious cases (death, permanent total and major disability cases), and non-serious cases (minor permanent and temporary total disability cases) have been determined by dividing the number of such cases included in the Unit reports for the five year experience period, into the losses converted to the July 1, 1938 benefit level developed to fourth report and adjusted to the temporary rate level for each industry group. All groups added together, however, are used for the determination of these figures. The result is an indicated average cost of $5,071 for serious cases, and $186 for non-serious cases. It has been determined, purely on actuarial and underwriting judgment, that 25 serious cases and 300 non-serious cases, based on the averages mentioned, should be sufficient to allow a classification to be rated on its own experience. The medical criterion for classification

self-rating has been arbitrarily taken at 80% of the value for non-serious. The computations result in establishing the following figures for full credibility on the manual rate level:

Serious.....126,775 Non-Serious.....55,800 Medical.....44,640

In order to have a standard basis for determination of classification credibility, it is necessary that the expected losses for full credibility be determined on the basic level on which national pure premiums have been established. This basic level is now 25% above the New York 1927 level. The 1932 to 1936 payrolls have, therefore, been extended at the present national pure premiums on basic level (which are based on policy years 1930 to 1934, inclusive), to produce the total expected losses on basic level for the three pure premium divisions; serious, non-serious and medical. These expected losses, on the basic level, are then divided by the actual state losses on the manual rate level, to produce factors to adjust the credibility criteria to the basic level. The indicated criteria for full credibility, on the basic level, and the adopted criteria, are as follows:

	Actual Indications	Adopted Figures (Rounded)
Serious	132,226	132,200
Non-Serious	61,380	61,400
Medical	34,641	34,600

Eight credibility groups have been used in computing New York pure premiums, as follows:

Credibility Group	State Credibility	Volume of Expected Losses (Manual Rate Level)		
		Serious	Non-Serious	Medical
A	100%	126,775	55,800	44,640
B	75%	95,081	41,850	33,480
C	50%	63,388	27,900	22,320
D	25%	31,694	13,950	11,160
E	20%	25,355	11,160	8,928
F	15%	19,016	8,370	6,696
G	10%	12,678	5,580	4,464
H	0% Less Than	12,678	5,580	4,464

The credibility criteria given above are stated on the New York level. The fact that the credibility groups are actually determined

on the basic level makes no difference in the final result, as the credibility criteria have been adjusted, as explained above, by the difference between the total state losses and the expected losses indicated by the application of the national pure premiums to the state payrolls. In this connection, it should be borne in mind that the expected losses must be corrected to the state actual losses in any event, so far as the total experience is concerned.

The actual state experience is exhibited by classification and policy year in order within industry group. Payrolls are shown to the nearest $100, with the number and amount of serious and non-serious losses, the amount of medical losses, and the indicated pure premiums for each policy year for the total losses combined. The pure premium indications of policy years 1932-1936 are also shown on the industry group rate level adjusted to the 1936 loss ratio indications. An exhibit of this kind is prepared for each New York classification on which any part of the total pure premium (serious, non-serious or medical) receives any credibility whatsoever. The credibility group is indicated on the classification experience exhibit by a capital letter typed immediately after the word "serious," "non-serious" or "medical," which indicates the respective loss and pure premium columns. Those classifications in which the volume of experience is so small as to indicate no local or state credibility, are termed the "non-reviewed" classes and are not shown. These classifications are reviewed by the Compensation Insurance Rating Board to determine whether any of them are to have pure premiums established by analogy to other classes or by special underwriting treatment. Otherwise, the national pure premiums are recommended for adoption.

In order to complete the classification experience exhibits, it is necessary to calculate average reversion factors for each industry group and for each pure premium division to measure the departure of the expected losses on the national level from the actual losses on the manual rate level to the extent to which national experience is used in lieu of state experience. This is accomplished by applying the national credibility (which is the complement of the state credibility) to the actual losses on manual rate level and to the expected losses on the national or basic level, summing the results and dividing the actual losses on manual rate

level so obtained by the expected losses on the national or basic level. The result may be described as a combined reversion and correction factor which brings the national pure premiums (to the extent to which they are used) to the level of that portion of the aggregate New York State experience which was not used in determining pure premiums. These factors are applied to the national pure premiums on the basic level to place them on a comparable basis with the actual New York experience. The result is shown on the line captioned "P.P.: National," on the classification experience exhibits.

The formula pure premiums, as shown on the classification experience exhibits, are computed by taking the appropriate percentages of the New York State indications according to the credibility symbol, and the complementary percentages of the national pure premiums. If a classification qualifies for 100% state credibility throughout, the formula pure premiums are the same as the state indications. If the classification qualifies for 50% credibility, as respects the serious pure premium, and 100% credibility as respects the non-serious and medical pure premiums, the non-serious and medical pure premiums would be the same as the state indications while the serious pure premium would be computed by taking one-half of the national pure premium and adding it to one-half of the state indications, or, in other words, taking 50% of the difference between the national and state indications and adding it to the lower of the two.

The classification exhibit next shows the pure premiums underlying the existing, or July 1, 1938, rates on the same level as the new indications. These pure premiums are computed by adjusting the selected pure premiums for the 1938 revision to the level of the formula and proposed pure premiums as follows:

(1) The rate increase, effective July 1, 1938 which included the factor of 1.012 for the security fund, was 1.017. The test of the new pure premiums computed by the National Council, indicated a level of .928 when compared to those in force prior to July 1, 1938. Dividing the rate increase of 1.017 by the pure premium test factor of .928, produced a factor of 1.096 to adjust the selected pure premiums for the July 1, 1938 revision to the final rate level.

(2) The industry group rate levels for the current (July 1, 1939) revision, were determined by applying the July 1,

1938 rates less catastrophe and occupational disease loadings and further reduced by dividing the remaining portion of the rate by the product of the offsetting reduction, the security fund factor and the expense constant factor. The loss ratios to which these rate levels are keyed, compare with the permissible loss ratio of 60.0% as follows:

Manufacturing	.927
Contracting	.915
Stevedoring	.950
Servant Per Capita	1.022
All Other	.912

The above factors would normally be multiplied by the factor of 1.096, which was used in 1938, to adjust the selected pure premiums to the rate level. However, the security fund factor—1.012, must be divided out of the factor of 1.096 and the quotient should then be multiplied by the industry group rate level changes listed above. This produces the following factors which have been applied to the July 1, 1938 pure premiums to indicate the pure premium underlying existing rates on the same level as the other pure premiums shown on the classification experience exhibits:

Manufacturing	1.0036
Contracting	.9907
Stevedoring	1.0284
Servant Per Capita	1.1069
All Other	.9877

The July 1, 1938 pure premiums modified by these factors appear on the line captioned "P.P.: Underlying Present Rate."

The last line of the classification experience exhibits on which pure premiums have been entered, shows the pure premium selections of the combined staffs of the Compensation Insurance Rating Board and the National Council. While the Committee exercises some judgment in making these selections, the basic method employed is to compare three pure premium indications: first, the state indications; second, the formula pure premium; and third, the pure premium underlying the present rate. For self-rating classifications, the formula and state indications will, of course, be the same and except in very rare instances, will be the Committee's selection. In other cases, the Committee generally

selects that pure premium which lies between the other two pure premiums being considered. In other words, if the formula pure premium is below the pure premium underlying the present rate, but the state indications are above the pure premium underlying the present rate, the present pure premium will be reaffirmed.

After the pure premiums have been selected by the combined staffs, a test of the effect of these pure premium selections is necessary. To accomplish this, it is necessary that the expected losses underlying the existing rates be determined. These are determined by subtracting the occupational disease and catastrophe loadings from the July 1, 1938 manual rates, extending the rates so modified by the policy year 1936 payrolls by classification, and dividing the premiums so obtained by the composite factors shown below:

Industry Group	(1) Off-balance and Offsetting Reductions	(2) Expense Multiplier 1.0 ÷ .605	(3) Security Fund Loading	(4) Composite Factor (1) × (2) × (3)
Manufacturing ...	.9841	1.653	1.012	1.6452
Contracting	.9953	1.653	1.012	1.6650
Stevedoring	1.0000	1.653	1.012	1.6728
Servant Per Capita	1.0000	1.653	1.012	1.6728
All Other	.9474	1.653	1.012	1.5848

It will be noted that the composite factors shown above, are identical with the factors used in preparing the premium and loss exhibits with the exception that the expense loading is also removed, as we are now dealing with expected losses, whereas in the premium and loss exhibits we were dealing with collectible premiums.

The formula pure premiums and the pure premiums proposed by the combined staffs of the Rating Board and Council, are then multiplied separately by the 1936 payrolls, and ratios of the formula pure premiums, and the proposed pure premiums, to the present pure premiums are determined by industry group separately for reviewed and non-reviewed classes, and also in total. These ratios represent a comparison of the pure premium selections with the pure premium selections underlying the existing rates, in terms, however, of the industry group loss ratios keyed to the total loss ratio of all industry groups for policy year 1936. The ratios, therefore, must be modified by any further adjustment

which is made from the loss ratio of policy year 1936 for each industry group, to the final adopted loss ratio which is to underlie the July 1, 1939 rates, plus whatever contingency factor is to be adopted, any amendment factors which are introduced into the rates after the pure premiums have been determined, and such adjustments as are to be made in the collectible rate level because of the off-balance of the Experience Rating Plan and the effect of loss and expense constants. These adjustments will be discussed in Part III of this paper.

The selections of the combined staffs of the Rating Board and the National Council are reviewed by the Classification and Rating Committee of the Compensation Insurance Rating Board, which has the final decision with respect to the selection of pure premiums for individual classifications. The Committee makes, as a rule, very few changes in the selections of the combined staffs of the Rating Board and the National Council.

For those classifications for which no classification experience exhibit is prepared, the national pure premiums will normally apply. The only exceptions to this rule would be classifications which might be rated by analogy to other classifications, or possibly New York special classifications where the experience is not broad enough to receive credibility.

At this stage of the ratemaking procedure, the determination of classification relativity has been completed.

PART III

In Part II of this paper, the process of determining classification relativity, i.e., the determination of pure premiums keyed to the 1936 policy year experience of the five industry groups, was described. It is now necessary to determine, first, the final rate level change, and second, the apportionment of the rate level change in such a manner that when the revenue accruing from loss and expense constants on risks producing annual premiums of less than $500, is allowed for, and the premiums on risks over $500 in size are properly modified for the effect of the additional premium accruing from loss and expense constants and also for the expected off-balance of the Experience Rating Plan, the loss ratios of the group of risks under $500 in annual premium size

and the group of risks over $500 in annual premium size, will be approximately equalized.

To accomplish the first step in the determination of the final rate level, it is necessary to determine the indicated rate level change based on the developed experience of policy year 1937. This is done by compiling the earned premiums and incurred losses reported by all carriers in the call for loss ratio data as of December 31, 1938. These data indicated (as of 24 months development) the following figures:

Earned Premium	$78,547,607
Indemnity Losses	28,624,811
Medical Losses	12,570,475
Indemnity Loss Ratio	36.44%
Medical Loss Ratio	16.00%
Total Loss Ratio	52.44%

The above figures must be developed to an ultimate basis. This is considered to be development to 60 months from the beginning of the policy year. Development factors are determined by calculating separate factors for premiums earned, indemnity losses incurred and medical losses incurred for the two latest years available for the development period required. In other words, from the experience of policy years 1933 and 1934, development factors from 48 months to 60 months are determined. From the combined experience of policy years 1934 and 1935, development factors from 36 to 48 months are determined while the development factors from 24 to 36 months are based on the combined experience of policy years 1935 and 1936. The product of the three sets of development factors determines the selected development factors to be applied to premiums, indemnity losses and medical losses for policy year 1937 to develop them from 24 months to 60 months. New loss ratios are calculated based on the developed experience and these loss ratios are then adjusted for the effect of the increases in rate level effective July 1, 1937 and July 1, 1938 modified by a factor of 1.012 to cover payments to the security funds. After this adjustment is made, the final loss ratio to which the new rates would be keyed, is determined to be 52.42%.

As outlined in Part I, the contingency factor is determined on the basis of the calendar year underwriting results of all carriers, beginning with calendar year 1933 and terminating with calendar year 1938, with an adjustment eliminating the effect of interest discount on outstanding losses valued on a present value basis for all policy years developed beyond 60 months. Developments in special reserves for interest discount exclusively, reported by carriers maintaining such reserves, are also eliminated. That portion of the premiums earned which accrued from the introduction of the factor for the security funds is eliminated from the premiums earned for those years during which this factor was required. The premiums earned as modified by the exclusion of the security fund premium, are then compared directly with the losses incurred to determine the calendar year profit or loss by multiplying such premiums by the permissible loss ratio of 60% and adjusting the result to eliminate the increase in incurred losses which occurred solely from the increases in discounted reserves on policy years developed more than 60 months, also removing all adjustments in reserves held by certain carriers for interest discount exclusively. The result is a calendar year profit of $7,120,875 for calendar year 1938, which, when combined with an accumulated underwriting loss of $3,933,407 for calendar years 1933 to 1937 inclusive, indicates an accumulated underwriting profit of $3,187,468 for the period from January 1, 1933 to December 31, 1938. As this amount is more than 2.5% of the 1938 earned premium (excluding the security fund factor) of $77,278,200, the maximum reduction of 2.5 points in the contingency factor is indicated. This means, in brief, that the permissible loss ratio used in calculating the 1939 rate level change is to be 57.5%.

Before determining the actual rate level change, it is necessary to introduce the factor of 1.012 to provide for the premiums to be paid into the security funds and also to introduce the factor of 1.003 to provide for the special assessment for the reopened case fund provided for under Chapter 252 of the Laws of 1939. Therefore, the indicated rate level change is arrived at as follows:

$$\text{Indicated Rate Level Change} = \frac{52.42\%}{60.0\% - 2.5\%} \times 1.012 \times 1.003 = .925.$$

It should be borne in mind that at the last revision, this rate level change was determined at a time when certain law amendments were pending. Such of these law amendments as were subsequently enacted into law were, therefore, introduced into the rate structure at a later date and will be covered in subsequent paragraphs of this part of the paper.

Having determined the adjustment in the general collectible level of rates, we now proceed to apportion this change in rate level in such a manner that the loss ratios of non-experience rated risks (less than $500 annual premium) will be equivalent to the loss ratios of experience rated risks (risks with an annual premium of $500 or more) and so that the aggregate premium on all business will produce the permissible loss ratio for the state. In order to do this, it is necessary to determine the loss ratios of the two groups of risks involved, within each industry group. This is accomplished by the following steps:

I — Calculation of Premium Excess to be used for the Determination of Offsetting Reductions and Loss Constants.

(a) The experience of the last three policy years available on Unit reports, namely, 1934, 1935 and 1936, is used.

(b) The calculations are made separately for each industry group and within each industry group for risks with premiums of less than $500 and for risks with premiums of $500 or more per annum.

(c) The classification payrolls are multiplied by the selected pure premiums, times the expense loading adjusted by the factor to translate the selected pure premiums to the rate level. This latter factor is determined by dividing the rate level change, as determined above, by the factor determined from the National Council's test of the selected pure premiums (after adjustment to divide the security fund factor of 1.012 out of the result of the pure premium test). The National Council's test, indicating a factor of .919, divided by the security fund factor of 1.012, produces a factor of .908, which, when divided into the indicated change in the collectible rate level of .925, produces a factor of 1.019 to adjust the selected pure premiums to the rate level. The total premiums at full proposed rates so determined, appear in Sheet 1 of Exhibit 5, of the calculations of the 1939 revision.

(d) Indemnity losses incurred are determined by eliminating

the excess portion of the catastrophe losses by the same method as was used by the National Council in preparing the pure premium exhibits.

(e) Medical losses are adjusted to a full coverage basis by multiplying the total premiums by the medical loss ratio indicated on business subject to full medical coverage only.

(f) Actual loss ratios are then determined for risks under $500 and for risks of $500 and over within each industry group. These loss ratios are then adjusted to the permissible loss ratio for each group total.

(g) The excess or deficiency of premiums is then determined by dividing the adjusted losses for risks under $500 and for risks of $500 and over by the permissible loss ratio and subtracting the result from the total premium at full proposed rates. This indicates the amount by which premiums on risks under $500 must be increased which, of course, equals the amount by which premiums on risks of $500 and over must be decreased, to equalize the loss ratios of the two groups of risks within each industry group at the permissible loss ratio for the state as a whole.

(h) The number of risks under $500 and the number of risks of $500 and over within each industry group, is then determined by adding the number of full term policies to the number of short term policies adjusted to a full term basis. The adjustment of the short term policies is accomplished by decreasing the number of policies by a factor measuring the total length of the short term policy periods as related to the total length of the standard one-year policy term on the same number of policies.

II — The indicated off-balance of the Experience Rating Plan is then determined by industry group from tabulations based on ratings effective July 1, 1938 to June 30, 1939, in which are shown the subject premium, expected losses, and the adjusted losses. The division of the adjusted losses by the expected losses produces the percentage of modification produced by the Experience Rating Plan during the period in question. The indications are as follows:

Industry Group	Percent of Credit Off-Balance
Manufacturing	2.91
Contracting	8.26
Federal	3.01
Servants—Per Capita	.40 (Debit)
All Other	6.17
Total All Groups (Weighted)	5.30

III — The average credibility of all risks subject to experience

rating covering ratings effective from July 1, 1938 to June 30, 1939, is next calculated by industry group.

(a) The risks are tabulated by size groups and the normal and excess ratios are shown for each size group.

(b) The average normal and excess ratio for all size groups contained in each industry group, is determined by multiplying the normal and excess ratios respectively by the total unweighted premium shown on the actual ratings for each size group, and dividing the total of the normal and excess unweighted premiums respectively, by the total of the total unweighted premiums.

(c) The actual number of risks is tabulated for each size group within each industry group and the total for each industry group is arrived at by summation.

(d) The average risk unweighted premium for each size group is then determined in total, and for normal and excess, by dividing the number of risks into the total, normal and excess unweighted premiums as previously determined.

(e) The credibility factors (Z_n and Z_e) are then determined for the average risk in each premium size group and are weighted by multiplying these credibility factors by the normal and excess unweighted premiums respectively. These products are then summed for all groups and are divided by the total of the normal and excess unweighted premiums to arrive at the average normal and excess credibility for each industry group.

(f) The average credibility for normal and excess respectively, is then weighted by the average normal and excess ratios to arrive at the average credibility (Z) for each industry group.

IV — It is now necessary to determine the effect of the change in the medical excess ratio from .25 to .35, on the average credibility. It can be easily demonstrated mathematically that the revised average credibility is equal to the originally determined average credibility minus the product of the excess of the average normal credibility over the average excess credibility, multiplied by the change in medical excess ratio times the ratio of the medical losses incurred to the total losses incurred. This is proven by the formulæ shown for the determination of the effect of changing the medical excess ratio in Appendix A, Part 2. We, therefore, proceed as follows in determining the revised average credibility:

(a) The statutory medical coverage losses for each industry group, as determined in Exhibit 5, Sheet 1, are compared with the total losses incurred from the same source and

the product is multiplied by the change in the medical excess ratio (10%) to determine the effect of the change in medical excess ratio on the total losses incurred.

(b) The average credibility, normal, excess and total, is then entered and the revised average credibility is determined by the formula as outlined above.

V — Loss constants and offsetting adjustment factors based on experience of policy years 1934, 1935 and 1936 combined are now calculated.

(a) The details of this calculation are shown in Exhibit 10, of the 1939 Rate Revision Calculations, as revised May 3, 1939.

(b) The full premium at proposed rates for risks of $500 annual premium or over, and the indicated excess premium on such risks, separately for each industry group, are taken from Exhibit 5, Sheet 1, of the 1939 Rate Revision Calculations. It should be noted at this point, that where the Actuarial Committee adopted different loss constants than those indicated by the original calculations, it was necessary to force the indicated excess premium so that the adopted loss constant would be reproduced.

(c) We next determine the value of "*e*" as used in the formulæ for the calculation of offsetting reductions as set forth in Appendix A, attached. In the appendix, the formula value shown, is "1 — *e*," but the value of "*e*" shown in the actual calculations is, of course, merely the complement of the formula value. This value is determined by dividing the adopted excess (where the adopted excess differs from the indicated excess, as explained above) by the full premium at proposed rates and subtracting the result from unity. The resulting value of "*e*" is the direct reduction factor necessary to reproduce the permissible loss ratio for the risks with premiums of $500 or more per annum, if no loss constants were to be introduced or no off-balance of the Experience Rating Plan had to be considered.

(d) We next enter:

1. The offsetting adjustment factors (*a*) used in the July 1, 1938 rates.
2. The average credibility (*Z*), as originally determined.
3. The average credibility reflecting the change in the medical excess ratio (Z_r).
4. The 1938-1939 credit off-balance of the Experience Rating Plan (*b*).

The determination of all the above values, except last year's offsetting adjustment, has been described previously.

(e) The 1938-1939 credit off-balance of the Experience Rating Plan must then be adjusted to reflect the change in the average credibility brought about by the increase in the medical excess ratio. Again it is easy to demonstrate mathematically that this change will be equal to the original off-balance plus the revised average credibility minus the original average credibility.

(f) For purposes of computation, we then deduct from the revised average credibility the amount of the revised 1938-1939 credit off-balance.

(g) It is next necessary to remove from the estimated 1938-1939 credit off-balance, the effect of the offsetting adjustment in the 1938 rates. This is done in accordance with Formula I, as shown in Appendix A, by deducting from the revised average credibility, the excess of the revised average credibility over the revised off-balance, multiplied by the offsetting adjustment included in the July 1, 1938 rates.

(h) We may then determine from Formula II, the indicated offsetting adjustment (a_2) for the revised rates. Formula II demonstrates mathematically that this offsetting adjustment is produced by dividing the sum of the value of "e" and the estimated 1938-1939 credit off-balance, if there had been no offsetting adjustment in July 1, 1938 rates, reduced by the value of the revised average credibility, by the complement of the revised average credibility. This produces a factor by which the rates on risks producing an annual premium of $500 or more, must be reduced (in conjunction with the reduction for the expected off-balance of the Experience Rating Plan) to equalize the loss ratios of risks of this size with the loss ratios for risks with annual premiums of less than $500, when loss constants are collected on the latter type of risks.

(i) We now determine the expected credit off-balance of the Experience Rating Plan under the revised rates (b_2). This is determined by Formula III as shown in Appendix A, and is arrived at by deducting from the revised average credibility, the product of the ratio of the old offsetting adjustments in the July 1, 1938 rates and the adopted offsetting adjustments in the revised July 1, 1939 rates, and the excess of the revised average credibility over the revised off-balance. The complement of the expected credit off-balance produces a factor which measures the ratio of the premium which will actually be produced by the operation of the Experience Rating Plan to that which would be produced if the Plan achieved an exact balance.

(j) We then proceed with the calculation of the indicated loss constants by applying the offsetting adjustment for the revised July 1, 1939 rates to the full premiums for risks under $500, as shown in Exhibit 5, adding the amount of the resulting premium adjustment to the previously determined premium deficiency, and dividing the sum by the total number of risks under $500 for each industry group. The result is the indicated loss constant.

(k) We must then test the indicated loss constant to determine whether or not it contains a provision of at least $5.00 for administration and payroll audit expenses plus the loading for acquisition and taxes on the premium produced by the provision for these expenses. This is done by comparing 11½% of the indicated constant with a flat item of $5.00, and adding the excess, if any, of the $5.00 item to the indicated loss constant. This, in effect, merely guarantees that the adopted loss and expense constant will include at least $5.00 to cover the expenses of Home Office administration and payroll audit plus the loading for acquisition and taxes thereon. The indicated constants are then rounded to the nearest dollar.

(l) We now determine the premium realized from the constants by multiplying the rounded loss and expense constants by the number of risks subject thereto. The additional premium produced by the minimum expense constant of $5.00 and the rounding off of the constants is determined by subtracting the required premium from the premium actually realized. The total premium to be realized from rates less the excess premium over that required from loss constants, is then determined by multiplying premiums at full proposed rates for risks of $500 and over, by the offsetting adjustment and by the final modification due to the off-balance of the Experience Rating Plan, adding thereto the full premium on risks under $500 as reduced by the offsetting adjustment factor and then subtracting the excess premium due to the $5.00 expense constant and the rounding of the loss and expense constant. The provision for losses is determined by using 60% of the above figure after the additional premium from the $5.00 expense constant and rounding has been added back. The division of the losses so determined by the premiums, indicates the permissible loss ratio, which is .606 and which has been rounded to .605.

(m) A comparison of the New York expense loading with the general permissible (.60 ÷ .605) indicates a factor of .9917

to translate from the 60% loss ratio level to the 60.5% loss ratio level.

(n) It is then necessary to test the calculations to ascertain that the loss ratios of the two premium size groups within each industry group have been properly equalized by the loss and expense constants and the offsetting reductions when combined with the expected off-balance of the Experience Rating Plan. This we do by combining the premium for risks under $500 as reduced by the offsetting adjustment, times the factor of .9917 to adjust to the loss ratio level of 60.5%, with the premium realized from loss and expense constants, and dividing this premium into the losses for such risks. We similarly determine the premium for risks over $500 by taking the full premium at proposed rates and multiplying in the offsetting reductions, the Experience Rating Plan modification, and the factor of .9917 for the expense loading adjustment, and compare these premiums with the losses of the risks involved. The test indicates for all groups, an adjusted loss ratio of 58.7% for risks under $500, a corresponding loss ratio of 60.5% for risks over $500, and a total for all risks of 59.9%. It will thus be seen that the loss and expense constants and the offsetting reductions have practically equalized the loss ratios of the two premium size groups in the aggregate. In considering the loss ratio differential remaining between the two size groups, as indicated by the above test, it must be remembered that the expense constant has the effect of depressing the loss ratio on small risks to some extent.

We have now determined both the aggregate rate level changes and the adjustments necessary to apportion this rate level change equitably between experience rated risks and non-experience rated risks. We must now determine the multipliers to be applied to the selected pure premiums to translate them into terms of final manual rates. This is accomplished by the following steps:

The National Council's test of the *selected* pure premiums, as described in Part II, produces the following ratios to the pure premiums underlying existing rates:

Manufacturing	.924
Contracting	.919
Federal	.947
Servants Per Capita	1.019
All Other	.911
Total	.919

However, the above figures exclude the factor of 1.012, which should be included in the rates to provide for the payments to the stock and mutual security funds. We, therefore, divide the foregoing figures by the factor of 1.012, arriving at the following results:

Manufacturing	.913
Contracting	.908
Federal	.936
Servants Per Capita	1.007
All Other	.900
Total	.908

The index of the new collectible rate level, which is .925, divided by the index of .908, indicated from the adjusted National Council test, produces a factor of 1.019 to adjust the selected pure premiums to the adopted rate level. The indicated change in the collectible rate level is determined by multiplying the foregoing factor (1.019) by the National Council test figures adjusted for the security fund loading. This produces the following results:

Manufacturing	.930
Contracting	.925
Federal	.954
Servants Per Capita	1.026
All Other	.917
Total	.925

The indicated change in the printed manual rate level is determined by multiplying the indicated change in the collectible rate level, as given above, by the new offsetting adjustment factors for loss constants and dividing the product by the old offsetting adjustment factors for loss constants. This produces the following indicated change in the printed manual rate level:

Manufacturing	.901
Contracting	.954
Federal	.954
Servants Per Capita	1.026
All Other	.927
Total	.927

The pure premium multipliers are determined by applying the factor of 1.019 to the offsetting adjustment factors con-

tained in the new rates. This produces the following pure premium multipliers:

Manufacturing	.972
Contracting	1.046
Federal	1.019
Servants Per Capita	1.019
All Other	.976
Total	—

However, the enactment of Chapter 512, Laws of 1939, reducing the rate of interest discount to be used in determining the value of cases compensated on the basis of life pensions from 3½% to 3%, causes an increase in loss cost of .7% over all. However, the law amendment factor, by the direction of the Actuarial Committee, is calculated so that it will apply to serious pure premiums only. The effect on serious pure premiums is found to be 2.4%. Therefore, the multipliers quoted above, are used for non-serious and medical pure premiums and the following multipliers are used for serious pure premiums only:

Manufacturing	.995
Contracting	1.071
Federal	1.043
Servants Per Capita	1.043
All Other	.999
Total	—

The following is the formula for translating selected pure premiums directly into terms of final rates:

$$\frac{\text{Selected P.P.'s} \times \text{Final P.P. Multipliers}}{.605} + \$.01 \text{ Catastrophe Loading} + 1\% \text{ General* O.D. Loading} = \text{Final Rate}$$

Appendix B, attached, shows the calculation of the rate for Class No. 2501—Clothing Manufacturing—starting with the actual experience as reported to the Compensation Insurance Rating Board, and ending with the final printed manual rate, and also contains two suggestions for refinements in the ratemaking procedure which the writer feels may result in more accurate rates.

The reader will note references in this paper to various exhibits, memoranda, and calculations forming parts of the 1939 Revision. These may be referred to by those interested, in the offices of the Compensation Insurance Rating Board. They are not reproduced here because of their voluminous character.

*Limited to not less than $.01 and not more than $.05.

APPENDIX A

Part 1

CALCULATION OF LOSS CONSTANTS AND OFFSETTING ADJUSTMENT FACTORS — CAHILL'S FORMULAE

(1.05 Factor Retained in Loss Modification Factors of Experience Rating Plan)

SYMBOLS:

Z = average credibility ($Z = R\,Z_n + (1 - R)\,Z_e$. See formulæ for change in Medical Excess Ratio).

A = actual losses · 1.05 on Experience Rated Risks. (July 1, 1938 to 1939).

E = expected losses on Experience Rated Risks (July 1, 1938 to 1939).

b = actual credit off-balance (July 1, 1938 to 1939).

a = offsetting adjustment factor in July 1, 1938 Manual rates.

E_1 = E adjusted to eliminate effect of a.

b_1 = b adjusted to eliminate effect of a.

a_2 = offsetting adjustment factor in revised rates (July 1, 1939).

E_2 = E_1 adjusted to include effect of a_2.

P_2 = full premium at proposed rates for risks over \$500.

Exc. = excess premium produced for risks over \$500.

$1 - e$ = excess ratio (ratio of excess premium produced for risks over \$500 to full premium at proposed rates for risks over \$500).

b_2 = expected credit off-balance of Experience Rating Plan for revised (July 1, 1939) rates.

$$b = Z\left(1 - \frac{A}{E}\right) = Z - Z\,\frac{A}{E}$$

$$Z - b = Z\,\frac{A}{E}$$

$$E_1 = \frac{E}{a}$$

$$b_1 = Z\left(1 - \frac{A}{E_1}\right) = Z - Z\,\frac{A}{E_1} = Z - \left(Z\,\frac{A}{E}\right)\ a$$

$$\boxed{b_1 = Z - (Z - b)\, a}$$ FORMULA I

$$1 - e = \frac{\text{Exc.}}{P_2}$$

$$E_2 = E_1\, a_2 = \frac{E}{a}\, a^2 = E\, \frac{a^2}{a}$$

$$P_2 - \text{Exc.} = (P_2\, a_2)\left(1 - Z(1 - \frac{A}{E_2})\right) = P_2\, a_2 - P_2\, a_2\, Z + P_2\, a_2\, Z \frac{A}{E_2}$$

$$= P_2\, a_2\, (1-Z) + P_2\, a_2\, Z\, \frac{A}{E_2} = P_2\, a_2$$

$$(1-Z) + P_2\, a_2\, \frac{a}{a_2}\left(Z \frac{A}{E}\right)$$

$$P_2 - (P_2 - P_2\, e) = P_2\, a_2\, (1 - Z) + P_2\, a_2\, \frac{a}{a_2}\left(Z \frac{A}{E}\right)$$

Dividing by P_2

$$1 - (1-e) = a_2\, (1-Z) + a\, \left(Z \frac{A}{E}\right)$$

$$1 - (1-e) = a_2\, (1-Z) + (a)\, (Z-b) = a_2\, (1-Z) + Z - b_1$$

$$a_2\, (1-Z) = 1 - (1-e) - Z + b_1.$$

$$\boxed{a_2 = \frac{e - Z + b_1}{1 - Z}}$$ FORMULA II

$$b_2 = Z\left(1 - \frac{A}{E_2}\right) = Z - Z\, \frac{A}{E_2} = Z - \left(Z \frac{A}{E}\right) \frac{a}{a_2}$$

$$\boxed{b_2 = Z - (Z - b)\, \frac{a}{a_2}}$$ FORMULA III

APPENDIX A

Part 2

CAHILL'S FORMULA FOR EFFECT OF CHANGING MEDICAL EXCESS RATIO FROM .25 TO .35

SYMBOLS:

R = average normal ratio when medical excess ratio was .25.

D = change in average normal ratio when medical excess ratio is increased to .35.

subscript $_r$ designates revised value reflecting change in average normal ratio.

Other symbols used are the usual symbols employed in the Experience Rating Plan, as follows:

Z_n and Z_e = Normal and Excess Credibility Factors.

P = Total Unweighted Premium Subject to Experience Rating.

K_n and K_e = Normal and Excess Constants.

Also refer to symbols used in Appendix A, Part 1.

$$\text{Now } Z_n = \frac{P \cdot R}{P \cdot R + K_n} \text{ and } Z_e = \frac{P\,(1-R)}{P\,(1-R) + K_e}$$

$$\text{also } K_n = 1000 \cdot R\left(\frac{1350}{150 \cdot .605} - 1\right) \text{and } K_e = 1000\,(1-R)\left(\frac{5850}{50 \cdot .605} - 1\right)$$

As R (or $1 - R$) is a common factor to all terms of the Z_n (or Z_e) formulæ, any change in the value of R will not affect the values of Z_n and Z_e separately. However, the value of $Z = Z_n R + Z_e\,(1 - R)$ will be changed because of the increased weight given to Z_e and the decreased weight given to Z_n.

In the following formulæ, Z_n, Z_e, Z and Z_r are averages by industry group and are not specific values for individual risk sizes.

$$Z = Z_n R + Z_e\,(1-R)$$

$$Z_r = (R-D)\,Z_n + (1-R+D)\,Z_e$$

$$\therefore \boxed{Z_r = Z - D\,(Z_n - Z_e)}$$

$$\text{also } 1-b = \frac{A_n Z_n + E R(1-Z_n) + A_e Z_e + E(1-R)(1-Z_e)}{E}$$

$$\text{and } 1-b_r = \frac{A_n Z_n + E(R-D)(1-Z_n) + A_e Z_e + E(1-R+D)(1-Z_e)}{E}$$

$$b - b_r = \frac{E(R-D)(1-Z_n) - E R(1-Z_n) + E(1-R+D)(1-Z_e) - E(1-R)(1-Z_e)}{E}$$

$$= \frac{-E D (1-Z_n) + E D (1-Z_e)}{E} = -D(1-Z_n) + D(1-Z_e)$$

$$= -D + D Z_n + D - D Z_e = D(Z_n - Z_e)$$

$$b_r = b - D(Z_n - Z_e)$$

and $\boxed{b_r = b + Z_r - Z}$ or $Z_r - b_r = Z - b.$

The same reasoning applies for values of b_1 and b_{1r}.

Appendix B

Calculation of Manual Rate Effective July 1, 1939 for Classification No. 2501—Clothing Manufacturer

As an example of the employment of the ratemaking method described in the foregoing paper, the calculation of the rate for classification No. 2501—Clothing Manufacturing—is detailed below together with brief comments on an adjustment which it is believed should be made in the calculations to produce a truer and more equitable result.

The calculations are as follows:

Element	ACTUAL LOSSES AND PAYROLLS REPORTED BY CARRIERS									
	(1) P. Y. 1932 4th Report		(2) P. Y. 1933 4th Report		(3) P. Y. 1934 3rd Report		(4) P. Y. 1935 2nd Report		(5) P. Y. 1936 1st Report	
	No.	Amount	No.	Amount	No.	Amount	No.	Amount	No.	Amount
Death	4	28,465	3	34,842	9	58,395	8	63,707	5	25,572
Permanent Total	2	21,937	..	..	..	..	2	36,220	..	..
Major	19	66,919	15	69,522	23	83,159	19	62,544	21	68,175
Minor	224	107,370	256	95,285	328	123,567	369	165,271	458	193,910
Temporary	3,167	240,051	2,904	204,032	2,337	192,847	2,117	191,407	2,088	222,610
Unadjusted Medical*		339,771		354,163		363,554		391,314		422,471
Adjusted Medical**		355,558		367,585		380,093		409,260		441,209
Total Losses— Medical Unadjusted		804,513		757,844		821,522		910,463		932,738
Total Losses— Medical Adjusted		820,300		771,266		838,061		928,409		951,476
Payroll—Full Medical		119,999,239		178,043,332		214,466,523		229,093,637		269,531,098
Payroll—Ex-Medical		5,575,540		6,747,659		9,756,504		10,506,693		11,954,972
Payroll—Total		125,574,779		184,790,991		224,223,027		239,600,330		281,486,070

APPENDIX B — *Continued*

Element	AMENDMENT, DEVELOPMENT AND PROJECTION FACTORS									
	(6) 1932		(7) 1933		(8) 1934		(9) 1935		(10) 1936	
	Amend.	Proj.	Amend.	Proj.	Amend.	D. & P.	Amend.	D. & P.	Amend.	D. & P.
Death	1.009	.928	1.001	.984	1.000	1.043	1.000	1.055	1.000	1.072
Permanent Total	1.069	.928	1.088	.984	1.010	1.043	1.000	1.055	1.000	1.072
Major	1.050	.928	1.037	.984	1.035	1.043	1.005	1.055	1.000	1.072
Minor	1.051	.928	1.038	.984	1.035	1.043	1.005	1.055	1.000	1.072
Temporary	1.027	.928	1.027	.984	1.023	1.043	1.003	1.055	1.000	1.072
Unadjusted Medical	1.000	.902	1.000	.946	1.000	1.047	1.000	1.034	1.000	1.029
Adjusted Medical	1.000	.902	1.000	.946	1.000	1.047	1.000	1.034	1.000	1.029

APPENDIX B — *Continued*

Element	EXPERIENCE AS IN CLASSIFICATION EXPERIENCE EXHIBITS						
	(11) 1932 (1) × (6)	(12) 1933 (2) × (7)	(13) 1934 (3) × (8)	(14) 1935 (4) × (9)	(15) 1936 (5) × (10)	(16) 1932 - 1936 (11)+(12)+(13)+(14)+(15)	(17) Indicated Pure Premium
Death	26,653	34,319	60,906	67,211	27,413	216,502	
Permanent Total	21,763	..	..	38,212	..	59,975	
Major	65,206	70,940	89,771	66,314	73,084	365,315	
Total Serious	113,622	105,259	150,677	171,737	100,497	641,792	.06 (.061)
Minor	104,721	97,324	133,391	175,232	207,871	718,539	
Temporary	228,782	206,188	205,765	202,540	238,638	1,081,913	
Total Non-Serious	333,503	303,512	339,156	377,772	446,509	1,800,452	.17 (.171)
Unadjusted Medical*	306,473	335,038	380,641	404,619	434,723	1,861,494	.18 (.176)
Adjusted Medical**	320,713	347,735	397,957	423,175	454,004	1,943,584	.18 (.184)
Total Losses— Medical Unadjusted	753,598	743,809	870,474	954,128	981,729	4,303,738	.41 (.408)
Total Losses— Medical Adjusted	767,838	756,506	887,790	972,684	1,001,010	4,385,828	.. (.416)
Payroll Total	125,754,8—	184,791,0—	224,223,0—	239,600,3—	281,486,1—	1,055,675,2—	

APPENDIX B — *Continued*

	Serious	Non-Serious	Medical (Unadjusted)	Medical (Adjusted)	Total (Medical Unadjusted)	Total (Medical Adjusted)
(18) Selected Pure Premiums (Col. 17)..	.06 (.061)	.17 (.171)	.18 (.176)	.. (.184)	.41 (.408)	.. (.416)
(19) Multipliers to Final Collectible Level	.995	.972	.972	.972		
(20) Product (18) × (19).....	.060 (.061)	.165 (.166)	.175 (.171)	.. (.179)	.40 (.398)	(.406)
(21) Same Loaded for Expenses $\frac{(20)}{.605}$	.. ..	.. ..	.. ..	.. ..	.66 (.658)	(.671)
(22) Same plus Catastrophe Loading (21) + .01.....					.67 (.668)	(.681)
(23) Same plus General O. D. Loading (22) × 1.01 ***.....					.68 (.678)	(.691)
(24) Final Rate (Column 23 rounded)...					.68 (.68)	(.69)

* No adjustment was made by the National Council in the amount of the medical losses to allow for medical losses eliminated on Ex-Medical coverage. The Council makes such an adjustment only in classifications where the Ex-Medical payroll constitutes more than 10% of the total payroll.

** Suggested adjustment formula, used in this exhibit, is as follows: $\frac{\text{Unadjusted Medical}}{\text{Payroll Full Medical}}$. Payroll Total = Adjusted Medical.

*** General O. D. Loading is 1%, limited, however, to not less than .01 and not more than .05.

NOTE: Figures in parentheses are computed to three decimal places.

It will be noted that two figures have been shown under the caption "Indicated Pure Premium" for each of the pure premium divisions—serious, non-serious and medical. Also medical losses and pure premiums have been shown on two bases—unadjusted and adjusted and the total losses and pure premiums have been shown with medical unadjusted and with medical adjusted. The reasons for these extra figures are as follows:

(1) Part of the experience of classification No. 2501 is on an ex-medical basis, therefore, it follows that, if this experience is to be used in determining full coverage medical pure premiums, an adjustment should be made to project the medical losses to a full coverage basis. The National Council on Compensation Insurance, which calculates the pure premiums, does not make this adjustment except in those classifications in which the ex-medical exposure constitutes more than 10% of the total exposure. As the ex-medical exposure in this classification is somewhat less than 5% of the total, no adjustment has been made. However, this classification is an extremely important one in the State of New York, producing more than one billion dollars in payroll for the five year experience period. The medical losses have, therefore, been adjusted in accordance with the following formula and new medical pure premiums have been derived on the basis of such adjusted losses:

$$\frac{\text{Unadjusted Medical}}{\text{Payroll Full Medical}} \cdot \text{Payroll Total} = \text{Adjusted Medical}$$

While the adjustment does not produce any change in the final pure premium if each of the partial pure premiums (serious, non-serious and medical) is rounded to the nearest cent, the actual difference caused by the adjustment is $.008 on the medical pure premium. This will be further discussed in point (2) following.

(2) In calculating pure premiums for large self-rating classifications (such as the one under discussion) where the pure premiums are $.50 or less, it is submitted that such indicated pure premiums should be figured to the nearest tenth of a cent instead of to the nearest cent, as is the present practice. It will be observed from the pure premiums shown in parentheses in the "Indicated Pure Premium" column, that had the pure premiums for this classification been computed to the nearest tenth of a cent, and had the medical losses been adjusted as suggested, the final rate would have been $.69 instead of $.68. While at first glance,

> this may seem unimportant, it will be observed that, based on the payrolls of policy year 1936, an addition of 1¢ to the Clothing Manufacturing rate would have produced an additional premium of more than $28,000 for the insurance carriers of the state, and over the five year experience period, the additional premiums would have been in excess of $105,000. In view of the steadily increasing payroll of this classification as indicated by the experience, the loss in premium at the present time may be considerably greater than $28,000 per annum.

It is therefore suggested that pure premiums on low rated classes (classes developing a total indicated pure premium of $.50 or less) be computed to the nearest tenth of a cent rather than to the nearest cent. It may be that all classification pure premiums should be computed to the nearest tenth of a cent, but the combination of computing pure premiums to the nearest tenth of a cent in low rated classes, and adjusting ex-medical experience to a full coverage basis in all classes, should be productive of more accurate and more representative pure premiums.

After pure premiums have been selected, the multipliers to the final collectible rate level are applied to the partial pure premiums selected and the total of these items is loaded for expenses. A flat catastrophe loading of 1¢ is then added and to this total, is added the general occupational disease loading of 1% of such figure, limited, however, to not less than 1¢ and not more than 5¢. The result, rounded to two places, is the final classification rate.

MERIT RATING — THE PROPOSED MULTI-SPLIT EXPERIENCE RATING PLAN AND THE PRESENT EXPERIENCE RATING PLAN

BY

J. J. SMICK

INTRODUCTION

The title of this paper and the paper itself are perhaps longer than they should be. The original purpose was to bring before the Society and those interested in the subject of merit rating the plan generally known as the "Multi-Split Rating Plan"; but as the multi-split plan was designed to replace the present plan and as the final decision as to its adoption is still being considered, both plans must be presented and discussed. In the course of the discussion it will be necessary to criticize the present plan. This procedure may resemble that of setting up a dummy opponent and then knocking him over. If so, there would be only an element of justice for thus far the multi-split plan has been on the receiving end. A proper appraisal of the proposed plan can hardly be made without discussing the plan it is intended to supplant. Simply to explain the proposed plan, showing its logic and operation, does not seem to be sufficient.

As a matter of record and for those not familiar with the subject a brief review may prove helpful. On May 21, 1936, the Rates Committee of the National Council on Compensation Insurance requested "the Actuarial Committee to make a critical review of the present experience rating plan and report its findings to the Rates Committee at the earliest possible date." The Actuarial Committee, utilizing the facilities and affiliations of the National Council completed a thorough study and investigation of the experience rating plan.

NOTE: The membership of the Committee was in the main composed of Messrs. Dorweiler, Barber, Perryman, Ginsburgh and Constable, all members of the Society. Mr. Yount and Mr. Forrest represented the Liberty Mutual Insurance Company. In addition, Messrs. Kormes, Hipp and Sinnott attended many of the meetings. Messrs. Skelding, Marshall, Williams and Smick of

the National Council Staff were present and participated. At one time or another each contributed to the study. As a result of discussion on one of the points Mr. Perryman wrote a paper "Experience Rating Plan Credibilities" which appeared in Volume XXIV. To Mr. Barber goes the credit for the "Multi-Split" treatment of losses.

Meetings were held at frequent intervals, and in the interim studies, exhibits and analyses were made at the National Council, the boards and bureaus, and the home offices of the companies. The amount of work performed was prodigious. Much of it could possibly have been avoided, but the Committee felt that it was desirable to make a complete analysis and left few points uncovered. Punch cards, transcribed from the detailed reports required under the unit statistical plan, made available a wealth of data for the actuary and statistician. With the carte blanche authority given to the Committee by the resolution of the Rates Committee, and the vast accumulation of punch card data available, the Actuarial Committee wallowed in exhibits. It was an actuarial dream of heaven which may possibly never again be repeated.

On January 5, 1939, the Actuarial Committee submitted to the Rates Committee its report entitled "Study and Investigation of the Experience Rating Plan." The Actuarial Committee recommended that a new plan be adopted. The principal features of this plan and comparison with the present plan are shown on Exhibit A. Two meetings of the Rates Committee have been held to consider the subject, but no decision has as yet been reached. The benefits to be derived from it may not be fully appreciated, while the inconvenience of changing has been emphatically stressed.

It has been pointed out that under the present procedure whenever there is a general revision of rates, almost the equivalent of a complete change in the Experience Rating Plan is effected; new modifications are calculated on the basis of the revised rates and rating values. The rating values usually change to a very marked extent; new average values, new modification factors for actual losses and for expected losses and for credibility values are issued. The reluctance to change plans is therefore not an insurmountable obstacle. Consciously or unconsciously, distrust of the new plan and unfamiliarity with its procedure seem to have an undue effect in producing a hesitation either to adopt or reject the plan in its entirety.

A summary view of the essential points of difference between the present plan and the proposed plan is presented in the following table:

TABLE A

Comparison of Provisions of Present and Proposed Experience Rating Plans

PRESENT PLAN	MULTI-SPLIT PLAN
Eligibility Requirements	
(1) An average annual premium of at least $500 for the last two years of the experience period.	(1) The states are divided into three groups for qualification purposes. For the first group an average annual premium of at least $300 for the last two years of the experience period is required. For the second group the corresponding requirement is $400, and for the third group $500.
Experience Period	
(1) Five years with weights of .40, .60, .80, 1.00 and 1.00.	(1) Three years with uniform weights of 1.00, in other words, an unweighted plan.

PRESENT PLAN	MULTI-SPLIT PLAN
TREATMENT OF ACTUAL LOSSES	
(1) Death and permanent total cases used at average value.	(1) Death and permanent total cases used at average value.
(2) Other cases limited to death and permanent total average value.	(2) Other cases limited to death and permanent total average value.
(3) Indemnity and medical treated separately.	(3) Indemnity and medical combined and treated as a unit.
(4) Indemnity losses split into normal and excess at the point 50 times the maximum weekly compensation provided by the Act. Medical split into normal and excess at the $100 point.	(4) Total losses (indemnity and medical combined) on each claim are discounted by dividing each claim into a series of $300 units (or $400 or $500 units, depending upon the particular group to which the state is assigned) and discounting the successive units in geometrical progression. In practice, the primary value (i.e., the discounted value corresponding to the actual value) will be shown in Table I of the Plan.
(5) Actual losses converted to present law and medical cost level by "loss modification factors."	(5) Loss modification factors not applied to actual losses. Effect of amendments taken care of in calculation of expected losses.
DETERMINATION OF EXPECTED LOSSES	
(1) Risk payrolls are reverted back to the level of previous policy years by average "payroll factors" and the corresponding expected losses are determined by applying the current manual rates and then unloading for expenses. No recognition of differences by industry group is made.	(1) Current manual rates, unloaded for expenses, are reverted back to the level of previous policy years and the corresponding expected losses are determined by application of the resulting "expected loss rates" (which will be shown in Table II of the Plan). The reversion of the current manual rates recognizes differences by industry groups.
(2) Expected losses are split into normal and excess by application of classification excess ratios.	(2) Expected losses are discounted (corresponding to the discount of actual losses) by application of classification discount ratios.

PRESENT PLAN	MULTI-SPLIT PLAN
DETERMINATION OF RISK CREDIBILITY AND MODIFICATION	
(1) Credibility determined separately for normal and excess portions by the formula $Z = \frac{P}{P+K}$, where K is a constant so determined that the maximum charge resulting from a single claim shall not exceed 20% on an average split premium basis and the maximum charge from a single claim which does not exceed the normal value shall not exceed 15%, both on $1000 unweighted subject premium.	(1) A stabilizing element, or ballast factor, is added to both the primary actual and expected losses. This value is so calculated that the maximum charge resulting from a single claim shall not exceed 25% for a risk producing a subject premium equal to three times the average annual premium required for eligibility.
(2) Mod. $= \frac{A_n Z_n + A_e Z_e + E_n(1-Z_n) + E_e(1-Z_e)}{E_n + E_e}$ Values of Z_n and Z_e are shown in Table E.	(2) Mod. $= \frac{A_p + B + W \cdot A_e}{E_p + B + W \cdot E_e}$ Values of W and B will be shown in Table III of the Plan. For risks with expected losses less than twice the average D. & P. T. value, $W = 0$ and B is a constant. Therefore, for the great majority of risks Mod. $= \frac{A_p + B}{E_p + B}$
(3) Self rating on the normal side at $100,000 total subject premium and on the excess side at $200,000 total subject premium.	(3) Self rating when undiscounted expected losses equal twenty times the state average D. & P. T. values.

GENERAL CONSIDERATIONS

Before considering some of the criticisms of the present plan, and the need for remedying certain weaknesses, it is perhaps wise to review some of the objectives of a well constructed plan and the problems that arise in connection with its application. On the basis of such a review we can more easily see the difficulties and the short-comings of any merit-rating plan as well as gauge the extent to which success has been obtained or has expectation of attainment with a new plan.

In the first place a merit rating plan applies to a great many risks operating under diverse conditions and involving activities

ranging from those in which the hazards of injury are of negligible importance to those in which the hazard is almost uninsurable. Each state has its own compensation law, its own scale of benefits, its own interpretations, and its own rates. The sizes of the risks vary from those with only a few employees to those with thousands of employees. The medical claims range from the mere removal of a cinder from an eye to treatment of an injury requiring permanent attendance of nurse and costing thousands of dollars. The indemnity claims may amount to a few dollars in one case and in another a life pension of $25 a week. Consequently, it can be seen that there are many difficulties inherent in the problem of devising a plan to fit so many conditions.

When we consider what the plan is intended to do, we run into additional complications. For the risk with little exposure about all that can be expected is to have the rate reflect favorable experience to a slight degree and to impress the fact upon the assured that the occurrence of losses causes a charge, but not a heavy one. For the large risk it is important to have the plan measure the hazards as closely as possible and give prompt and immediate encouragement to all efforts to reduce accidents, either by reduced rates for favorable experience or added charges for bad experience. Thus the plan must provide for small charges and credits for some risks and large ones for others. If the plan is too responsive to the risk's own experience, its insurance features play a decreasing role. If the plan has little responsiveness its merit rating and beneficial effects may be lessened. If for the sake of stability a long period of time is used in the experience period, then the effect of recent experience must have a secondary role. If a short period of time is used, violent fluctuations from year to year may occur. Constantly the proper course must be selected between Scylla and Charybdis.

The present plan to a certain extent accomplishes all of these functions. The importance of the size of the risk is recognized by having increasing credibility assigned on the basis of size of risk. Self rating is recognized at $100,000 normal and $200,000 excess premium subject. Eligibility for rating is established at $500 annual premium. The effect of the size of an individual loss is recognized by splitting losses into normal and excess, a separate normal for indemnity and another one for medical. The effect of

certain infrequent losses is minimized by the use of average values for death and permanent total disability cases. Stability is reached by using the long experience period of five years. Responsiveness is obtained by giving increased weight to the later years. Where then can criticism of the plan be found, and how can the plan be improved? That in essence was the problem facing the men who made the study.

Present Plan — Deficiencies

Responsiveness

The present plan is generally recognized as not being sufficiently responsive. In 1928 an attempt was made to make it more responsive, by introducing the principle of weighting. This helped the situation somewhat, and in view of the unfavorable experience that developed in the years from 1929 through 1934, there was relatively little pressure from the insuring employers toward making it more responsive. Of course, had the plan been more responsive, the underwriting situation might perhaps have been more favorable. There was little agitation for any change until the favorable experience of more recent years began to appear. To ameliorate the situation a rather drastic change in the rating procedure was advocated and adopted, but only after a bitter partisan conflict between stock and non-stock carriers. I refer to the plan known as the retrospective rating plan,[2] advocated by the stock companies. This plan, which is optional with both carrier and assured, applies only to few risks, generally those with at least $5,000 annual premium, but the group for which there is keen competition. These risks are the larger ones and if they desire can often escape what they consider unfair rating practices by self-insuring.

An increase in responsiveness seems desirable. This must be obtained without introducing elements which may cause severe

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Note: The retrospective rating plan is an extremely responsive instrument. A full description of it is contained in Mr. Pinney's article "The Retrospective Rating Plan for Workmen's Compensation Risks," Volume XXIV.

variation in rates from year to year. Furthermore, for smaller risks there is need to limit the effect and to achieve if possible some stability. The difficulties presented by the problem undoubtedly led to limiting the application of the retrospective plan to the larger risks. If some modification can be made which will achieve the desired results in the experience rating plan as a whole, then certainly such a change should be adopted.

Another objection that has been raised, and which is to a certain extent tied up with the question of responsiveness, has to do with the length of the experience period. With the five year experience period in the present plan a loss is used in the rating five successive times. Conditions causing unfavorable experience are discovered and often remedied long before the experience ceases to affect the rating. The assured and the carrier are faced with a condition, in which both know that the risk is now greatly improved and yet rates higher than warranted are being paid and may continue to be paid for a number of years. The situation is, of course, equally likely to be reversed, and the earlier years may be the favorable ones. Complaints against the operation of the plan are not as likely to occur in such instances.

Eligibility

An objection to the eligibility standards of the present plan has also been raised. On the basis of higher wages and higher rates an employer with only a few employees may be eligible for experience rating in New York. An employer with the same number of employees may be ineligible in Alabama. It is true that in the smaller premium-size groups experience rating has relatively slight effect; nevertheless the feeling on the part of the public and supervisory authorities is that more risks should be eligible for rating. In this connection it is well to remember that at one time the eligibility requirements were much lower, but were raised, partly in order to reduce the expense of administering the plan, and partly to recognize the effect of higher rate levels. The objection is also pertinent for larger risks where an employer in one state is entitled to self rating while in another state an employer with the same number of employees is not. It is diffi-

cult to defend the eligibility basis used in the present plan and in a number of jurisdictions the authorities have ordered that eligibility requirements be lowered so as to extend the benefits of the plan to a greater number of risks.

Lack of Flexibility

Another criticism of the present plan is the basis on which the values for rating have been established. For example, a normal indemnity loss is defined as 50 times the maximum weekly compensation. This definition allows a normal loss of $1,250 in a state such as New York and also in a state such as South Carolina. A much larger percentage of losses amount to less than $1,250 in South Carolina than in New York. Obviously, there is little defense for such a segregation of losses into normal and excess. The same holds true for the use of a medical normal limit of $100. Certainly the same medical services cannot be obtained for $100 in all states. In defense of the procedure one can say that values were selected on the basis of practicability.

When the plan was originally adopted, the statistical methods of reporting data were not as detailed as they now are, and the rating elements in the plan had to be selected with these limitations in mind. On the basis of what we now know, it is possible to adjust many values in the interest of theoretical and practical considerations. Unfortunately the rules in many instances are inflexible and do not permit of automatic changes, now known to be desirable on the basis of statistics as well as underwriting judgment. The plan is so constructed that such changes may not be made without actually amending important features.

Simplicity

Almost everyone recognizes that a more simple plan could be evolved. A tabular plan was suggested a few years ago. The present plan is certainly not designed to fit the smaller risks. It requires segregation of actual losses into normal and excess, both

for indemnity and medical, segregation of expected losses into normal and excess, assignment of credibility to actual normal and excess, to expected normal and excess and the combination of all these elements in order to arrive at a final modification. For the majority of risks much of the procedure is merely a useless gesture, theoretically correct but of little practical value. All this detail is of practical value only for the larger risks. Even then it was the fact that the plan did not fit the larger risks as well as might be expected which caused the introduction of the retrospective rating plan and which led the Rates Committee to inaugurate the study now under discussion.

Basis of Reserves

One other point that may be considered is the matter of incurred cost estimates. Often only a small percentage of the total cost of a case has actually been paid at the time the rating is performed. The incurred cost may be a matter of judgment, and controversies continuously arise on case estimates. There is a crying need for rectification of this situation, both to give relief from the reserves established on a judgment basis by the carrier, and to give the carrier relief from complaints on the subject and consequently the tendency to avoid the issue by underestimating reserves. An indeterminate reserve table has often been advocated as a remedy. However, in the absence of such a table, and even with such a table, a procedure should be devised which should eliminate such estimates as a source of argument.

Advisability of Change

The above points are not merely raised for the sake of polemics. They seriously affect the rating procedure and workmen's compensation insurance. The development of the retrospective rating plan was the best evidence of the need to supplement the individual risk rating procedure. Several states in order to allow more risks to be rated have cut in half the minimum premium required for eligibility. Two states have adopted a modification in the use of average values for death and permanent total disability cases. One state has operated satisfactorily under a

weighted four-year plan for many years and would certainly not increase the period to five years. In another state special consideration was given to the desirability of a three-year period and the use of the current policy in rating. Those upon whom the duty of defending the existing procedure devolved have had a tremendous advantage in that attacks are sporadic and not integrated, and also in the fact that those criticizing the plan could suggest no remedial measures.

For many years technical knowledge concerning the operations of experience rating has been held almost solely by the companies. An insuring employer has had little basis for comparing the results and methods now in use with any other methods, unless he has been willing to make a study of the subject in insurance literature. This may soon be changed. The social security program, and in particular the unemployment compensation acts are now part of our industrial structure. Many of these laws include merit rating procedures and plans. I do not believe that any actuary, or at least any casualty actuary, could have been consulted in the formulation of the majority of these plans, for they are clumsy and amateurish efforts, full of loopholes; but they are extremely simple and this very simplicity may make them popular. (None of these plans has yet been tested extensively. When their faults become apparent to employers and those in charge of their administration, they may be amended.)

If the merit rating procedure in the unemployment compensation acts proves acceptable, as it undoubtedly will to most employers, we may well expect unfavorable comparisons and adverse criticism of the cumbersome and complicated procedure now followed in experience rating workmen's compensation risks. It might be wise to anticipate this eventuality, and forestall outside interference, lest such plans as are in effect for the unemployment compensation acts be suggested for workmen's compensation insurance.

The proposed multi-split plan although not going as far toward correcting some of the deficiencies, nevertheless goes a long way toward improving the experience rating procedure. It must be remembered that the plan was constructed by a group of men and that many of the provisions represent a compromise of their views. Some may argue that the present plan could be amended to reach

the same objectives. Those familiar with the plan would hesitate to subscribe to these views. The present plan has done about all that could be expected of it. I do not believe that we could change a part here and there and obtain satisfactory results. The present plan can be amended only in unimportant respects. The various elements are too closely interrelated to allow for much experimentation. If the eligibility requirements are reduced, the amount of work and expense involved in rating small risks under the present procedure is not commensurate with the results produced. If the experience period is reduced and the weights removed, credibility must be increased and even then the results may not prove acceptable. Any change, though trivial, may cause much greater changes elsewhere in the structure of the plan. An attempt to recognize group rate levels under the present plan, though possible, would cause an increase in the work and time required for rating risks.

The proposed plan, in addition to attaining many of the objectives now desired, has the added advantage of being a flexible instrument, much more so than is the present. The plan is constructed so that important features may be modified, without causing great changes elsewhere. The proposed plan is simpler to start with and may be simplified even further. The rating values are calculated much more accurately, industry group rate levels are recognized, and, if desired, group off-balance factors may be injected. A novel and vastly improved technique for treating losses has been devised. These improvements, important as they are, only foreshadow the inherent possibilities of further improvement.

Extensive tests have been made of the proposed plan and the results found to be satisfactory. Risks were rated in Georgia, Massachusetts and New York and the results of the ratings compared with those produced under the present plan. The average effect is not much different from that produced by the present plan. These tests also indicate that in those cases where a marked difference in results is produced as respects individual risks, the results produced by the multi-split plan are more equitable when the individual risk experience was more closely analyzed in order to determine the reasons for the difference. In other words, if the new plan gave higher or lower rates, the character of the losses or

the recent experience easily justified the change. The following table presents the summary of the tests:

TABLE B

COMPARISON OF RESULTS PRODUCED BY MULTI-SPLIT PLAN AND PRESENT EXPERIENCE RATING PLAN

State	No. of Risks	Expected Losses Multi-Split Plan Three Year Subject Period	Average Modification		Ratio Multi-Split to Present
			Present Plan	Multi-Split Plan	
Georgia	436(1)	998541	.980	.962	.981
Mass.	1571(2)	4682333	.930	.927	.997
New York ...	1541(3)	4874073	.964	.975	1.011
N. Y. Special.	133(4)	4287996	.903	.918	1.017

Note (1) Ratings becoming effective between April 1, 1937 and March 31, 1938
(2) Ratings becoming effective in January 1938 and July 1938
(3) Ratings becoming effective in July 1937
(4) Special study on large risks only (Expected losses over $13,500)

A detailed analysis of these tests, showing the results for individual states, is included in Appendix I.

ADVANTAGES OF THE PROPOSED PLAN TO THE UNDERWRITERS

Since the plan was proposed by an Actuarial Committee it is safe to say that it must appeal to the actuary. The underwriter may face somewhat different problems. The plan is, for the reasons about to be given, a much better plan from the underwriting viewpoint.

For the underwriter the proposed plan offers manifold advantages. Once the novelty of the plan has worn off and the terms and processes become familiar, so that the underwriter is certain of his ground, there can be no doubt but that he will like it.

The plan is advantageous in that it gives a better measure of the rate for the risk than does the present plan. The latest three years of the experience period are used and the earlier years are discarded. Under the present plan, a rating effective January 1, 1940, includes the following experience:

Policy Year	Policy Issued Effective
1938	Jan. 1, 1938
1937	Jan. 1, 1937
1936	Jan. 1, 1936
1935	Jan. 1, 1935
1934	Jan. 1, 1934

Policy year 1934 first entered the rating effective January 1, 1936. Surely, if the risk was a poor one at that time, safety engineering and inspection work have not required five years to remedy conditions in the plant. Under the present plan the experience of policy year 1934 still affects the rating. With the proposed three year plan, only the more recent experience will affect the rating. A loss will be used in three successive ratings, as compared with five in the present plan.

Secondly, much greater emphasis is given to the frequency of accidents than is possible under the present five year plan. At present up to the normal maximum it matters little as to what type of loss enters the rating. Thus in New York, any case up to $1,250 has as much effect as 25 cases at $50 each. Obviously, a risk producing 25 accidents is a much less desirable one, other things being equal, than one producing only a single accident during the period even though the net cost is the same. The underwriter in deciding on the acceptability of the risk may, therefore, not rely entirely on the modification, but has to break down the experience into its component parts. The number and character of the losses has to be reviewed to see whether the losses are composed of a few fortuitous cases or of many minor ones. Furthermore, on many of the smaller risks the excess losses, which in reality have very little meaning, play a significant role in determining the final modification.

The proposed multi-split plan eliminates much of this. The earlier years are eliminated from the rating. For the later years, the emphasis will be on frequency rather than severity. Thus the $1,250 case will have a primary rating value of $950 while the 25 cases at $50 will have a rating value of $1,250 and will increase the modification appreciably.

The rating will be performed much more quickly and simply. Three years of experience are used in place of five. All of the steps are performed on one face of the rating form, are easily carried out and are almost self-explanatory. The loss modification, expected loss, and payroll factors have been eliminated. Such factors are often a cause of suspicion and distrust to the assured, and are difficult to explain. The values on the proposed plan have been selected so that in less than one out of ten cases will reference be made to the table of primary rating values. The primary

rating value is invariably less than the actual so that even when it is used, there can be no difficulty in justifying the procedure to the assured. Reserves for case estimates may be properly established with less fear of controversy over the amount. For the majority of risks only the "B" value is added to the losses and as this is also added to the expected, an obvious balance is maintained, easily perceived by the assured. All claims are treated as a whole and not subdivided as under the present plan so that explanations as to why medical is treated differently are avoided.

A Non-Technical Explanation of the Multi-Split Plan

In explaining the plan I shall borrow freely from a memorandum previously prepared for distribution to underwriters, fieldmen and executives, and designed as a non-technical presentation of the subject. A technical interpretation will be made later. A summary of the principal features is contained in Table A.

The allowable departure, which determines the credit for good experience or the charge for poor experience will be based on a comparison of the individual employer's experience with that indicated by the manual rates. The basic insurance rate will be increased or decreased in accordance with the influence exerted by the insurance record of the employer for the 36 month period preceding the current policy. This means that the rate for the insurance policy about to be obtained will depend upon the record for the latest available three years. The current policy year is not included as it has not been completed and the experience is, therefore, not yet available. Of course, this last year will automatically be included in a subsequent rating. The actual data to be used will be the amount of payroll allocated to the proper classifications of industry under which the employer operated, as disclosed from the results of inspection and payroll audits, and the itemized record of accidents, and their cost, as maintained in the claim files of the insurance carriers. These data will be compiled and reported to the rating organization and from these basic data the appropriate adjustment in rates will be determined. Those familiar with the administration of workmen's compensation insurance know that in rate-regulated states it does not matter whether the

employer has been insured by one or several carriers during this period, as each carrier reports the data for the period and operations for which it extended insurance to the administrative bureau in charge. An employer subject to merit rating can therefore neither escape the penalty for poor experience nor be deprived of the credit for good experience by reason of a change in insurance carriers.

Although the past record of the employer is of considerable importance in determining future insurance rates, sound insurance principles require that the amount of influence exerted by the record must be determined by the relative size of the risk. Thus there are many employers who, during any given year or period of years, do not have a single accident. These are generally employers whose operations are not very extensive in scope, when measured by the number of employees engaged by them. It would be truly phenomenal to have such a situation occur for a large employer with many activities and thousands of employees. Accordingly, the record of the employer will be allowed to play a progressively increasing role as the size of his operations increases and as the law of large numbers permits more and more advantage to be taken of the averages and more reliability to be assigned to the indications. Any employer whose operations are large enough to develop over the period a premium at current manual rates sufficient to pay for the cost of twenty death and permanent total disability cases, at the average cost of such cases, will be allowed to have his rate based entirely on his insurance record. This process is usually called self-rating and the point at which, on the basis of premium size, this procedure takes effect, is called the point of self-rating.

At the self-rating point the employer's operations are considered large enough to have his rate determined entirely on the basis of his own insurance record. Below this point the plan will allow the employer to have the advantage of the stabilizing effect of averaging his record with that of the other employers and so will provide a cushion to lessen the effect of an adverse accident or series of accidents. This cushioning effect will increase as the need for it increases, so that on the smallest employer subject to merit rating, i.e., one developing the minimum annual premium qualifying him for merit rating, in most cases $300, the effect of a

serious case will be slight. In general the maximum effect of the costliest accident that might occur is limited to a 25% effect, equivalent to the increase of a $300 premium by $75. On the other hand, the case will be included at its full effect in the rating of employers who are subject to self-rating. Between these limits the effect of any single case will vary according to the size of the employer's operations, as determined by the premium involved.

The most important factor affecting the final rate will be the occurrence of accidents. The severity of the injury as determined from the cost of compensation and medical treatment will play a secondary role. The claim costs of the accidents will be included exactly as shown in the claim record, except that on any claim on which the total incurred cost was over $300 the full amount will not be used in the rating, but a lesser amount will be used, called a primary loss. This discount will increase as the cost of any case increases so that the maximum cost case will never exceed $900 on a discounted basis. This is three times the initial value of $300. The initial value or point at which the discounting of losses begins was picked so that 90% of all compensable cases, that is cases on which some amount in addition to medical treatment has been paid, will be less than $300 and so will be used exactly as reported. If, for any state, the distribution of cases is such that less than 90% of the cases are under $300, then the initial value is raised to $400 or $500, as needed, and the maximum discounted value of $900 is correspondingly increased to $1,200 or $1,500. The discounted values will be obtained from tables, prepared in advance, but, as was previously explained, reference to the tables will be made only if the case exceeds the initial value of $300. This will occur in only one claim out of ten, so that the primary table will not be used to any great extent. Death and permanent total disability cases will be used at state-wide average value; other cases will be used at actual cost, but limited to the average value of death and permanent total disability cases.

This discounting of individual cases is one of the new and important features of the plan and gives rise to the term "Multi-Split Plan." The severity of the accident as measured by the claim cost is also important but the plan is designed to emphasize the relative frequency of accidents rather than their cost. The discounting process achieves this by including the low cost cases

at their actual value and the higher cost cases at only part of their full claim cost. As the cost of the cases increases, the amount of discount increases, and proportionately less of the actual claim cost is included in the rating at the primary value. Thus a case with an incurred cost of $1,000 will be included at a primary value of $670, while one of $2,000 will be included at $840.

From both the insurer's and the employer's viewpoint it is highly desirable to limit the importance of the monetary cost of a case. In general, it is the number of accidents occurring that determines the characteristic conditions in a plant. Occasionally a fortuitous high-cost case occurs, which may cost more than a score of minor accidents. Nevertheless one case should not be allowed to affect unduly the insurance rate of the employer. It is the purpose of the discounting procedure to minimize the effect of the relatively infrequent but costly claims.

In order to simplify the actual process of rating and the task of recording the data, the indemnity and medical payments are to be combined. As no adjustments on claim costs are to be made, other than that of using primary values when needed, this procedure is feasible.

In order to determine whether the employer's record is better or worse than average, it is necessary to determine an average. Obviously since there are thousands of employers, each with many different operations, it is extremely difficult to find risks comparable in conditions with those of a particular employer and which could be taken as "average." Recourse is therefore had to a simple procedure for establishing an average with which may be compared the record of an individual employer. The data with respect to payrolls and classifications of operations, applying to the risk under consideration, are used, and the total charge for insurance for the period is determined, on the basis of the rates established to be the required average over the period. These rates are known as they are compiled from statistical data reported for the purpose of establishing average manual rates. With these average rates as a base, the total amount required for insurance on the basis of average conditions, for the particular employer under consideration, is easily ascertained.

The procedure outlined in the preceding paragraphs establishes

the total charge for insurance on the basis of the individual employer's operations and average charges. A number of adjustments must be made in order to determine what would be the average amount and distribution of losses. This is known as obtaining "expected losses." In the premium charge are included provisions for expenses as well as payments for compensation and medical services. The provision for expenses should be eliminated since it is desired to compare only claim costs. As the features within the employer's control are the factors causing accidents, and as the cost is to some extent dependent on factors definitely not within his control, as for example, benefit provisions of the compensation acts, adjustments must be made for law amendments and similar features. Furthermore, since in many cases a considerable amount of the cost of the claims is not used in the rating, because of the discounting feature and the use of only the primary portion of the loss, the amount available for claims on the basis of average rates must be similarly discounted and primary expected losses obtained. This is done by means of average discounts determined for the state as a whole for the particular classification of industry. With these adjustments the remaining average charge is truly comparable with the claim cost of the employer as disclosed by the records.

A direct comparison of the actual claim cost with the indications for average conditions may show a tremendous variation and give cause to violent fluctuations in rates. This condition has already been pointed out to some extent under the discussion of partial and complete self-rating and in the explanation of the limitation that not more than a 25% increase in rate or a charge of $75 may be caused by the inclusion of the most costly case for an employer who just qualifies for rating under the plan. To accomplish this limitation and to cushion the effect of fluctuations, stabilizing elements (designated as B values) are added in such a way as to limit the charge to 25% and at the same time, as the magnitude of the employers' operations increases, allow his record a gradually increasing part in establishing the rate. These stabilizing elements may be considered as a mere artificial enlargement of the scope of an employer's operations. In order to obtain stability in the results, the stabilizing element is added alike to the sum representing the average conditions and to the sum of the

actual claim cost determined and designated as primary losses. The resulting comparison of the actual claim cost, inclusive of the stabilizing element, with the average claim cost, also inclusive of the stabilizing element, represents the amount of departure allowed to the employer.

Although the above procedure applies to the vast majority of employers, the stabilizing effect of the "B" value is not needed for those employers whose premium is sufficient to qualify them for self-rating. Neither is it as necessary to discount the claims for such employers, using only the primary values, since the occurrence of a high cost case does not have so marked an effect upon the rates of such large employers as it does on the rates of smaller ones. Consequently it is possible to eliminate from the rating procedure the discounting process and the addition of the stabilizing element. In order, however, that all employers shall be treated in a manner reasonably uniform, and to avoid sharp transitional points, it is desirable to eliminate these elements, not abruptly, but by degrees. If this is not done, an abrupt change of treatment may occur, and an employer who just qualifies for self-rating will receive treatment materially different from one who fails of qualification by a single dollar. A process is, therefore, introduced into the plan which gradually cuts down the amount of the stabilizing element, and gradually brings in the portion of the claim cost called "excess" loss, previously not used, by reason of the discounting procedure and use of only primary loss values. This modification, as has been pointed out, is entirely sound because as the employer's operations progressively increase in magnitude, his record begins to develop a certain stability of its own, and even the higher-cost cases begin to have a characteristic representative of the employer's operations. At the point where the premium size is 1/10 of that required for self-rating, or just sufficient to pay for the cost of two average death and permanent total disability cases, some of the losses previously not used enter the rating, and, at the point where complete self-rating becomes effective, all of these losses are used. The procedure will be to obtain the stabilizing element (the B value) from a table which will contain the appropriate values for the particular size indicated by the employer's records. These stabilizing elements will ultimately reduce in amount until at the point of complete self-

rating they will drop out of the picture. At the same time that the stabilizing element is obtained from the tables, another factor will be obtained called a "W" value which will allow a percentage of the claim cost, previously unused because of the discounting procedure, to be included in the rating. This percentage or "W" value will increase by 1% intervals until at the point of complete self-rating all of the previously unused claim cost will be included in the rating and the "W" value will be 100% while the "B" value will be zero.

Technical Aspects of the Plan

It is my intention now to present some of the formulæ and mathematical concepts underlying the plan as well as outline the procedure followed in the calculation of the various rating values.

The principal feature of the multi-split plan is the method of treating losses on the so-called multi-split principle. The theory is simple; each loss is divided into a series of intervals and each interval is discounted by the application of factors, obtained from the terms of a geometric progression. Instead of discounting each individual loss a table of rating values is prepared in advance so that by referring to the table the discounted or primary value may be obtained for any given loss. The total incurred cost of a case is used, medical being combined with indemnity. The construction of the table of primary rating values is as follows:

Let s = primary rating value.
a = initial value, also interval used in splitting losses.
r = discount ratio.
L = actual loss.

1. Then $s = a + ar + ar^2 + ar^3 + \cdots ar^{n-1}$.

2. Expressed as the sum of a geometric progression to n terms,

$$s = \frac{a - ar^n}{1 - r} \text{ or } \frac{a(1 - r^n)}{1 - r}.$$

3. Let S = sum when n approaches infinity.

$$S = \frac{a}{1 - r}.$$

4. Substituting in (2) $s = S(1 - r^n)$.

5. Whence $r^n = 1 - \frac{s}{S}$

6. Taking the logarithm, $n \log r = \log\left(1 - \frac{s}{S}\right)$

   but $n =$ number of intervals or $\frac{L}{a}$.

7. Therefore $L = \frac{a \log\left(1 - \frac{s}{S}\right)}{\log r}$.

It may be seen from the above formula that, for each primary rating value there is some actual undiscounted loss value. The table is constructed so that the primary values are at even intervals of $10. The actual loss values are calculated to correspond to the given primary value. By examining the calculation attached (Exhibit II) for the Primary Table based on an initial value of $300 and a discount ratio of .667 we see that for a primary rating value (Col. 2) of $405, the undiscounted value is $443 and for a primary rating value of $415 the undiscounted value is $458. Therefore for a tabular rating value (Col. 1) of $410, (the midpoint between $405 and $415) the actual undiscounted loss must be a minimum of $443 to correspond with the lower point of the interval for which $410 is the midpoint and $457 to correspond to the upper point of the interval for which $410 is the midpoint. The table is built up on this basis.

The use of midpoints causes an obvious practical difficulty in the first few values of the table. For instance it is possible to have the primary rating value greater than the actual undiscounted loss. Thus for a primary rating value of $315 the actual corresponding undiscounted value is $319. For a primary rating value of $325 the actual undiscounted value is $332. If we now establish a primary rating value of $320 as the midpoint all actual losses lying between $319 and $332 take $320 as the primary rating value. If the loss is just $319 the primary rating value is $320, slightly greater than the actual. To adjust this condition the following values were adopted:

$300 Table		$400 Table		$500 Table	
Actual Loss	Rating Value	Actual Loss	Rating Value	Actual Loss	Rating Value
Up to $300	Actual	Up to $400	Actual	Up to $500	Actual
301 - 305	300	401 - 405	400	501 - 505	500
306 - 310	305	406 - 410	405	506 - 510	505
311 - 315	310	411 - 415	410	511 - 515	510
316 - 320	315	416 - 420	415	516 - 520	515
321 - 331	320	421 - 431	420	521 - 531	520
332 - 344	330	432 - 443	430	532 - 544	530
345 - 357	340	444 - 457	440	545 - 556	540
Etc. as per original table.		Etc. as per original table.		Etc. as per original table.	

Attached as Exhibits I and II are tables of Primary Rating values and the calculations underlying them. The values actually adopted were as follows:

Exhibit I	Initial Value — I	Discount Ratio — r
Table IA	300	.667
Table IB	400	.667
Table IC	500	.667

[1] *The Credibility Values "B" and "W"*

The rating formula adopted was of the form

$$\text{Modification} = \frac{A_p + B + W A_e}{E_p + B + W E_e}$$

where A_p and E_p represent the primary actual and primary expected losses respectively and A_e and E_e represent the excess actual and excess expected losses. B and W are credibility values, obtained from an auxiliary table. For risks with subject premium equal to or exceeding 10% of the premium required for self-rating the above formula holds. By arbitrarily setting $W = 0$ below this point the formula for risks with a lesser subject premium simplifies to

$$\text{Modification} = \frac{A_p + B}{E_p + B}$$

(1) NOTE: The reader is referred to Mr. Perryman's paper "Experience Rating Plan Credibilities," *Proceedings*, Volume XXIV for a detailed discussion of the subject.

the last term of the numerator and denominator dropping out so that excess losses need not be considered.

The W value follows a straight line at 1% intervals and is 100% at the self-rating point. At 10% of the self-rating point the value of W is zero. Furthermore, the "B" value is constant below this point and is calculated so that an accident may not produce more than a 25% effect on a minimum size risk or a risk which over the experience period of three years develops a subject premium equal to three times the initial value. The mathematical formulæ involved are as follows:

Let A_e = Total actual loss minus discounted actual loss.
E_e = Total expected loss minus discounted expected loss.
E = Total expected loss.
M = Maximum discounted loss.
I = Initial value.
L = Expected loss ratio.
D = State average discount value.
S = Self-rating point 20 times average death and permanent total value, rounded to the nearest $5,000.
Q = Point where W value is greater than zero (in this case $Q = .10\,S$.)

$$B = K_e\,(1 - W). \tag{1}$$

$$W = \frac{E - Q}{S - Q} \tag{2}$$

$$K_e = K + (g\,S - K)\,W. \tag{3}$$

g = The maximum value of $\frac{E_e}{E}$. Tests indicate a value of $g = .4$ would probably be satisfactory for all states.

$$K = 4\,M - 3\,I\,L\,D \tag{4}$$

M has been used as the sum of the progression when n in the formula $S = a\,\frac{(1 - r^n)}{1 - r}$ approaches infinity. Since all cases are to be used at the maximum on the basis of the average cost of a Death and Permanent Total Disability Case, a somewhat lower value may be used.

The actual construction of the tables is very simple, if auxiliary values are used. The procedure is as follows:

When $E = S$ $\quad W = 100\%$ and $B = 0$.
When $E = Q$ $\quad W = \ \ 0\%$ and $B = K$, a constant.

Therefore for each .01 increase in W, $\Delta E = \frac{S - Q}{99}$

Similarly $K_e = K + (g\,S - K)\,W$.

and $\Delta K_e = (g\,S - K)\,.01$. , $g = .4$

and at $E = Q$ $K_e = K = 4\,M - 3\,I\,L\,D$.

From here K_e is built up by successive addition of ΔK_e

E is built up by successive addition of ΔE

W is constant at .01 intervals and

B is obtained by multiplying K_e by $(1 - W)$.

Exhibit III shows the values for Missouri. These were obtained using the above procedure and the following basic values:

Average D and P. T. Value \$3975. $S = 80000$ $Q = 8000$

$I = 400$ $M = 1200$ $L = .60$ "D" $= .710$

$K = 4300$ $\Delta E = 727.273$ $\Delta K_e = 277$

It is also noted that the average risk credibility (Z) is the same as the credit for clear experience:

Below the Q point Average $Z = 1 - \frac{K}{E_d + K} = \frac{E_d}{E_d + K}$

Above the Q point Average $Z = 1 - \frac{B}{E_d + B + W\,E_e} = \frac{E_d + W\,E_e}{E_d + W\,E_e + B}$

Inasmuch as the W and B values vary for each state only one set will be reproduced along with the procedure followed in its calculation. This is shown in Exhibit III.

Expected Primary Losses

The calculation of expected primary losses is based on a separation of the total expected losses into primary and excess by means of a "D" ratio applicable to each classification.

The "D" ratios are obtained in somewhat the same manner as are the primary actual losses. The process involves discounting the individual losses for the state and obtaining average "D" ratios or ratios of discounted to undiscounted losses for serious, non-serious and medical. These individual ratios are then applied to the serious, non-serious and medical pure premiums to obtain the classification "D" ratio.

The calculation of "D" ratios requires a great deal of work on

the part of the rate-making organizations, particularly in view of the fact that statistics are maintained separately for indemnity and medical and the total incurred cost for both combined is nowhere available, either on the detailed original forms or on the punch cards. The ideal situation would be to have the statistical and rate-making procedure conform to the requirements of a multi-split plan.

In order to obtain discounted losses it will be necessary to modify the statistical procedure so that losses will be reported as total incurred, medical and indemnity combined, or to provide mechanical means for cross-footing the data already punched on the cards. It is my belief that the latter method will be inaugurated if the plan is adopted. Subsequently, when the value of having the total incurred cost of each claim for rating purposes becomes apparent to the carriers, the loss reporting cards will probably be changed to provide that total incurred claim costs be reported.

In the meanwhile the present procedure is as follows:

$$\text{"}D\text{"} \text{ ratio for serious losses} = \frac{(\text{Serious Indemnity} + \text{Medical}) \text{ Discounted}}{\text{Serious Indemnity}}$$

$$\text{"}D\text{"} \text{ ratio for non-serious losses} = \frac{(\text{Non-Serious Indemnity} + \text{Medical}) \text{ Discounted}}{\text{Non-Serious Indemnity}}$$

$$\text{"}D\text{"} \text{ ratio for medical losses} = \frac{(\text{Non-Compensable Medical}) \text{ Discounted}}{\text{Total Medical}}$$

For risks written on an ex-medical basis the procedure is modified as follows:

$$D_{ser} = \frac{\text{Serious Indemnity Discounted}}{\text{Serious Indemnity}}$$

$$D_{n\text{-}ser} = \frac{\text{Non-Serious Indemnity Discounted}}{\text{Non-Serious Indemnity}}$$

$$D_{med} = .20.$$

An example of the methods used in obtaining state discounted losses for use in the above formulae are shown in Exhibit IV.

Method A outlines a detailed procedure, wherein losses are tabulated in size of loss groups, the average loss in each group determined and the discounted losses obtained by applying the corresponding primary rating value. Method B is an abridged method. The intervals used for grouping losses are larger and the discounted losses are obtained by applying the primary rating values for the midpoint of the group interval. In addition to saving several steps, this method enables the use of a form on which the primary rating values for each group are imprinted. The calculation of the average state "*D*" ratios is shown in Exhibit V.

The "*D*" ratios are then weighted by the serious, non-serious and medical partial pure premiums underlying the classification rate and the average classification "*D*" ratio obtained. The state average "*D*" ratio is obtained for use in establishing the "*B*" and "*W*" values. The calculation of the classification "*D*" ratio is explained on Exhibit VI.

Calculation of Factors to Derive Expected Loss Rates

The calculation of the policy year Expected Loss Rates contemplates the recognition of industry group projection factors, law amendment factors, development factors and certain other miscellaneous factors generally used to place the raw losses on a ratemaking basis. The need for all of these factors arises from the desire to use the expected loss rate underlying the current policy year rate as the basis for determining expected losses. The actual risk losses are to be used without modifications. Accordingly, the policy year expected losses should be comparable.

On Exhibit VII is shown the derivation of a set of factors for the manufacturing group. The same procedure applies to other groups with the exception that the figures for the Rate Level Projection factors will differ. It can be easily seen that different values for the other elements may be injected for each group, if desired. The factor for the experience rating plan off-balance is constant and is the same as that in the present plan.

The expected loss factors, expressed as reciprocals, are applied to the classification rates, (unloaded for catastrophe) to obtain policy year classification expected loss rates. Exhibit VIII shows the details of this calculation.

In a number of states many risks are written on an ex-medical basis. In these cases the assured assumes the responsibility for paying the medical costs on the claims. Since most of the medical will not be included in the losses a modification in the rating procedure is required. The procedure is as follows:

1. Expected losses will be determined in the usual manner, using full medical rates.
2. Special medical "*D*" ratios will be applied.
3. (*a*) Above the *Q* point a special ex-medical multiplier will be applied to the full expected losses (undiscounted). This multiplier will be $(1.0 - 1.33 \times$ ex-medical ratio) calculated for each classification.
   (*b*) From the summation of the product of classification expected loss and special multiplier of (a) the discounted medical losses as determined in (2) will be subtracted. The remainder will be the expected ex-medical excess loss.
4. Actual losses will be discounted by the use of the regular tables of Primary Values.

Explanation of Rating Procedure

The rating form and procedure are extremely easy to follow. In addition to the identifying data the rating form is divided into four sections as follows:

Part I — Exhibit of Actual Losses

Part I is arranged so that space is available to post in one column the sum of the losses, for the rating period, that are equal to or less than the initial value and to list the cases costing in excess of the initial value. All of these will be listed in a column headed "Actual Incurred Losses." Another column will allow for the posting of the Primary Rating Value for those cases in excess of the initial value. The Primary Rating Values must be obtained from Table I. Space is provided for obtaining the Total Incurred Losses, the Total Primary Actual Losses and the difference or Actual Excess Losses.

Part II — Exhibit of Expected Losses

Part II provides space for the classification number, for the payroll exposure, for the policy year expected loss rates, for the extension of the payrolls by the rates to obtain expected losses, and for the application of the *"D"* ratio to obtain Primary Expected Losses. The totals will give Total Primary Expected Losses and the difference or Excess Expected Losses.

Part III — Rating Procedure

The Primary Actual Losses and the Primary Expected Losses are carried down from Parts I and II. The appropriate *"B"* and *"W"* values, to correspond to the Total Expected Losses are obtained from a Table of *"B"* and *"W"* values and entered. If *"W"* equals zero the excess losses may be entirely disregarded. If there is a positive *"W"* then both the Excess Actual and Excess Expected Losses are multiplied by *"W"* and added in with the other items. The modification is determined by dividing the total thus obtained for Actual by the total for Expected.

Part IV — Adjusted Rates

In a block especially provided therefor are spaces for posting the classifications and manual rates applicable to the risk for the policy about to be issued. The modification is applied to these rates after specific occupational disease and other non-ratable loadings are removed.

General Comments on the Rating Procedure

The rating form is designed so that all operations may be performed on one face of the blank, thus allowing for the use of fanfold typing machines and interleaved carbon paper. Although, usually, only three lines will be needed for posting the three policy years, space is provided to enable the rating department to post in pencil figures for the latest year at the time the risk is rerated and cross off the earliest year. The rating may then be completed and sent to the typing division.

Reference to the Primary Rating Table will only be made in

about 10% of the cases. The "B" value for expected losses below 10% of the self rating point is constant. A clerk can therefore quickly memorize these values and can post them, for the vast majority of risks, without even referring to the Tables.

Sample ratings have been performed for a large risk and a smaller risk. The expected loss rates and *"D"* ratios are for the classification used to illustrate the calculation of these values as shown on Exhibits VI and VIII. In order to make the illustrations more meaningful, the same classification is used in both risks, and it is assumed that the incurred losses are identical. The large risk is, in exposure, exactly three times the smaller one. For the large risk, the excess losses are used in the rating, and for the smaller one they are not, since the total expected losses are less than 10% of that required for self-rating.

Naturally the small risk having unfavorable experience, received a debit of 23.7%. For the larger risk the same losses may be considered as involving favorable experience and the result is indicated in a credit of 29.2%.

EXHIBIT I

TABLE IA — PRIMARY VALUES

Table of Rating Values using Multi-Split Principle

Basis: $a = 300$ $r = .667$ Losses up to $300 to be used without discount

Actual Loss	Primary Value	Actual Loss	Primary Value
Up to $300	Actual	778 - 800	590
301 - 305	300	801 - 825	600
306 - 310	305	826 - 850	610
311 - 315	310	851 - 876	620
316 - 320	315	877 - 906	630
321 - 331	320	907 - 934	640
332 - 344	330	935 - 963	650
345 - 357	340	964 - 994	660
358 - 370	350	995 - 1026	670
371 - 385	360	1027 - 1059	680
386 - 399	370	1060 - 1094	690
400 - 413	380	1095 - 1131	700
414 - 427	390	1132 - 1169	710
428 - 442	400	1170 - 1214	720
443 - 457	410	1215 - 1257	730
458 - 472	420	1258 - 1303	740
473 - 488	430	1304 - 1352	750
489 - 503	440	1353 - 1404	760
504 - 521	450	1405 - 1461	770
522 - 538	460	1462 - 1522	780
539 - 555	470	1523 - 1588	790
556 - 573	480	1589 - 1661	800
574 - 590	490	1662 - 1750	810
591 - 609	500	1751 - 1842	820
610 - 628	510	1843 - 1948	830
629 - 647	520	1949 - 2071	840
648 - 667	530	2072 - 2218	850
668 - 689	540	2219 - 2402	860
690 - 710	550	2403 - 2647	870
711 - 732	560	2648 - 3017	880
733 - 754	570	3018 - 3788	890
755 - 777	580	3789 & over	900

EXHIBIT I (*Continued*)

TABLE IB — PRIMARY VALUES

Table of Rating Values using Multi-Split Principle

Basis: $a = 400$ $r = .667$ Losses up to $400 to be used without discount

Actual Loss	Primary Value	Actual Loss	Primary Value	Actual Loss	Primary Value
Up to $400	Actual	797 - 814	670	1609 - 1649	970
401 - 405	400	815 - 835	680	1650 - 1698	980
406 - 410	405	836 - 853	690	1699 - 1743	990
411 - 415	410	854 - 872	700	1744 - 1790	1000
416 - 420	415	873 - 894	710	1791 - 1847	1010
421 - 431	420	895 - 914	720	1848 - 1899	1020
432 - 443	430	915 - 934	730	1900 - 1955	1030
444 - 457	440	935 - 957	740	1956 - 2021	1040
458 - 469	450	958 - 978	750	2022 - 2085	1050
470 - 482	460	979 - 1000	760	2086 - 2152	1060
483 - 497	470	1001 - 1025	770	2153 - 2234	1070
498 - 510	480	1026 - 1047	780	2235 - 2313	1080
511 - 523	490	1048 - 1070	790	2314 - 2399	1090
524 - 539	500	1071 - 1097	800	2400 - 2506	1100
540 - 552	510	1098 - 1121	810	2507 - 2611	1110
553 - 566	520	1122 - 1146	820	2612 - 2729	1120
567 - 582	530	1147 - 1175	830	2730 - 2882	1130
583 - 597	540	1176 - 1201	840	2883 - 3040	1140
598 - 611	550	1202 - 1228	850	3041 - 3229	1150
612 - 628	560	1229 - 1260	860	3230 - 3496	1160
629 - 643	570	1261 - 1288	870	3497 - 3814	1170
644 - 658	580	1289 - 1318	880	3815 - 4288	1180
659 - 676	590	1319 - 1352	890	4289 - 5452	1190
677 - 691	600	1353 - 1384	900	5453 & over	1200
692 - 708	610	1385 - 1417	910		
709 - 726	620	1418 - 1455	920		
727 - 743	630	1456 - 1490	930		
744 - 759	640	1491 - 1526	940		
760 - 779	650	1527 - 1569	950		
780 - 796	660	1570 - 1608	960		

EXHIBIT I (*Continued*)

TABLE IC — PRIMARY VALUES

Table of Rating Values Using Multi-Split Principle

Basis: $a = 500$ $r = .667$ Losses up to $500 to be used without discount

Actual Loss	Primary Value	Actual Loss	Primary Value	Actual Loss	Primary Value
Up to $500	Actual	967 - 985	820	1852 - 1885	1170
501 - 505	500	986 - 1004	830	1886 - 1926	1180
506 - 510	505	1005 - 1021	840	1927 - 1967	1190
511 - 515	510	1022 - 1041	850	1968 - 2004	1200
516 - 520	515	1042 - 1061	860	2005 - 2049	1210
521 - 531	520	1062 - 1079	870	2050 - 2095	1220
532 - 544	530	1080 - 1100	880	2096 - 2137	1230
545 - 556	540	1101 - 1121	890	2138 - 2187	1240
557 - 569	550	1122 - 1139	900	2188 - 2238	1250
570 - 583	560	1140 - 1161	910	2239 - 2285	1260
584 - 595	570	1162 - 1184	920	2286 - 2341	1270
596 - 609	580	1185 - 1203	930	2342 - 2400	1280
610 - 624	590	1204 - 1226	940	2401 - 2453	1290
625 - 636	600	1227 - 1250	950	2454 - 2518	1300
637 - 650	610	1251 - 1270	960	2519 - 2586	1310
651 - 665	620	1271 - 1295	970	2587 - 2648	1320
666 - 678	630	1296 - 1320	980	2649 - 2724	1330
679 - 693	640	1321 - 1342	990	2725 - 2805	1340
694 - 708	650	1343 - 1368	1000	2806 - 2879	1350
709 - 721	660	1369 - 1394	1010	2880 - 2972	1360
722 - 737	670	1395 - 1417	1020	2973 - 3071	1370
738 - 753	680	1418 - 1445	1030	3072 - 3164	1380
754 - 766	690	1446 - 1473	1040	3165 - 3282	1390
767 - 783	700	1474 - 1498	1050	3283 - 3412	1400
784 - 799	710	1499 - 1527	1060	3413 - 3535	1410
800 - 813	720	1528 - 1557	1070	3536 - 3697	1420
814 - 830	730	1558 - 1584	1080	3698 - 3883	1430
831 - 847	740	1585 - 1615	1090	3884 - 4069	1440
848 - 862	750	1616 - 1648	1100	4070 - 4328	1450
863 - 880	760	1649 - 1676	1110	4329 - 4656	1460
881 - 898	770	1677 - 1710	1120	4657 - 5029	1470
899 - 913	780	1711 - 1745	1130	5030 - 5684	1480
914 - 931	790	1746 - 1776	1140	5685 - 7170	1490
932 - 950	800	1777 - 1813	1150	7171 & over	1500
951 - 966	810	1814 - 1851	1160		

TABLE OF LIMITS OF ACTUAL LOSS AMOUNTS CORRESPONDING TO GIVEN RATING VALUES

$a = 300$

$r = .667$

$$S = \frac{a}{1-r} = 900$$

GENERAL FORMULA USED

$$\text{Actual Loss} = \frac{a \log\left(1 - \frac{s}{S}\right)}{\log r} = 1705.51 \log\left(1 - \frac{s}{900}\right)$$

(1) Rating Value s	(2) Mid-Point s	(3) $\frac{s}{900}$	(4) $1-\frac{s}{900}$	(5) $\log\left(1-\frac{s}{900}\right)$	(6) 1.0−(5)	(7) (6)×1705.51	(1) Rating Value s	(2) Mid-Point s	(3) $\frac{s}{900}$	(4) $1-\frac{s}{900}$	(5) $\log\left(1-\frac{s}{900}\right)$	(6) 1.0−(5)	(7) (6)×1705.51
300	305	.339	.661	.8202	.1798	307	610	615	.683	.317	.5011	.4989	851
10	15	.350	.650	.8129	.1871	319	20	25	.694	.306	.4857	.5143	877
20	25	.361	.639	.8055	.1945	332	30	35	.706	.294	.4683	.5317	907
30	35	.372	.628	.7980	.2020	345	40	45	.717	.283	.4518	.5482	935
40	45	.383	.617	.7903	.2097	358	50	55	.728	.272	.4346	.5654	964
50	55	.394	.606	.7825	.2175	371	60	65	.739	.261	.4166	.5834	995
60	65	.406	.594	.7738	.2262	386	70	75	.750	.250	.3979	.6021	1027
70	75	.417	.583	.7657	.2343	400	80	85	.761	.239	.3784	.6216	1060
80	85	.428	.572	.7574	.2426	414	90	95	.772	.228	.3579	.6421	1095
90	95	.439	.561	.7490	.2510	428	700	705	.783	.217	.3365	.6635	1132
400	405	.450	.550	.7404	.2596	443	10	15	.794	.206	.3139	.6861	1170
10	15	.461	.539	.7316	.2684	458	20	25	.806	.194	.2878	.7122	1215
20	25	.472	.528	.7226	.2774	473	30	35	.817	.183	.2625	.7375	1258
30	35	.483	.517	.7135	.2865	489	40	45	.828	.172	.2355	.7645	1304
40	45	.494	.506	.7042	.2958	504	50	55	.839	.161	.2068	.7932	1353
50	55	.506	.494	.6937	.3063	522	60	65	.850	.150	.1761	.8239	1405
60	65	.517	.483	.6839	.3161	539	70	75	.861	.139	.1430	.8570	1462
70	75	.528	.472	.6739	.3261	556	80	85	.872	.128	.1072	.8928	1523
80	85	.539	.461	.6637	.3363	574	90	95	.883	.117	.0682	.9318	1589
90	95	.550	.450	.6532	.3468	591	800	805	.894	.106	.0253	.9747	1662
500	505	.561	.439	.6425	.3575	610	10	15	.906	.094	.9731	*1.0269	1751
10	15	.572	.428	.6314	.3686	629	20	25	.917	.083	.9191	1.0809	1843
20	25	.583	.417	.6201	.3799	648	30	35	.928	.072	.8573	1.1427	1949
30	35	.594	.406	.6085	.3915	668	40	45	.939	.061	.7853	1.2147	2072
40	45	.606	.394	.5955	.4045	690	50	55	.950	.050	.6990	1.3010	2219
50	55	.617	.383	.5832	.4168	711	60	65	.961	.039	.5911	1.4089	2403
60	65	.628	.372	.5705	.4295	733	70	75	.972	.028	.4472	1.5528	2648
70	75	.639	.361	.5575	.4425	755	80	85	.983	.017	.2304	†1.7696	3018
80	85	.650	.350	.5441	.4559	778	90	95	.994	.006	.7782	2.2218	3789
90	95	.661	.339	.5302	.4698	801	900						
600	605	.672	.328	.5159	.4841	826							

*From here on subtract column (5) from 2.0. †Subtract column (5) from 3.0.

EXHIBIT II—(CONTINUED)

TABLE OF LIMITS OF ACTUAL LOSS AMOUNTS CORRESPONDING TO GIVEN RATING VALUES

$a = 500$

$r = .667$

GENERAL FORMULA USED

$$S = \frac{a}{1-r} = 1500 \qquad \text{Actual Loss} = \frac{a \log\left(1 - \frac{s}{S}\right)}{\log r} = 2842.52 \log\left(1 - \frac{s}{1500}\right)$$

(1) Rating Value s	(2) Mid Point s	(3) $\frac{s}{1500}$	(4) $1-\frac{s}{1500}$	(5) $\log\left(1-\frac{s}{1500}\right)$	(6) 1.0−(5)	(7) (6)×2842.52
500	505	.337	.663	.8215	.1785	507
10	15	.343	.657	.8176	.1824	518
20	25	.350	.650	.8129	.1871	532
30	35	.357	.643	.8082	.1918	545
40	45	.363	.637	.8041	.1959	557
50	55	.370	.630	.7993	.2007	570
60	65	.377	.623	.7945	.2055	584
70	75	.383	.617	.7903	.2097	596
80	85	.390	.610	.7853	.2147	610
90	95	.397	.603	.7803	.2197	625
600	605	.403	.597	.7760	.2240	637
10	15	.410	.590	.7709	.2291	651
20	25	.417	.583	.7657	.2343	666
30	35	.423	.577	.7612	.2388	679
40	45	.430	.570	.7559	.2441	694
50	55	.437	.563	.7505	.2495	709
60	65	.443	.557	.7459	.2541	722
70	75	.450	.550	.7404	.2596	738
80	85	.457	.543	.7348	.2652	754
90	95	.463	.537	.7300	.2700	767
700	705	.470	.530	.7243	.2757	784
10	15	.477	.523	.7185	.2815	800
20	25	.483	.517	.7135	.2865	814
30	35	.490	.510	.7076	.2924	831
40	45	.497	.503	.7016	.2984	848
50	55	.503	.497	.6964	.3036	863
60	65	.510	.490	.6902	.3098	881
70	75	.517	.483	.6839	.3161	899
80	85	.523	.477	.6785	.3215	914
90	95	.530	.470	.6721	.3279	932
800	805	.537	.463	.6656	.3344	951
10	15	.543	.457	.6599	.3401	967
20	25	.550	.450	.6532	.3468	986
30	35	.557	.443	.6464	.3536	1005
40	45	.563	.437	.6405	.3595	1022
50	55	.570	.430	.6335	.3665	1042
60	65	.577	.423	.6263	.3737	1062
70	75	.583	.417	.6201	.3799	1080
80	85	.590	.410	.6128	.3872	1101
90	95	.597	.403	.6053	.3947	1122
900	905	.603	.397	.5988	.4012	1140
10	15	.610	.390	.5911	.4089	1162
20	25	.617	.383	.5832	.4168	1185
30	35	.623	.377	.5763	.4237	1204
40	45	.630	.370	.5682	.4318	1227
50	55	.637	.363	.5599	.4401	1251
60	65	.643	.357	.5527	.4473	1271
70	75	.650	.350	.5441	.4559	1296
80	85	.657	.343	.5353	.4647	1321
90	95	.663	.337	.5276	.4724	1343

EXHIBIT II—(CONTINUED)

TABLE OF LIMITS OF ACTUAL LOSS AMOUNTS CORRESPONDING TO GIVEN RATING VALUES

$a = 500$

$r = .667$

GENERAL FORMULA USED

$$S = \frac{a}{1-r} = 1500 \qquad \text{Actual Loss} = \frac{a \log\left(1 - \frac{s}{S}\right)}{\log r} = 2842.52 \log\left(1 - \frac{s}{1500}\right)$$

(1) Rating Value s	(2) Mid Point s	(3) $\frac{s}{1500}$	(4) $1-\frac{s}{1500}$	(5) $\log\left(1-\frac{s}{1500}\right)$	(6) 1.0−(5)	(7) (6)×2842.52
1000	1005	.670	.330	.5185	.4815	1369
10	15	.677	.323	.5092	.4908	1395
20	25	.683	.317	.5011	.4989	1418
30	35	.690	.310	.4914	.5086	1446
40	45	.697	.303	.4814	.5186	1474
50	55	.703	.297	.4728	.5272	1499
60	65	.710	.290	.4624	.5376	1528
70	75	.717	.283	.4518	.5482	1558
80	85	.723	.277	.4425	.5575	1585
90	95	.730	.270	.4314	.5686	1616
1100	1105	.737	.263	.4200	.5800	1649
10	15	.743	.257	.4099	.5901	1677
20	25	.750	.250	.3979	.6021	1711
30	35	.757	.243	.3856	.6144	1746
40	45	.763	.237	.3747	.6253	1777
50	55	.770	.230	.3617	.6383	1814
60	65	.777	.223	.3483	.6517	1852
70	75	.783	.217	.3365	.6635	1886
80	85	.790	.210	.3222	.6778	1927
90	95	.797	.203	.3075	.6925	1968
1200	1205	.803	.197	.2945	.7055	2005
10	15	.810	.190	.2788	.7212	2050
20	25	.817	.183	.2625	.7375	2096
30	35	.823	.177	.2480	.7520	2138
40	45	.830	.170	.2304	.7696	2188
50	55	.837	.163	.2122	.7878	2239
60	65	.843	.157	.1959	.8041	2286
70	75	.850	.150	.1761	.8239	2342
80	85	.857	.143	.1553	.8447	2401
90	95	.863	.137	.1367	.8633	2454
1300	1305	.870	.130	.1139	.8861	2519
10	15	.877	.123	.0899	.9101	2587
20	25	.883	.117	.0682	.9318	2649
30	35	.890	.110	.0414	.9586	2725
40	45	.897	.103	.0128	.9872	2806
50	55	.903	.097	.9868	*1.0132	2880
60	65	.910	.090	.9542	1.0458	2973
70	75	.917	.083	.9191	1.0809	3072
80	85	.923	.077	.8865	1.1135	3165
90	95	.930	.070	.8451	1.1549	3283
1400	1405	.937	.063	.7993	1.2007	3413
10	15	.943	.057	.7559	1.2441	3536
20	25	.950	.050	.6990	1.3010	3698
30	35	.957	.043	.6335	1.3665	3884
40	45	.963	.037	.5682	1.4318	4070
50	55	.970	.030	.4771	1.5229	4329
60	65	.977	.023	.3617	1.6383	4657
70	75	.983	.017	.2304	1.7696	5030
80	85	.990	.010	.0000	2.0000	5685
90	95	.997	.003	.4771	†2.5229	7171
1500						

*Subtract column (5) from 2.0. †Subtract column (5) from 3.0.

EXHIBIT II—(CONTINUED)

TABLE OF LIMITS OF ACTUAL LOSS AMOUNTS CORRESPONDING TO GIVEN RATING VALUES

$a = 400$

$r = .667$

GENERAL FORMULA USED

$$S = \frac{a}{1-r} = 1200 \qquad \text{Actual Loss} = \frac{a \log\left(1 - \frac{s}{S}\right)}{\log r} = 2274 \log\left(1 - \frac{s}{1200}\right)$$

(1) Rating Value s	(2) Mid Point s	(3) $\frac{s}{1200}$	(4) $1-\frac{s}{1200}$	(5) $\log\left(1-\frac{s}{1200}\right)$	(6) 1.0−(5)	(7) (6)×2274
400	405	.337	.663	.8215	.1785	406
10	15	.346	.654	.8156	.1844	419
20	25	.354	.646	.8102	.1898	432
30	35	.362	.638	.8048	.1952	444
40	45	.371	.629	.7987	.2013	458
50	55	.379	.621	.7931	.2069	470
60	65	.387	.613	.7875	.2125	483
70	75	.396	.604	.7810	.2190	498
80	85	.404	.596	.7752	.2248	511
90	95	.412	.588	.7694	.2306	524
500	505	.421	.579	.7627	.2373	540
10	15	.429	.571	.7566	.2434	553
20	25	.437	.563	.7505	.2495	567
30	35	.446	.554	.7435	.2565	583
40	45	.454	.546	.7372	.2628	598
50	55	.462	.538	.7308	.2692	612
60	65	.471	.529	.7235	.2765	629
70	75	.479	.521	.7168	.2832	644
80	85	.487	.513	.7101	.2899	659
90	95	.496	.504	.7024	.2976	677
600	605	.504	.496	.6955	.3045	692
10	15	.512	.488	.6884	.3116	709
20	25	.521	.479	.6803	.3197	727
30	35	.529	.471	.6730	.3270	744
40	45	.537	.463	.6656	.3344	760
50	55	.546	.454	.6571	.3429	780
60	65	.554	.446	.6493	.3507	797
70	75	.562	.438	.6415	.3585	815
80	85	.571	.429	.6325	.3675	836
90	95	.579	.421	.6243	.3757	854
700	705	.587	.413	.6160	.3840	873
10	15	.596	.404	.6064	.3936	895
20	25	.604	.396	.5977	.4023	915
30	35	.612	.388	.5888	.4112	935
40	45	.621	.379	.5786	.4214	958
50	55	.629	.371	.5694	.4306	979
60	65	.637	.363	.5599	.4401	1001
70	75	.646	.354	.5490	.4510	1026
80	85	.654	.346	.5391	.4609	1048
90	95	.662	.338	.5289	.4711	1071
800	805	.671	.329	.5172	.4828	1098
10	15	.679	.321	.5065	.4935	1122
20	25	.687	.313	.4955	.5045	1147
30	35	.696	.304	.4829	.5171	1176
40	45	.704	.296	.4713	.5287	1202
50	55	.712	.288	.4594	.5406	1229
60	65	.721	.279	.4456	.5544	1261
70	75	.729	.271	.4330	.5670	1289
80	85	.737	.263	.4200	.5800	1319
90	95	.746	.254	.4048	.5952	1353

EXHIBIT II—(CONTINUED)

TABLE OF LIMITS OF ACTUAL LOSS AMOUNTS CORRESPONDING TO GIVEN RATING VALUES

$a = 400$

$r = .667$

GENERAL FORMULA USED

$$S = \frac{a}{1-r} = 1200 \qquad \text{Actual Loss} = \frac{a \log\left(1 - \frac{s}{S}\right)}{\log r} = 2274 \log\left(1 - \frac{s}{1200}\right)$$

(1) Rating Value s	(2) Mid Point s	(3) $\frac{s}{1200}$	(4) $1-\frac{s}{1200}$	(5) $\log\left(1-\frac{s}{1200}\right)$	(6) 1.0−(5)	(7) (6)×2274
900	905	.754	.246	.3909	.6091	1385
10	15	.762	.238	.3766	.6234	1418
20	25	.771	.229	.3598	.6402	1456
30	35	.779	.221	.3444	.6556	1491
40	45	.787	.213	.3284	.6716	1527
50	55	.796	.204	.3096	.6904	1570
60	65	.804	.196	.2923	.7077	1609
70	75	.812	.188	.2742	.7258	1650
80	85	.821	.179	.2529	.7471	1699
90	95	.829	.171	.2330	.7670	1744
1000	1005	.837	.163	.2122	.7878	1791
10	15	.846	.154	.1875	.8125	1848
20	25	.854	.146	.1644	.8356	1900
30	35	.862	.138	.1399	.8601	1956
40	45	.871	.129	.1106	.8894	2022
50	55	.879	.121	.0828	.9172	2086
60	65	.887	.113	.0531	.9469	2153
70	75	.896	.104	.0170	.9830	2235
80	85	.904	.096	.9823	*1.0177	2314
90	95	.912	.088	.9445	1.0555	2400
1100	1105	.921	.079	.8976	1.1024	2507
10	15	.929	.071	.8513	1.1487	2612
20	25	.937	.063	.7993	1.2007	2730
30	35	.946	.054	.7324	1.2676	2883
40	45	.954	.046	.6628	1.3372	3041
50	55	.962	.038	.5798	1.4202	3230
60	65	.971	.029	.4624	1.5376	3497
70	75	.979	.021	.3222	1.6778	3815
80	85	.987	.013	.1139	1.8861	4289
90	95	.996	.004	.6021	†2.3979	5453
1200						

*Subtract column (5) from 2.0.

†Subtract column (5) from 3.0.

EXHIBIT III

TABLE III — MISSOURI

"B" and "W" Values

Average D. & P. T. Value = $3975

NOTE: Use Table IB for Determining Primary Actual Losses — $400 Initial Value

Expected Losses	*W*	*B*	Expected Losses	*W*	*B*	Expected Losses	*W*	*B*
Below- 8000	.00	4300	32727-33454	.35	9097	58182-58908	.70	7107
8001- 8726	.01	4531	33455-34181	.36	9134	58909-59635	.71	6950
8727- 9454	.02	4757	34182-34908	.37	9166	59636-60363	.72	6788
9455-10181	.03	4977	34909-35635	.38	9192	60364-61090	.73	6621
10182-10908	.04	5192	35636-36363	.39	9213	61091-61817	.74	6447
10909-11635	.05	5401	36364-37090	.40	9228	61818-62544	.75	6269
11636-12363	.06	5604	37091-37817	.41	9238	62545-63272	.76	6084
12364-13090	.07	5802	37818-38544	.42	9242	63273-63999	.77	5895
13091-13817	.08	5995	38545-39272	.43	9240	64000-64726	.78	5699
13818-14544	.09	6182	39273-39999	.44	9233	64727-65454	.79	5498
14545-15272	.10	6363	40000-40726	.45	9221	65455-66181	.80	5292
15273-15999	.11	6539	40727-41454	.46	9203	66182-66908	.81	5080
16000-16726	.12	6709	41455-42181	.47	9179	66909-67635	.82	4863
16727-17454	.13	6874	42182-42908	.48	9150	67636-68363	.83	4639
17455-18181	.14	7033	42909-43635	.49	9115	68364-69090	.84	4411
18182-18908	.15	7187	43636-44363	.50	9075	69091-69817	.85	4177
18909-19635	.16	7335	44364-45090	.51	9029	69818-70544	.86	3937
19636-20363	.17	7477	45091-45817	.52	8978	70545-71272	.87	3692
20364-21090	.18	7615	45818-46544	.53	8921	71273-71999	.88	3441
21091-21817	.19	7746	46545-47272	.54	8859	72000-72726	.89	3185
21818-22544	.20	7872	47273-47999	.55	8791	72727-73454	.90	2923
22545-23272	.21	7992	48000-48726	.56	8717	73455-74181	.91	2656
23273-23999	.22	8107	48727-49454	.57	8638	74182-74908	.92	2383
24000-24726	.23	8217	49455-50181	.58	8554	74909-75635	.93	2104
24727-25454	.24	8320	50182-50908	.59	8464	75636-76363	.94	1820
25455-26181	.25	8419	50909-51635	.60	8368	76364-77090	.95	1531
26182-26908	.26	8511	51636-52363	.61	8267	77091-77817	.96	1236
26909-27635	.27	8599	52364-53090	.62	8160	77818-78544	.97	935
27636-28363	.28	8680	53091-53817	.63	8048	78545-79272	.98	629
28364-29090	.29	8756	53818-54544	.64	7930	79273-79999	.99	317
29091-29817	.30	8827	54545-55272	.65	7807	80000 & over	1.00	0
29818-30544	.31	8892	55273-55999	.66	7678			
30545-31272	.32	8952	56000-56726	.67	7543			
31273-31999	.33	9005	56727-57454	.68	7404			
32000-32726	.34	9054	57455-58181	.69	7258			

EXHIBIT IV

STATE—MASSACHUSETTS

Policy Years 1934-1935 Initial Value — $400

METHOD OF DISCOUNTING STATE ACTUAL LOSSES

DISTRIBUTION OF SERIOUS LOSSES BY SIZE — FROM UNIT STATISTICAL PLAN REPORTS

METHOD A — DETAILED PROCEDURE						METHOD B — ABRIDGED PROCEDURE				
(1) Loss Size Group	(2) No. of Cases	(3) Incurred Cost	(4) Group Average (3) ÷ (2)	(5) Primary Value	(6) Discounted Losses (2) × (5)	(1) Loss Size Group	(2) Midpoint of Group	(3) Primary Value	(4) No. of Cases	(5) Discounted Losses (3) × (4)
0- 299						0- 299	150	150		
300- 349						300- 399	350	350		
350- 399						400- 499	450	440		
400- 449						500- 599	550	510	5	2550
450- 499						600- 699	650	580	7	4060
500- 549						700- 799	750	640	12	7680
550- 599	5	2883	577	530	2650	800- 899	850	690	13	8970
600- 649	5	3078	615	560	2800	900- 999	950	740	14	10360
650- 699	2	1342	672	590	1180	1000-1099	1050	790	19	15010
700- 749	6	4337	728	630	3780	1100-1199	1150	830	26	21580
750- 799	6	4599	766	650	3900	1200-1299	1250	860	27	23220
800- 849	6	4966	827	680	4080	1300-1399	1350	890	27	24030
850- 899	7	6168	882	710	4970	1400-1499	1450	920	29	26680
900- 949	3	2717	905	720	2160	1500-1599	1550	950	34	32300
950- 999	11	10663	968	750	8250	1600-1699	1650	980	33	32340
000-1099	19	19683	1035	780	14820	1700-1799	1750	1000	34	34000
100-1199	26	29719	1144	820	21320	1800-1899	1850	1020	32	32640
200-1299	27	33701	1248	860	23220	1900-1999	1950	1030	28	28840
300-1399	27	36630	1357	900	24300	2000-2999	2500	1100	243	267300
400-1499	29	41547	1432	920	26680	3000-3999	3500	1170	531*	621270
500-1599	34	52554	1545	950	32300	4000-4999	4500	1190	82	97580
500-1699	33	54669	1656	980	32340	5000 & over		1200	117	140400
700-1799	34	58925	1735	990	33660					
300-1899	32	58835	1840	1010	32320					
900-1999	28	54405	1945	1030	28840					
000-2099	30	61073	2035	1050	31500					
100-2199	21	45032	2145	1060	22260					
200-2299	36	80946	2250	1080	38880					
300-2399	30	70383	2350	1090	32700					
400-2499	16	38810	2425	1100	17600					
500-2999	110	297888	2700	1120	123200					
000-3499	77	248768	3230	1160	89320					
500-3999	454*	1718695	3780	1170	531180					
000-4499	49	205329	4180	1180	57820					
500-4999	33	154576	4780	1190	39270					
000-5999	76	405215	5330	1190	90440					
000-6999	33	206328	6230	1200	39600					
000-7999	6	44050	7340	1200	7200					
000 & over	2	16529	8270	1200	2400					
TOTAL	1313	4075043			1426940				1313	1430810

ncludes 397 D. & P. T. cases costing $1508946, average cost of a case is $3800. All cases in excess are mited to this average so that the corresponding Primary Rating Values should be used for the remaining ses.

EXHIBIT V

CALCULATION OF DISCOUNT RATIOS — MISSOURI

Policy Years 1934-1935

	(1) Incurred Losses	(2) Discounted Losses	(3) Discount Ratio (2) ÷ (3)
Serious	1,748,363	672,383	.385
Non-Serious	2,126,082	2,692,522	1.266
Medical	1,724,776	592,940	.344
TOTAL	5,599,221	3,957,845	.710

EXHIBIT VI

CALCULATION OF CLASSIFICATION "D" RATIO

	(1) Partial Pure Premiums Underlying Rate	(2) State "D" Ratios	(3) Partial Primary Loss Rates	(4) Classification "D" Ratio (3) ÷ (1)
Serious	.41	.385	.158	
Non-Serious	.44	1.266	.557	
Medical	.40	.344	.136	
TOTAL	1.25	XX	.851	.68

EXHIBIT VII

CALCULATION OF FACTORS TO DERIVE EXPECTED LOSS RATES

STATE — MISSOURI — REVISION UNDERLYING THE RATES APPROVED DECEMBER 31, 1937

Industry Group	(1) Policy Year	(2) Off-Balance Adjustment	(3) Factors Derived from Latest Rate Revision: Benefit Changes	(4) Loss Development	(5) Rate Level Projection	(6) Contingency	(7) Expense Loading	(8) Product	(9) Reciprocal
Mfg.	1934	1.03	1.000	1.000	1.045	1.091	1.667	1.9575	.511
	1935	1.03	1.000	1.000	.974	1.091	1.667	1.8245	.548
	1936	1.03	1.000	1.000	1.000	1.091	1.667	1.8732	.534

The same procedure is followed in calculating the factors for the Contracting and All Other groups.

EXHIBIT VIII

CALCULATION OF POLICY YEAR EXPECTED LOSS RATES FOR A MANUFACTURING CLASS

Policy Year	(1) Policy Year Adjustment Factor	(2) Rate for Classification Excluding .01 for Catastrophe Losses	(3) Policy Year Expected Loss Rate (1) × (2)
1934	.511	2.19	1.12
1935	.548	2.19	1.20
1936	.534	2.19	1.17

ILLUSTRATIVE EXAMPLE #1

Note: This risk has a payroll exposure one third of that in Example #2

EXPERIENCE RATING FORM

Name of Risk Medium Risk Address

Carrier Policy No.

Rating Applicable to Operations in State of Missouri Effective Date of Rating

PART I—EXHIBIT OF ACTUAL LOSSES

			(4) Policy Year	(5) Actual* Incurred Losses	(6) Primary Actual Losses
Total by policy year of all cases $ 400 or under			34	749	749
			35	884	884
Individual cases in excess of $ 400			36	1016	1016
(1) Claim Number	(2) Kind of Injury	(3) O W			
	D		34	3975	1180
	D		35	3975	1180
	M		36	3491	1160
				(a) 14090	(b) 6169
			Totals		

(c) Actual Excess (a)—(b) 7921

PART II—EXHIBIT OF EXPECTED LOSSES

(7) Classification	(8) Policy Year	(9) Payroll	(10) Expected Loss Rate	(11) Expected Losses ((9) x (10))÷100	(12) "D" Ratio	(13) Primary Expected Losses (11) x (12)
2014	34	150,000	1.12			
	35	175,000	1.20			
	36	200,000	1.17			
				6120	.68	4162
				(c) 6120		(e) 4162
			Totals			

(f) Expected Excess (d)—(e) 1958

PART III—RATING PROCEDURE

	(14) Actual	(15) Expected
	Item (b)	Item (e)
1. Primary Losses	6169	4162
2. "R" Value (Enter in both columns)	4300	4300
3. Ratable Excess Losses: (W) % Actual Excess ; Expected Excess	0	0
	(g)	(h)
4. Totals	10469	8462

5. Experience Modification (a) 1.237 ; 23.7 % Charge; % Credit.

* Indemnity and medical combined. Primary value of each case is from Table I. Death and Permanent Total cases to be included at average value of Table III. Maximum value of all other cases to be limited to average Death and Permanent Total value.

PART IV—ADJUSTED RATES

(16) Classification	(17) Manual Rate	(18) Ratable Expense Modification	(19) Subject Rate (17)—(18)	(20) Adjusted Rate †
2014	2.20			2.721

† Col. (17) x Experience Modification. (Item 5 Part III).

If Specific O.D. or Non-Ratable Loadings [Col. (18)] apply, use formula:

[Col. (19) x Experience Modification] + Col. (18).

ILLUSTRATIVE EXAMPLE #2

This risk has a payroll exposure three times that of Example #1

EXPERIENCE RATING FORM

Name of Risk Illustrative Example of Large Risk Address

Carrier Policy No.

Rating Applicable to Operations in State of Missouri Effective Date of Rating

PART I—EXHIBIT OF ACTUAL LOSSES

Total by policy year of all cases $ 400 or under

Individual cases in excess of $ 400

(1) Claim Number	(17) Kind of Injury	(18) O.D. N.F.	(4) Policy Year	(a) Actual* Incurred Losses	(b) Primary Actual Losses
			34	749	749
			35	684	684
			36	1016	1016
	D		34	3975	1180
	D		35	3975	1180
	M		36	3491	1160
			Totals	(a) 14090	(b) 6169

(c) Actual Excess (a)−(b) 7921

PART II—EXHIBIT OF EXPECTED LOSSES

(7) Classification	(4) Policy Year	(9) Payroll	(10) Expected Loss Rate	(11) Expected Losses [(9) x (10)]÷100	(12) "D" Ratio	(13) Primary Expected Losses (11) x (12)
2014	34	450,000	1.12			
	35	525,000	1.20			
	36	600,000	1.17			
				18360	.68	12485
			Totals	(d) 18360		(e) 12485

(f) Expected Excess (d)−(e) 5875

PART III—RATING PROCEDURE

	(14) Actual	(15) Expected
	Item (b)	Item (e)
1. Primary Losses	6169	12485
2. "B." Value (Enter in both columns.)	7187	7187
3. Ratable Excess Losses: (W) .15 ¢ Actual Excess 7921 ; Expected Excess 5875	1188	881
	(g)	(h)
4. Totals	14544	20553

5. Experience Modification (g)/(h) .708 ; ¢ Charge 29.2 ¢ Credit.

* Indemnity and medical combined. Primary value of each case is from Table I. Death and Permanent Total cases to be included at average value of Table III. Maximum value of all other cases to be limited to average Death and Permanent Total value.

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PART IV—ADJUSTED RATES

(16) Classification	(17) Manual Rate	(18) Ratable O.D. or Non-Ratable Loadings	(19) Subject Rate (17) − (18)	(20) Adjusted Rate †
2014	2.20			1.558

† Col. (17) x Experience Modification. (Item 5 Part III). If Specific O.D. or Non-Ratable Loadings [Col. (18)] apply, use formula: [Col. (19) x Experience Modification] + Col. (18).

APPENDIX I

TESTS OF MULTI-SPLIT PLAN

This exhibit shows summaries comparing the results obtained by rating risks under the Multi-Split Rating Plan with the results obtained under the present plan.

The data used in making these tests are as follows:

Georgia—

436 Risks—Ratings effective April 1, 1937 to March 31, 1938

Massachusetts—

1571 Risks—Ratings effective in January 1938 and July 1938

New York—

1541 Risks—Ratings effective in July 1937
133 Large Risks (Expected Losses over 13,500)

The exhibits for each state are divided into two parts.

Part A is a general summary showing the ratio of premium produced by the multi-split plan to the premium produced by the present plan according to the type of modification under the present plan.

Part B summarizes the ratio of premium produced by the Multi-Split plan to the premium produced by the present plan according to size of expected losses for the three year experience period of the multi-split plan. The results are obtained by weighing the three-year expected losses by actual and multi-split modifications.

APPENDIX I — TESTS

GEORGIA MULTI-SPLIT RATING PLAN

Ratio of Premium Produced by Multi-Split Plan
to Premium Produced by Present Plan

PART A — SUMMARY

(1) Group	(2) No. of Risks	(3) Expected Losses (3 Year Period)	(4) Product (3) × Act. Mod.	(5) Product (3) × M-Split Mod.	(6) Ratio (5) ÷ (4)
(a)	239	535153	445601	432717	.971
(b)	160	350888	415936	419460	1.008
(c)	12	21426	20525	21952	1.070
(d)	25	91074	96774	86208	.891
TOTAL	436	998541	978836	960337	.981

Group (a) Risks which bore a credit under both rating plans.
(b) Risks which bore a debit under both rating plans.
(c) Credit risks switching to debit under multi-split plan.
(d) Debit risks switching to credit under multi-split plan.

APPENDIX I — TESTS (*Continued*)

PART B — BY SIZE OF EXPECTED LOSSES

Expected Losses Size	Number of Risks and Ratio of Multi-Split Premium to Standard					
	Credit Risks		Debit Risks		All Risks	
	No.	Ratio	No.	Ratio	No.	Ratio
0- 999	64	.993	38	1.015	102	1.002
1000-1999	117	.988	75	.992	192	.989
2000-3999	40	.980	53	1.001	93	.993
4000-6999	20	.970	11	.970	31	.970
7000-9999	5	.993	4	.904	9	.948
10000 & over	5	.918	4	.981	9	.953
ALL SIZES	251	.970	185	.986	436	.981

MASSACHUSETTS MULTI-SPLIT RATING PLAN

Ratio of Premium Produced by Multi-Split Plan to Premium Produced by Present Plan

PART A — SUMMARY

(1) Group	(2) No. of Risks	(3) Expected Losses (3 Year Period)	(4) Product (3) × Act. Mod.	(5) Product (3) × M-Split Mod.	(6) Ratio (5) ÷ (4)
(a)	918	3099584	2570488	2518968	.980
(b)	493	1182422	1385441	1414723	1.021
(c)	81	236950	230003	251516	1.094
(d)	71	135793	143051	128561	.899
(e)	8	27584	27058	27595	1.020
TOTAL	1571	4682333	4356041	4341363	.997

Group (a) Risks which bore a credit under both rating plans.
(b) Risks which bore a debit under both rating plans.
(c) Credit risks switching to debit under multi-split plan.
(d) Debit risks switching to credit under multi-split plan.
(e) Risks producing a neutral modification under either plan.

PART B — BY SIZE OF EXPECTED LOSSES

Expected Losses Size	Number of Risks and Ratio of Multi-Split Premium to Standard							
	Credit Risks		Debit Risks		Neutral Risks		All Risks	
	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio
0- 999	390	1.005	220	.996	1	.939	611	1.001
1000-1999	278	1.001	162	.991	0	..	440	.997
2000-4999	206	.999	121	1.006	1	1.021	328	1.002
5000-9999	72	1.000	41	1.040	0	..	113	1.018
10000 & over	59	.976	20	1.005	0	..	79	.982
ALL SIZES	1005	.990	564	1.009	2	1.004	1571	.997

APPENDIX I — TESTS (*Continued*)

NEW YORK MULTI-SPLIT RATING PLAN

Ratio of Premium Produced by Multi-Split Plan to Premium Produced by Present Plan

PART A — SUMMARY

(1) Group	(2) No. of Risks	(3) Expected Losses (3 Year Period)	(4) Product (3) × Act. Mod.	(5) Product (3) × M-Split Mod.	(6) Ratio (5) ÷ (4)
(a)	903	2861435	2403976	2384005	.992
(b)	524	1638182	1929962	1987472	1.030
(c)	72	253515	244954	264722	1.081
(d)	38	113970	117491	110459	.940
(e)	4	6971	6949	7002	1.008
TOTAL	1541	4874073	4703332	4753660	1.011

Group (a) Risks which produced a credit under both plans.
(b) Risks which produced a debit under both plans.
(c) Credit risks switching to debit under multi-split plan.
(d) Debit risks switching to credit under multi-split plan.
(e) Risks producing a neutral modification under either plan.

PART B — BY SIZE OF EXPECTED LOSSES

Expected Losses Size	Number of Risks and Ratio of Multi-Split Premium to Standard							
	Credit Risks		Debit Risks		Neutral Risks		All Risks	
	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio
0- 999	288	1.005	150	.999	..	..	438	1.003
1000-1999	343	1.004	208	1.013	1	1.058	552	1.008
2000-4999	209	1.006	138	1.025	2	.991	349	1.015
5000-9999	75	.999	34	1.045	..	..	109	1.016
10000 & over	61	.994	32	1.027	..	..	93	1.009
ALL SIZES	976	1.000	562	1.025	3	1.005	1541	1.011

SPECIAL TEST OF MULTI-SPLIT RATING PLAN ON NEW YORK LARGE RISKS

(Risks with Expected Losses over $13,500)

PART A — SUMMARY BY INDUSTRY GROUP

Industry Group	(1) No. of Risks	(2) Expected Losses	(3) Modified Losses Present	(4) Modified Losses Multi-Split	(5) Ratio (4) ÷ (3)
Manufacturing ..	66	1,895,491	1,734,898	1,757,061	1.013
Contracting	22	615,463	594,572	593,799	.999
All Other	45	1,777,042	1,562,578	1,584,612	1.014
TOTAL.....	133	4,287,996	3,892,048	3,935,472	1.011

*STATE MONOPOLY OF COMPENSATION INSURANCE, LABORATORY TEST OF GOVERNMENT IN BUSINESS

PART II

ANALYSIS OF THE RECENT ACTUARIAL AUDIT OF THE OHIO STATE INSURANCE FUND

BY

WINFIELD W. GREENE

The general subject of this paper was dealt with in November 1936 before this Society in an address of which the gist was as follows:

In modern times there have evolved three distinctive schools of thought as to the relation which should exist between government and economic activity, namely:—

1. *The laissez-faire,* or classical school, which holds that "economic law" should be given free play, i.e., that government should not interfere with private enterprise, as the greatest good for the greatest number is achieved through what someone has referred to as "the sum total of little greeds."
2. The school which favors private enterprise *fostered* but *controlled* by government.
3. Socialism (theoretic socialism, not necessarily identical with any existing political regime), which holds that private enterprise will destroy itself, and be supplanted by state ownership and operation of the productive mechanism.

Private enterprise *without some governmental restriction* has never existed, and evidently is not presently wanted in this country; so that the practical choice before our people is between friendly governmental regulation of private enterprise and a regime which is essentially socialistic in its objectives (whether admitting such a goal or not).

Workmen's compensation insurance affords our electorate a unique large scale laboratory test of government in business in the form of the Ohio State Insurance Fund, one of the largest carriers of workmen's compensation insurance in the country, in business for more than a quarter of a century.

Various public committees and commissions have reported grave lack of efficiency in the operation of this Fund. Nevertheless, it has been contended by its advocates, and particularly by the spokesmen of organized labor, that the "Ohio Plan" is the only one which gives the workman "a break."

* This paper is a sequel to one of identical title delivered as a presidential address to the Casualty Actuarial Society, November 13th, 1936. See also written discussions in this issue, page 187.

Further, it has been claimed that the Ohio Fund furnishes compensation insurance at a lower cost than does any other plan, thereby benefiting not only the employer but also the employee, since this saving in insurance cost is alleged to be potentially available for the benefit of the employees in the form of more liberal wage scales and other benefits.

On November 26, 1934, Woodward & Fondiller, Inc., consulting actuaries of New York, addressed to the Governor's Investigating Committee on the Workmen's Compensation Law, an "Actuarial Survey" of the Fund. This survey included an exhibit of the experience of the Fund for the years 1929-33 by industry group. Comparison of this experience with that for practically the same period in New York, New Jersey and Massachusetts (where private compensation insurance prevails with the sole exception of the competitive New York Fund) indicated that, with due allowance for difference in benefit scale, the pure compensation cost in Ohio under the monopolistic system was approximately 38% greater than was that in the three Eastern states. The gravest aspect of this abnormally high benefit cost is not the monetary loss to employers. Rather, it is the loss of life, health, income and happiness upon the part of workmen and their families.

On the evidence available, the Ohio Fund, largest of the state compensation monopolies, has failed to render efficient and equitable service to employer and employee. It has been and still may be in precarious financial condition. Directly and indirectly, it has cost the people of Ohio dearly in money, life, health and good-will. There can be no justification for any state's initiating or continuing such an experiment in the workmen's compensation field, the automobile liability field, or any other field which can be served by private insurance.

That is what I said in November, 1936.

Under date of December 22, 1938, Woodward & Fondiller, Inc. again made a report, referred to as an "Actuarial Audit," upon the Ohio Fund, addressed in this case to the Industrial Commission of Ohio. Naturally I have felt it incumbent on me to study this report carefully and present my conclusions thereon to this Society, the more so when I discovered that in his transmittal letter to the Industrial Commission, Mr. Richard Fondiller said, *inter alia,* "The formulæ used by the Actuary of the Fund to establish the reserves for payment of claims were reviewed and found to be correct. Based upon our examination of the claims and analysis of the loss experience we find that the Actuary's

formulæ have been correctly applied and the reserves, in our opinion, are adequate. . . . *The solvency of the Fund is unquestionable: the margin of safety of the Statutory Surplus is 6.4%; that of the General Surplus is 2.1%; and thus the total margin of safety is 8.5%.* . . . The Fund has been successfully operated for over a quarter of a century and is the only state insurance fund where *all* injured employees covered by the Law receive the full benefits of the Workmen's Compensation Law, regardless of whether or not the employer is insured. Ohio was one of the few large States where, during the years of depression, all claimants and employers were fully protected through the ability of the Fund to meet all of its obligations."

The new report contains no direct refutation of this writer's demonstration that for the period 1929-33 the pure premium cost of the Ohio Fund was 38% higher than that for the corresponding period of New York, New Jersey and Massachusetts upon the Ohio benefit level, although Table 18 of the new report captioned, "Experience of All 40 Groups—Private Fund Based on 5-Year Experience Period 1933-37, Inclusive" invites such a comparison, being similar in arrangement to Table 13 of the old report,* upon which my previous study was based. A superficial comparison of the new Ohio experience by industry group with the old shows an amazing improvement. The pure premium for all groups combined has dropped from $1.20 to $.91. Furthermore, whereas the pure premiums for 39 of the 40 groups have dropped anywhere from a few cents to several dollars, only 3 groups show an increase in pure premium, and these increases are trifling in amount. This tremendous improvement is the more surprising when it is realized that each of the two five-year periods observed includes the calendar year 1933, i.e., the periods overlap to the extent of one year.

The tremendous reduction in pure premium indicated by Table 18 of the new report would, on the face of it, strongly suggest that all or the greater part of the previously demonstrated abnormal excess of the Ohio benefit cost over that of the three Eastern states has now been suddenly and miraculously wiped out.

* I shall herein refer to the "Actuarial Survey", dated November 26, 1934, as the "old report", and to the "Actuarial Audit", dated December 22, 1938, as the "new report"; and to figures appearing in the earlier report as "old", and those in the latter report as "new".

In order that we may determine whether, in fact, such an improvement has occurred, it is necessary to make a close comparison of new Table 18 with old Table 13. Accordingly, exact copies of these two tables are attached hereto as exhibits. (See Tables VI and VII.)

It will be noted that the captions of several columns in new Table 18 differ markedly from the corresponding column headings of the old Table 13. Confining our attention to the only item with differing caption which affects the determination of pure premiums, we find that new column 5 is captioned, "Claims Less Interest," whereas the old Column 5 was captioned merely, "Claims." On page 44 of the new report it is explained that "The figures for gross premium (Column 4) exclude the 2% of premiums which are credited to surplus for catastrophe losses, and also exclude Occupational Disease premiums, Self-insurers' premiums, and disbursements for State Auditors and Safety Division." Presumably, corresponding exclusions have been made as respects claims, so the implication is that "Claims Less Interest" as shown in new Table 18 exclude not only interest, but also catastrophe losses and occupational disease losses. It is clear that before Table 18 will be comparable with the experience of other states, adjustments must be made to restore these items; and when we look further through the new report it becomes apparent that still further adjustments are necessary.

A fairly concrete idea of the complexity of the problem confronting us will be formed when I point out that the new report contains no less than five different figures relating to claims incurred for the period 1933-37 for the "Private Fund," as follows:

Amount	Table No.	Page No.	Caption and Remarks
$52,014,000	18	43	"Claims Less Interest."
$52,124,000	8	23	"Development of Incurred Losses by Successive Valuations." This particular figure is the sum of the incurred losses as shown in Table 8 as of December 31, 1937 for "Years of Accident Occurrence" 1933-1937. All figures in this table are after deduction of the "Accumulated Interest Credited to the Reserves."

Amount	Table No.	Page No.	Caption and Remarks
$58,144,000	8	23	Previous figure plus increase in incurred as per Table 8 from December 31, 1932 to December 31, 1937 as respects "Years of Accident Occurrence" 1928-1932.
$73,817,882	9	26	"Loss From Claims Incurred" from "Gain and Loss Exhibit for the 5 years ended December 31, 1937—Private Fund."
$74,825,215	19	45	"Claims Incurred" from "Trends in Loss Ratio—Summary of Experience of All 40 Groups—Private Fund 1933-1937, Inclusive."

It must be admitted that the above figures represent a wide area of choice, ranging from the figure of $52,014,000 appearing in Table 18, to that of $74,825,215, which appears in the very next table, namely, Table 19. This multiplicity of varying figures apparently relating to the same item, is characteristic not only of the new report but of the old report as well. However, it is comforting to note that the figure of $73,817,882, which appears in Table 9 of the Gain and Loss Exhibit for the Private Fund actually is repeated elsewhere in the report, namely, in Table 22 on Page 48, captioned, "Private Fund—Comparative Statement of Gain and Loss for the Five Years ended December 31, 1937"; and I am going to lean very heavily on this last figure not merely because Mr. Fondiller gives it two votes instead of one, but also because I am sure it is reasonable to assume that the figure for "Loss from Claims Incurred" appearing in the Gain and Loss account, that most sacred of all accounting exhibits, represents the exact amount of claims which the Private Fund incurred during the calendar period 1933-37. (Incidentally, I am not going to succumb to the temptation to use the highest figure as to "claims incurred" appearing in the new report, namely, that in Table 19, even though it exceeds the amount shown in the Gain and Loss Exhibit by more than $1,000,000!)

The figure shown in the Gain and Loss Account exceeds that in the experience table by almost $22,000,000. On the face of it, it does not appear likely that interest, catastrophe losses and

occupational disease losses can possibly make up this difference, and upon investigation we will find that they do not.

The first impression created by this situation is that the incurred losses shown in the industry group experience (Table 18) are understated, i.e., they reflect inadequate reserves in respect of the accidents which have occurred in the period 1933-37. If an insurance institution is at all times setting up correct claim reserves then, according to its figures as of a given date, the incurred claims relating to the accidents of any recent five-year period will be approximately equal in amount to its losses incurred on the calendar year basis for the same five years. In fact, an excess of incurred losses on the calendar year basis over that on the "accident year" basis can be due only to the fact that at the beginning of the five-year period loss reserves were understated; and if such was the case a strong presumption is created that inadequate reserves have also been set up for the accidents occurring in the latest five years.

We can find plenty of sustantiation for this impression in the new report. Indeed, it is stated on Page 45, referring to "Trends in Loss Ratio" in 1933-37, "in each of these years, while the experience on current claims was favorable, it was necessary to strengthen the reserves on claims of *prior* years."

We find not only that this reserve deficiency is substantial, but that it has manifested itself in each of the latest five years, and in increasing degree. (See Table I attached hereto.) The new report includes an exhibit showing the development of incurred losses *by year of accident* as valued on successive year-end dates, as well as figures (Table 22, Page 48) for incurred claims for each calendar year, which latter figures balance out with the Gain and Loss Exhibit for the five-year period. Making appropriate adjustment in the accident year figures to eliminate the deduction of interest and to include claims due to catastrophe, occupational disease, self-insurers, uninsured employers, and safety violations, we find that as respects each of the latest five accident years, the first estimate of claims incurred fell far short of the calendar year "claims incurred" figure. This deficiency, which, as the new report shows, arose because "it was necessary to strengthen the reserves on claims of *prior* years," ranges in amount from $1,537,063 in 1933 to $5,519,784 in 1937.

There is every indication, then, that the reserve situation is getting worse rather than better.

In a situation such as this, it would not be unreasonable to assume that the claim cost relating to accidents occurring in the period 1933-37 will eventually prove to be at least as great as the total of claims incurred appearing in the Gain and Loss Exhibit. However, there is evidence supporting another approach to our problem; and, in all fairness, let us see what that evidence indicates before attempting definite conclusions. (This evidence is presented in Tables II, III and IV attached hereto.)

Table 8, Page 23, of the new report shows that as of December 31, 1937, the incurred losses relating to accident years 1933-37 amounted to $52,124,000. However, upon analysis of the changes in reserves shown in this table to have occurred from December 31, 1932 to the close of 1937 on accident years 1928 and subsequent (see Table III), we find that if we take the happenings of this five-year period as a guide to future reserve developments, the reserves on the last five accident years are still deficient to the extent of $7,685,000; which brings our incurred loss figure for accident years 1933-37 to $59,809,000. (We have still taken no account of reserve developments beyond the "tenth valuation," i.e., beyond a date nine years after December 31st of the year of accident occurrence, because data for that purpose are unavailable).

The new report casts no light whatever on the difference between incurred claims less accumulated interest and such incurred claims before interest deduction. However, as explained in line 4 of Table II, such evidence is contained in the old report in respect of accident years 1929-33, and, making due allowance for this difference, the incurred loss for the latest five accident years becomes $65,072,192.

We are still shy of any allowance for catastrophe and occupational disease claims, and once more the new report reveals no evidence on this point. However, using figures from the old report, as explained in Line 6 of Table II, we are able to make an adjustment for these items which brings the claims incurred for accident years 1933-37 to $67,084,734.

Now we are not through with this matter of reserve deficiency, for, as just stated, we have made no allowance for unfavorable

developments after the tenth valuation. Line 6 of Table IV, which table accounts for the difference between the calendar year figures and the accident year figures as closely as we can with the evidence at hand, indicates that in the period 1933-37 there was sustained an incurred loss, gross as to interest, due to reserve deficiency on accident years prior to 1928 of $6,450,176. This figure cannot all be attributed to deficiencies occurring after the tenth valuation date, since accident years 1924 to 1927 had not, at the beginning of 1933, reached the tenth valuation. However, the size of this figure strongly supports the probability that a substantial part of it was due to reserve deficiencies emerging after the tenth valuation.

We have, therefore, two figures to consider as a measure of the claim cost due to the accidents of 1933-37.

1. That of $67,084,734 built up from the accident year figures appearing in the new report, upon evidence contained in the old and the new reports as to (a) adjustment for the deduction of interest and (b) reserve deficiency through the tenth valuation. This figure, which as we have just observed, is *probably too low,* indicates that the pure premiums in Table 18 of the new report should be increased 29.0%.
2. That of $73,079,703, which is the calendar year figure from the Gain and Loss Exhibit, reduced, as shown in Lines (11) and (12) of Table II, to eliminate certain claims not chargeable to the experience of the insured employers. This figure, which represents the amount of claim cost which the private assured of the Fund *had to pay for* in 1933-37, indicates that the pure premiums in Table 18 should be increased 40.5%.

Evidently we cannot be wide of the mark if we adjust the pure premiums and the figures for "Claims Less Interest" in the Ohio industry group experience by the mean of these factors, i.e., if we increase them 34.7%. This procedure will enable us to make an appropriate comparison between the Ohio experience and that of other states.

In Table V (attached hereto) is shown a comparison of the combined experience of New York, New Jersey and Massachusetts, all on the Ohio benefit level, with the Ohio experience, with the necessary adjustment made in the latter, namely, with "Claims Less Interest" and pure premiums increased the said 34.7%. This adjustment, by the way, puts the total Ohio experience for 1933-37

upon a cost level slightly higher than that of 1929-33, as shown in the old report. (The Ohio pure premium for all industry groups combined on the adjusted basis for 1933-37 is $1.23, as compared with $1.20 for 1929-33.) Furthermore, when, for industry groups which can be identified as comparable with industry schedules in use in the other states, the pure premiums of the three Eastern States combined (on the Ohio benefit level) are applied to the Ohio payrolls, we again find, as I did in my previous study, that the Ohio losses are 38% higher than the level indicated by the Eastern experience!

This latest Ohio experience, therefore, still indicates an abnormally high benefit cost, occasioning undue monetary loss to employers and undue loss of life, health, income and happiness upon the part of workmen and their families!

The tremendous reserve inadequacies revealed in the new report reflect gravely indeed upon the present financial position of the Ohio Fund.

At December 31, 1937, the surplus of the Private Fund, according to the new report, was $4,340,435. (Of this amount $4,300,255, all but $40,180, has been derived from contributions by self-insurers!) Study of the changes which have occurred in reserves since December 31, 1932 indicates that the reserves at the end of 1937 for accident years 1928-37 were deficient to the extent of $10,765,000. (See Table III.) Our evidence here, as already stated, gives no indication of what may happen after the first ten years of development. (The figure just named is net of interest credited to reserves, as is entirely proper from the standpoint of financial condition, though not from that of a comparison of pure premium cost.) As Table I clearly indicates, there is no evidence that the Ohio Fund is catching up with this reserve situation. It seems, therefore, a reasonable assumption that on December 31, 1937 there existed in the total claim reserve of the Private Fund a deficiency not less than the sum last named, which would imply that the assets of the Fund as carried in its balance sheet at the end of 1937 were insufficient to cover its reserves, had the latter been set up on an adequate basis, to the extent of $6,424,565. In other words, if the Private Fund were to liquidate, somebody, the employers or the taxpayers, presumably, would have to make a contribution of more than $6,000,000! Perhaps it is superfluous

to state that this indicated deficit would be, save for the contribution of self-insurers, $10,724,820!

I now ask, as I did three years ago,—what justification can there be for any state's initiating or continuing an experiment of this kind in the workmen's compensation field, the automobile liability field, or any other field which can be served by private insurance?

I, for one, do not know the answer, and yet during the legislative sessions in 1939 there were introduced in the Legislatures of twelve states monopolistic state fund bills for workmen's compensation; and during the same legislative period, bills for monopolistic state funds covering compulsory automobile liability insurance were also introduced in twelve states! And, under date of June 30, 1939, Mr. Verne A. Zimmer, Director, Division of Labor Standards, transmitted to Hon. Frances Perkins, Secretary of Labor, a report entitled, "Progress of State Insurance Funds Under Workmen's Compensation—A Quarter Century of American Experience," by John B. Andrews. This pamphlet is the frankest sort of propaganda for state monopoly of compensation insurance. In Chapter VIII of this brochure, entitled, "The Case for State Funds," a "condensation of the principal reasons commonly advanced for the adoption of State compensation funds" is "briefly presented," covering the following captions:

"Public Responsibility"
"Complete Security"
"Social Service"
"Administrative Economy"
"Lower Cost to Employers"

Under the last heading appears the following:

"(1) The economy of workmen's compensation through State Funds, by elimination of unnecessary expense, is indicated by comparison of the average expense ratios (the proportion of collected premiums taken for expenses and profits):

1. For stock companies (selected risks) it is now about 40%.
2. For mutual companies (selected risks) it is now from 20 to 25%.
3. From competitive State Funds (all risks) it is from 10 to 20%.
4. For exclusive State Funds (all risks) it is from 5 to 10%.

"In simple terms, therefore, the cost to employers under exclusive State Funds is more than 30% less than under stock companies."

This last statement, as we have seen, simply is not true as far as the largest State Fund in the country is concerned.

I am loathe to believe that the responsible representatives of labor, or of the Federal Government, are so blindly committed to state monopoly as to ignore the facts concerning it, once they are acquainted with them. On the other hand, it is, as I see it, distinctly the job of the casualty business, if it is at all interested in its own survival, to collate these facts conscientiously, and display them widely, and persistently. In this task, which is quite as urgently important to the public as it is to our business, this paper, in the nature of things, can be "only the beginning."

TABLE I

INCURRED LOSSES DIVIDED BETWEEN AMOUNT RELATING TO ACCIDENTS OF CURRENT YEAR AND DEFICIENCY IN RESERVES FOR ACCIDENTS OF PRIOR YEARS

Year or Period	"Year of Accident" Incurred Losses, 1st Valuation, Net of Interest	Same Adjusted to Include Interest, and Claims Due to Catastrophe, Occupational Disease, Self-Insurers, Uninsured Employers and Safety Violations (1)×1.077(b)	"Claims Incurred" — Private Fund as per Gain and Loss Exhibit	Difference (3) — (2)	% Ratio (4)/(2)
	(1)	(2)	(3)	(4)	(5)
1933	$ 6,982,000(a)	$ 7,520,000	$ 9,057,063(c)	$1,537,063	20.4
1934	8,234,000(a)	8,868,000	13,947,276(c)	5,079,276	57.3
1935	8,537,000(a)	9,194,000	12,588,890(c)	3,394,890	36.9
1936	12,140,000(a)	13,075,000	16,873,869(c)	3,798,869	29.0
1937	14,699,000(a)	15,831,000	21,350,784(c)	5,519,784	34.9
1933-37	50,592,000	54,488,000	73,817,882	19,329,882	35.5

(a) From Column 1, Table 8, Page 23, New Report.

(b) This factor is product of interest factor (1.034), factor for inclusion of catastrophe and occupational disease claims (1/.97) and factor for inclusion of claims due to Self-Insurers, Uninsured Employers, and Safety Violation (1/.99). The two latter factors are explained in Table II of this paper. The interest factor (1.034) is the ratio of Incurred Claims before interest deduction, Accident Years 1929-33, from Table 17, p. 48, Old Report ($66,059,565) to Incurred Claims after interest deduction from same Table ($63,902,653).

(c) From Table 22, p. 48, New Report, "Private Fund — Comparative Statement of Gain and Loss for the Five Years Ended December 31, 1937."

TABLE II

DERIVATION OF FACTOR TO ADJUST LOSSES AND PURE PREMIUMS FOR ACCIDENT YEARS 1933-37, SHOWN IN TABLE 18, P. 43, NEW REPORT, TO BASIS COMPARABLE WITH EXPERIENCE ON NEW YORK, NEW JERSEY AND MASSACHUSETTS

Item	Source or Explanation	Amount
(1) Incurred Losses	Table 8, p. 23, New Report. This figure is after "The accumulated interest credited to reserves" has been deducted.	$52,124,000
(2) Indicated Reserve Deficiency through tenth valuation	Indicated by changes in incurred loss between 12/31/32 and 12/31/37 on accident years 1928 and subsequent (See Table III, this paper).	$ 7,685,000
(3) Sum	Line (1) plus Line (2)	$59,809,000
(4) Factor to eliminate Interest Deduction	Ratio of Incurred Claims before interest deduction for Accident Years 1929-33 as at 12/31/33 (Table 17, p. 48, Old Report) ($69,393,272); to same after interest deduction (from same source) ($63,769,941) (The New Report contains no similar table.)	1.088
(5) Product	Line (3) × Line (4)	$65,072,192
(6) Factor to include catastrophe and occupational disease claims	No figures on this in New Report; but Old Report (for 1929-33) shows the following: Table 14, p. 40 Total Claims (ex-catastrophe) ..... $69,168,520 Table 19, p. 52 Incurred Claims, catastrophes 1929-33..... 1,268,009 TOTAL ..... $70,436,529 Ratio of "Catastrophe" to "Total," 1.8%. Table 10, p. 34 Private Employees Disease Division—Claim Vouchers 1929-33 ..... $ 824,936 Table 6, p. 29 Employees Accident Division—Claim Vouchers 1929-33 72,199,699 TOTAL ..... $73,024,635 Ratio of "Disease" to "Total" 1.1%. From the above we conclude that catastrophes and disease combined constitute about 3% of Total Claims.	1/.97
(7) Product	Line (5) × Line (6)	$67,084,734
(8) Claims Less Interest	Table 18, p. 43, New Report. (This is the figure upon which the pure premiums shown in said Table are based.)	$52,014,000

TABLE II (*Continued*)

Item	Source or Explanation	Amount
(9) Factor (I)	To adjust "Claims Less Interest" and pure premiums shown in Table 18, p. 43, New Report to basis comparable with experience of other states. Line (7) divided by Line (8).	1.290
(10) Claims Incurred	From Table 9, p. 26, New Report (Gain & Loss Exhibit).	$73,817,882
(11) Factor to Eliminate Claims Due to Self-Insurers, Uninsured Employers and Safety Violation	Tables 6, 7, 8, 9, 10, p. 29, 30, 31, 33, 34 Old Report show the following for years 1929-33: *Claim Vouchers* Self-Insurers Accident ..... $ 47,184 Non-Compliance ..... 552,255 Safety Violations ..... 158,663 Self-Insurers Disease ..... —o— TOTAL ..... $758,102 (a) Total—Tables 6, 7, 8, 9, 10 ..... $73,782,737 (b) Ratio (a) to (b) — 1.03%. From the above we conclude that Claims Due to Self-Insurers, Uninsured Employers, and Safety Violation constitute about 1% of Total Claims.	.99
(12) Product	Line (12) × Line (13)	$73,079,703
(13) Factor (II)	For purpose stated in Line (9), but based on assumption that Incurred Claims for Accident Years 1933-37 would, if adequately reserved for at least equal in amount of the Incurred Claims for Calendar Years 1933-37. Line (12) divided by Line (8).	1.405
(14) Factor (III)	Mean of lines (9) and (13) (This is the factor used in Table V, as explained in the text of this paper.)	1.347

RESERVE DEFICIENCY INDICATED BY DEVELOPMENT OF INCURRED LOSSES DURING FIVE YEARS ENDED DECEMBER 31, 1937 (BASED ON TABLE 8, P. 23, NEW REPORT)

Yr. of Accident Occurrence	Incurred Losses (in Thousands) for Each Accident Year as of Successive Valuation Dates (a)									
	1st Val.	2nd Val.	3rd Val.	4th Val.	5th Val.	6th Val.	7th Val.	8th Val.	9th Val.	10th Val.
1928					$14,603	$15,046	$15,293	$15,232	$15,653	$15,917
									Total $15,653	$15,917
									Ratio—1.017	
1929				$17,769	18,082	18,680	18,418	18,834	19,590	
								Total $34,066	$35,243	
								Ratio—1.035		
1930			$15,874	16,296	16,989	16,359	16,747	17,339		
							Total $50,458	$51,405		
							Ratio—1.019			
1931		$13,045	13,288	13,756	13,253	13,450	13,832			
						Total $63,535	$64,290			
						Ratio—1.012				
1932	$8,884	9,119	9,296	9,096	9,464	9,517				
					Total $72,391	$73,052				
					Ratio—1.009					
1933	6,982	6,920	6,830	7,202	7,401					
			5 yr.	Total $64,119	$65,189					
				Ratio—1.017						
1934	8,234	7,915	8,553	8,910						
		5 yr.	Total $53,841	$55,260						
			Ratio—1.026							
1935	8,537	8,961	9,516							
	5 yr.	Total $45,960	$47,483							
		Ratio—1.033								
1936	12,140	11,598								
	5 yr. Total $44,777	$44,513								
	Ratio — .944									
1937	$14,699									

Year of Accident Occurrence	(1) Incurred Loss (in Light of Valuation to 12/31/37)	(2) Deficiency Factor	(3) Deficiency as of Dec. 31, 1937 (1) × (2)
1928	$ 15,917,000	.000	$ —o—
1929	19,590,000	1.017 — 1.000 = .017	333,000
1930	17,339,000	(1.017 × 1.035) — 1.000 = .053	919,000
1931	13,832,000	(1.053 × 1.019) — 1.000 = .073	1,010,000
1932	9,517,000	(1.073 × 1.012) — 1.000 = .086	818,000
1933	7,401,000	(1.086 × 1.009) — 1.000 = .094	696,000
1934	8,910,000	(1.094 × 1.017) — 1.000 = .113	1,007,000
1935	9,516,000	(1.113 × 1.026) — 1.000 = .142	1,351,000
1936	11,598,000	(1.142 × 1.033) — 1.000 = .180	2,088,000
1937	14,699,000	(1.180 × .994) — 1.000 = .173	2,543,000
Total Latest 5 Yrs.	$ 52,124,000		7,685,000
Total 10 Yrs.....	$128,319,000		$10,765,000

NOTE: (a) "First Valuation" is at end of Calendar Year in which accident occurred; successive valuations annually thereafter.

TABLE IV

Analysis of Incurred Losses for Calendar Period 1933-37 by Year of Accident Occurrence "Private Fund" Only

	Years of Accident Occurrence	(1) Incurred Loss After Deduction of Interest	Adjustment for Inclusion of Catastrophe and Occupational Disease Claims		(4) Earned Interest	(5) Adjusted Incurred Loss Without Interest Deduction (3) + (4)
			(2) Factor	(3) Adjusted Incurred Loss, Net of Interest (1) × (2)		
(1) Columns (4) & (5) from Table 9, p. 26 — "Gain and Loss Exhibits," etc.— "Private Fund"	all	($65,499,751)	XX	XX	($8,318,131)	($73,817,882)
(2) Line (1) less 1% to exclude claims due to Self-Insurers, Uninsured Employers, and Safety Violation	all	$64,844,753	1.00	$64,844,753	$8,234,950	$73,079,703
(3) Column (1) from Table 8 p. 23, "Development of Incurred Losses by Successive Valuations"	1928-32	$ 6,020,000	1/.97	$ 6,206,000	(b) $1,958,759	$ 8,164,759
(4)	1933-37	$52,124,000	1/.97	$53,736,000	(a) $4,728,768	$58,464,768
(5)	1928-37	$58,144,000	1/.97	$59,942,000	$6,687,527	$66,629,527
(6) Column (3) obtained by subtracting line (5) from line (2)	all prior to 1928	XX	XX	$4,902,753	(b) $1,547,423	$ 6,450,176

NOTE: (a) Column (3) × .088. Table 17, p. 48, Old Report, indicates that at the end of 1933, this was the ratio of "accumulated interest" to "net claims" for years of accident 1929-33.

(b) Difference between lines (2) and (4) divided in proportion to lines (3) and (6) of column (3).

TABLE V

Pure Premium Cost by Industry Group for Workmen's Compensation Insurance
Ohio compared with New York, New Jersey and Massachusetts Combined

Ohio Experience—Accident Years 1933-37 inclusive							New York, New Jersey and Massachusetts Exp. Combined—Ohio level—P. Y. 1933-36 inclusive					Difference in Pure Premiums		
			Basis I (a)		Basis II (b)									
Group Nos.	Description	Payrolls (Hundreds of $)	Incurred Losses	Pure Premiums (2)÷(1)	Incurred Losses (2)×1.347	Pure Premiums (4)÷(1)	Sched. Nos.	Description	Payrolls (Hundreds of $)	Incurred Losses Ohio Law Level	Pure Premiums (7)÷(6)	Basis I (3)−(8)	Basis II (5)−(8)	Projected Losses on Ohio Payrolls (1)×(8)
		(1)	(2)	(3)	(4)	(5)			(6)	(7)	(8)	(9)	(10)	(11)
1A	Food & Beverages	$109,296,0	$1,178,000	$	$1,586,766	$	05	Food and Tobacco	$734,507,1	$9,183,675	$	$	$	$
1B	" " "	79,970,0	1,323,000		1,782,081									
	Total	189,266,0	2,501,000	1.32	3,368,847	1.78		Total	734,507,1	9,183,675	1.25	.07	.53	2,365,825
2A	Chemicals & Drugs	47,094,0	409,000		550,923		24	Chemicals	267,710,2	3,017,485				
2B	" " "	19,034,0	218,000		293,646									
9	Oils and Grease	88,137,0	1,020,000		1,373,940									
	Total	154,265,0	1,647,000	1.07	2,218,509	1.44		Total	267,710,2	3,017,485	1.13	−.06	.31	1,743,195
4	Mines and Quarries	130,714,0	5,705,000		7,684,635		02	Mining	9,623,8	334,881				
							04	Quarrying & Stone Crushing	19,597,3	767,791				
	Total	130,714,0	5,705,000	4.36	7,684,635	5.80		Total	29,221,1	1,102,672	3.77	.59	2.03	4,927,918
5A	Construction	74,861,0	1,701,000		2,291,247		26	Contracting—Not Erection	211,212,6	7,902,189				
5B	"	65,339,0	2,394,000		3,224,718		27	Erection	651,843,9	21,568,209				
5C	"	61,044,0	2,800,000		3,771,600									
5D	"	10,063,0	996,000		1,341,612									
	Total	211,307,0	7,891,000	3.73	10,629,177	5.03		Total	863,056,5	29,470,398	3.41	.32	1.62	7,205,569
7A	Leather & Rubber	130,153,0	827,000		1,113,969		09	Leather	500,159,6	2,843,579				
7B	" " "	5,612,0	74,000		99,678		10	Rubber Composition, Bone Goods, etc.	183,881,3	1,661,835				
	Total	135,765,0	901,000	.66	1,213,647	.89		Total	684,040,9	4,505,414	.66	—0—	.23	896,049
12A	Stone	7,828,0	130,000		175,110		21	Stone Products	55,513,7	985,011				
12B	"	13,029,0	184,000		247,848									
	Total	20,857,0	314,000	1.51	422,958	2.03		Total	55,513,7	985,011	1.76	−.25	.27	367,083

TABLE V—*Continued*

PURE PREMIUM COST BY INDUSTRY GROUP FOR WORKMEN'S COMPENSATION INSURANCE OHIO COMPARED WITH NEW YORK, NEW JERSEY AND MASSACHUSETTS COMBINED

Ohio Experience—Accident Years 1933-37 inclusive							New York, New Jersey and Massachusetts Exp. Combined—Ohio level—P. Y. 1933-36 inclusive					Difference in Pure Premiums		
			Basis I (a)		Basis II (b)									
Group Nos.	Description	Payrolls (Hundreds of $)	Incurred Losses	Pure Premiums (2)÷(1)	Incurred Losses (2)×1.347	Pure Premiums (4)÷(1)	Sched. Nos.	Description	Payrolls (Hundreds of $)	Incurred Losses Ohio Law Level	Pure Premiums (7)÷(6)	Basis I (3)−(8)	Basis II (5)−(8)	Projected Losses on Ohio Payrolls (1)×(8)
		(1)	(2)	(3)	(4)	(5)			(6)	(7)	(8)	(9)	(10)	(11)
14A	Textiles	$172,324,0	$437,000	$	$588,639	$	06	Textiles	$943,137,2	$5,537,139	$	$	$	$
14B	"	94,938,0	740,000		996,780		07	Clothing and Other Cloth Goods	1,436,642,5	4,781,448				
	Total	267,262,0	1,177,000	.44	1,585,419	.59		Total	2,379,779,7	10,318,587	.43	.01	.16	1,149,227
15	Ore Reduction & Concentration	11,693,0	153,000	1.31	206,091	1.76	16	Metallurgy Total	40,901,9	583,989	1.43	−.12	.33	167,210
16A	Paper	297,436,0	1,020,000		1,373,940		12	Paper & Pulp, Paper Goods and Printing	895,610,5	5,971,611				
16B	"	50,861,0	620,000		835,140									
	Total	348,297,0	1,640,000	.47	2,209,080	.63		Total	895,610,5	5,971,611	.67	−.20	−.04	2,333,590
17A	Pottery & Glass	94,458,0	618,000		832,446		22	Clay Products	38,181,1	397,422				
17B	" " "	69,918,0	686,000		924,042		23	Glass & Glass Products	64,124,7	414,360				
	Total	164,376,0	1,304,000	.79	1,756,488	1.07		Total	102,305,8	811,782	.79	—0—	.28	1,298,570
18A	Stores (c)	1,970,960,0	4,322,000		5,821,734		34	Commercial Enterprises	2,489,114,0	23,282,016				
18B	"	116,947,0	2,006,000		2,702,082		35	Clerical & Professional	7,708,473,3	8,195,447				
	Total	2,087,907,0	6,328,000	.30	8,523,816	.41		Total	10,197,601,3	31,477,463	.31	−.01	.10	6,472,512
	Sub Total	$3,721,709,0	$29,561,000	.79	$39,818,667	1.07		Sub Total	$16,250,248,7	$97,428,087	.60	.19	.47	$28,926,748
	All Other Groups	1,977,539,0	22,453,000		30,244,191			All Other Groups	5,205,658,3	58,954,808				
	Grand Total	$5,699,248,0	$52,014,000	.91	$70,062,858	1.23		Grand Total (d)	$21,455,907,5	$155,382,895	.72	.19	.51	

(a) Incurred Loss and Pure Premium as shown in Table 18, P.43 New Report.
(b) Incurred Loss and Pure Premium adjusted by factor 1.347 (see line (14), Table II).
(c) Includes clerical classifications.
(d) Excluding Per Capita, Flying Hours and Cabs.

N.B. For the three eastern states the experience of the *policy* years 1933-36 was employed for comparison with the Ohio experience for *accident* years 1933-37. This is an appropriate comparison, since the central point in time of these respective periods is identical viz., June 30, 1935.

TABLE VI

FROM REPORT ON OHIO STATE INSURANCE FUND TO GOVERNOR'S INVESTIGATING COMMITTEE, DATED NOV. 26, 1934

TABLE 13

EXPERIENCE OF ALL 40 GROUPS — PRIVATE ACCIDENT

Based on 5 Year Experience Period 1929-1933 Inclusive

Group No. (1)	Description (2)	Payroll (00's omitted) (3)	Gross Premium (98% + Interest) (4)	Claims (5)
1 A	Foods and Beverages	$ 106,750,0	$ 1,011,395	$ 1,206,639
1 B	Foods and Beverages	54,750,0	792,192	1,105,014
2 A	Chemicals and Drugs	50,650,0	526,328	508,727
2 B	Chemicals and Drugs	12,620,0	249,854	250,483
3	Wood and Metal....	69,800,0	643,577	1,102,088
4	Mines and Quarries.	98,870,0	5,493,268	7,183,864
5 A	Construction	117,910,0	1,551,304	2,867,057
5 B	Construction	139,270,0	4,055,438	6,409,466
5 C	Construction	52,960,0	2,092,432	3,347,752
5 D	Construction	19,190,0	1,602,980	2,848,221
6 A	Utilities, Railroads and Electrical....	32,870,0	466,503	589,657
6 B	Utilities, Railroads and Electrical....	28,780,0	1,050,433	1,191,849
7 A	Leather and Rubber	126,200,0	775,078	1,065,651
7 B	Leather and Rubber	6,000,0	56,849	85,294
8 A	Wood	26,730,0	194,909	285,874
8 B	Wood	80,470,0	1,069,049	1,571,177
8 C	Wood	8,750,0	437,563	546,441
9	Oils and Grease....	83,610,0	1,157,322	1,371,071
10 A	Metal	117,010,0	833,538	1,080,971
10 B	Metal	484,040,0	4,788,933	5,900,842
10 C	Metal	201,140,0	2,513,656	3,363,526
10 D	Metal	55,440,0	1,214,346	1,328,959
11	Transportation and Public Utilities ..	184,150,0	2,410,750	3,467,047
12 A	Stone	10,760,0	128,311	177,690
12 B	Stone	11,150,0	197,803	232,056
13 A	Miscellaneous	57,560,0	273,529	320,406
13 B	Miscellaneous	107,470,0	1,702,479	2,098,161
13 C	Miscellaneous	6,840,0	407,588	551,986
13 D	Miscellaneous	5.180,0	419,168	796,078
14 A	Textile	161,340,0	321,115	489,574
14 B	Textile	103,520,0	674,095	950,032
15	Ore Reduction and Concentration ...	15,880,0	237,096	222,580
16 A	Paper	345,770,0	1,003,029	1,127,351
16 B	Paper	49,500,0	650,453	696,827
17 A	Pottery and Glass..	87,930,0	822,494	821,983
17 B	Pottery and Glass..	71,420,0	966,281	1,070,851
18 A	Stores	2,045,780,0	3,724,219	5,559,342
18 B	Stores	116,670,0	1,826,307	2,354,394
19 A	Service	226,960,0	1,142,620	1,384,284
19 B	Service	188,400,0	1,465,485	1,637,273
	TOTALS.....	$5,770,090,0	$50,949,669	$69,168,538

TABLE VI (*Continued*)

FROM REPORT ON OHIO STATE INSURANCE FUND TO GOVERNOR'S INVESTIGATING COMMITTEE, DATED NOV. 26, 1934

TABLE 13 (*Continued*)

EXPERIENCE OF ALL 40 GROUPS — PRIVATE ACCIDENT
Based on 5 Year Experience Period 1929-1933 Inclusive

(4) — (5) Gain (6)	(5) — (4) Deficit (7)	Average Premium Rate as per Actuary Excluding Interest (100% Prem. ÷ (3)) (8)	(4) ÷ (3) Average Collected Premium Rate (Incl. Interest) (9)	(5) ÷ (3) Average Loss Cost (10)
	$ 195,245	$ .82	$ .95	$1.13
	312,822	1.25	1.45	2.02
$17,599		.90	1.04	1.00
	630	1.71	1.98	1.98
	458,510	.80	.92	1.58
	1,690,597	4.80	5.56	7.27
	1,315,754	1.14	1.32	2.43
	2,354,027	2.52	2.91	4.60
	1,255,319	3.41	3.95	6.32
	1,245,241	7.22	8.35	14.84
	123,154	1.23	1.42	1.79
	141,415	3.15	3.65	4.14
	290,575	.53	.61	.84
	28,446	.82	.95	1.42
	90,966	.63	.73	1.07
	502,128	1.15	1.33	1.95
	108,879	4.32	5.00	6.24
	213,748	1.20	1.38	1.64
	247,385	.62	.71	.92
	1,111,907	.86	.99	1.22
	849,867	1.08	1.25	1.67
	114,612	1.89	2.19	2.40
	1,056,297	1.13	1.31	1.88
	49,379	1.03	1.19	1.65
	34,252	1.53	1.72	2.08
	46,876	.41	.48	.56
	395,684	1.37	1.58	1.95
	144,398	5.15	5.96	8.06
	376,909	7.00	8.09	15.38
	168,458	.17	.20	.30
	275,937	.56	.65	.92
14,517		1.29	1.49	1.40
	124,322	.25	.29	.33
	46,374	1.14	1.31	1.41
512		.81	.94	.93
	104,569	1.17	1.35	1.50
	1,835,123	.16	.18	.27
	528,087	1.35	1.57	2.02
	241,665	.43	.50	.61
	171,790	.67	.78	.87
(Net)	$18,218,719	$ .76	$ .88	$1.20

TABLE 18

EXPERIENCE OF ALL 40 GROUPS — PRIVATE FUND BASED ON 5-YEAR EXPERIENCE PERIOD 1933-1937 INCLUSIVE

In Thousands (000. omitted)

Group No. (1)	Description (2)	Payroll (3)	Gross Premium (4)	Claims Less Interest (5)	+ Gain − Deficit (6)	Experience Prior to Jan. 1, 1933 + Gain − Deficit (7)	As of Dec. 31, 1937 + Gain − Deficit (8)	Average Premium Rate Excluding Catastrophe (4) ÷ (3) (9)	Average Loss Cost Excluding Catastrophe (5) ÷ (3) (10)
1A	Foods and Beverages	$ 109,296,	$ 1,179,	$ 1,178,	$+ 1,	$+ 26,	$+ 27,	$1.08	$1.08
1B	Foods and Beverages	79,970,	1,334,	1,323,	+ 11,	− 71,	− 60,	1.67	1.65
2A	Chemicals and Drugs	47,094,	419,	409,	+ 10,	+ 128,	+ 138,	.89	.87
2B	Chemicals and Drugs	19,034,	280,	218,	+ 62,	+ 133,	+ 195,	1.47	1.15
3	Wood and Metal	69,190,	848,	711,	+ 137,	+ 111,	+ 248,	1.23	1.03
4	Mines and Quarries	130,714,	8,271,	5,705,	+ 2,566,	− 4,267,	−1,701,	6.32	4.36
5A	Construction	74,861,	2,294,	1,701,	+ 593,	− 836,	− 243,	3.06	2.27
5B	Construction	65,339,	3,728,	2,394,	+ 1,334,	− 2,235,	− 901,	5.71	3.66
5C	Construction	61,044,	4,160,	2,800,	+ 1,360,	− 1,597,	− 237,	6.82	4.59
5D	Construction	10,063,	1,625,	996,	+ 629,	− 1,759,	−1,130,	16.15	9.91
6A	Utilities—Railroads and Electrical	23,469,	518,	436,	+ 82,	− 268,	− 186,	2.21	1.86
6B	Utilities—Railroads and Electrical	26,492,	778,	521,	+ 257,	− 92,	+ 165,	2.94	1.97
7A	Leather and Rubber	130,153,	857,	827,	+ 30,	+ 237,	+ 267,	.66	.64
7B	Leather and Rubber	5,612,	51,	74,	− 23,	+ 98,	+ 75,	.91	1.32
8A	Wood	25,722,	202,	183,	+ 19,	+ 30,	+ 49,	.78	.71
8B	Wood	67,785,	1,288,	1,025,	+ 263,	− 104,	+ 159,	1.90	1.51
8C	Wood	6,144,	391,	334,	+ 57,	− 298,	− 241,	6.36	5.45
9	Oils and Grease	88,187,	1,405,	1,020,	+ 385,	− 475,	− 90,	1.59	1.15
10A	Metal	144,393,	1,196,	1,006,	+ 190,	+ 39,	+ 229,	.83	.70
10B	Metal	585,348,	6,151	5,666,	+ 485,	+ 450,	+ 935,	1.05	.97
10C	Metal	209,533,	2,965,	2,831,	+ 134,	+ 1,251,	+1,385,	1.42	1.35
10D	Metal	56,295,	1,158,	1,141,	+ 17,	+ 416,	+ 433,	2.06	2.03
11	Transportation and Public Utilities	185,498,	4,430,	2,909,	+ 1,521,	− 883,	+ 638,	2.39	1.57
12A	Stone	7,828,	125,	130,	− 5,	− 26,	− 31,	1.60	1.66
12B	Stone	13,029,	196,	184,	+ 12,	− 16,	− 4,	1.50	1.41
13A	Miscellaneous	43,373,	281,	225,	+ 56,	− 101,	− 45,	.65	.52
13B	Miscellaneous	102,608,	2,148,	1,828,	+ 320,	− 528,	− 208,	2.09	1.78
13C	Miscellaneous	8,124,	649,	433,	+ 216,	+ 9,	+ 225,	7.99	5.33
13D	Miscellaneous	5,187	566,	439,	+ 127,	− 480,	− 353,	10.91	8.46
14A	Textile	172,324	458,	437,	+ 21,	− 53,	− 32,	.27	.25
14B	Textile	94,938,	725,	740,	− 15,	+ 8,	− 7,	.76	.78
15	Ore Reduction and Concentration	11,693,	133,	153,	− 20,	+ 332,	+ 312,	1.14	1.31
16A	Paper	297,436,	1,158,	1,020,	+ 138,	− 56,	+ 82,	.39	.34
16B	Paper	50,861,	559,	620,	− 61,	+ 255,	+ 194,	1.10	1.22
17A	Pottery and Glass	94,458,	950,	618,	+ 332,	− 270,	+ 62,	1.01	.65
17B	Pottery and Glass	69,918,	863,	686,	+ 177,	+ 133,	+ 310,	1.23	.98
18A	Stores	1,970,960,	5,470,	4,322,	+ 1,148,	− 1,154,	− 6,	.27	.22
18B	Stores	116,947,	2,596,	2,006,	+ 590,	− 594,	− 4,	2.22	1.72
19A	Service	225,225,	1,526,	1,279,	+ 247,	− 235,	+ 12,	.68	.57
19B	Service	193,153,	1,596,	1,486,	+ 110,	− 100,	+ 10,	.83	.77
	Totals	$5,699,248,	$65,527,	$52,014,	$+13,513,	$−12,842,	$+ 671,	$1.15	$0.91

TABLE VIII

*Experience of New York, New Jersey and Massachusetts, Policy Years 1933-36
(As Furnished by the Official Rating Bureaus of These States)

Industry Schedule Description	No.	New York Payroll (to nearest $100)	New York Incurred Losses	New Jersey Payroll (to nearest $100)	New Jersey Incurred Losses	Massachusetts Payroll (to nearest $100)	Massachusetts Incurred Losses
Agriculture	01	$ 75,739,4	$ 1,362,799	$ 43,910,9	$ 670,358	$ 31,006,4	$ 394,512
Mining	02	9,445,3	384,186	178,5	15,847	..	..
Quarrying, Stone Crushing, etc.	04	9,747,9	539,439	5,443,6	156,445	4,405,8	144,686
Food and Tobacco	05	427,060,8	7,269,875	165,386,9	1,627,574	142,059,4	1,344,490
Textiles	06	259,489,0	1,601,066	233,090,5	1,374,196	450,557,7	2,518,139
Cloth Products	07	1,172,609,4	4,627,359	170,667,7	587,700	93,365,5	309,967
Laundries	08	144,063,6	1,547,790	43,821,2	274,852	36,666,8	247,900
Leather	09	200,711,5	1,245,683	48,290,5	311,188	251,157,6	1,335,145
Rubber, Composition, Bone Goods, etc.	10	47,823,5	563,625	55,826,5	598,247	80,231,3	526,604
Paper and Pulp	12	588,287,3	4,598,784	106,133,7	849,453	201,189,5	1,157,743
Wood	14	118,373,5	2,379,767	27,949,7	357,588	48,481,4	607,291
Metallurgy	16	32,715,3	530,454	6,748,4	121,505	1,438,2	18,743
Metal Forming	17	274,610,8	4,857,254	124,767,5	1,606,452	137,543,2	1,431,509
Machine Shops	18	367,458,5	3,180,640	148,000,0	1,156,717	263,444,6	1,140,355
Vehicles	20	50,477,5	675,980	5,699,4	138,668	19,731,9	312,957
Stone Products	21	30,303,1	590,685	9,221,7	143,893	15,988,9	311,974
Clay Products	22	13,003,7	241,195	23,725,9	176,104	1,451,5	17,290
Glass Products	23	18,419,3	281,423	33,060,5	147,371	12,644,9	28,513
Chemicals	24	130,214,9	1,714,908	88,598,7	1,121,152	48,896,6	412,275
Miscellaneous Manufacturing	25	104,767,5	862,106	26,085,4	190,326	20,707,5	103,346
Miscellaneous Construction	26	137,126,4	6,127,152	33,489,8	1,175,133	40,596,4	1,455,151
Erection	27	417,307,4	17,003,339	113,811,3	4,073,070	120,725,2	2,983,604
Shipbuilding	28	38,325,4	954,001	11,783,9	266,386	4,497,0	104,397
Vessel Operations	29	30,886,5	889,543	7,798,3	159,058	3,217,0	79,605
Stevedoring & Freight Handling	30	41,066,1	2,127,059	14,005,8	822,056	7,586,2	438,233
Railroad Operation	31	17,181,3	373,620	1,636,6	19,164	45,812,5	268,788
Cartage & Trucking	32	303,066,8	6,536,072	81,911,2	1,366,175	101,049,0	1,193,682
Public Utilties	33	117,760,0	1,983,627	24,037,9	317,877	88,441,1	728,689
Commercial Enterprises	34	1,660,359,5	19,198,423	341,819,9	3,286,423	486,934,6	3,596,463
Clerical & Professional Occup...	35	5,515,541,0	7,736,993	963,073,7	1,062,947	1,229,872,6	625,149
Operation & Maintenance	36	1,507,827,4	16,755,044	190,173,5	1,738,767	220,056,9	1,523,639
Miscellaneous Occupations	37	146,989,1	1,551,103	63,719,8	705,860	23,024,3	222,747
Code 7777						498,4	2,694
Totals (a)		$14,008,758,7	$120,290,994	$3,213,868,9	$26,618,552	$4,233,279,9	$25,586,280

(a) Data for risks on per capita basis, as basis of number of flying hours, or cabs, are not included.

* This experience was converted to the Ohio benefit level (as shown in Table V) by use of the following law differentials, based on calculations by the National Council on Compensation Insurance: Ratio of Ohio Law to New York .83
Ratio of Ohio Law to New Jersey 1.01

THE TWENTY-FIFTH ANNIVERSARY OF THE CASUALTY ACTUARIAL SOCIETY

The Twenty-fifth Anniversary of the Casualty Actuarial Society was celebrated in connection with the meeting held on November 16th. Two addresses were delivered at the afternoon session, by Mr. Leon S. Senior and Mr. William R. Williamson. Mr. Senior's address, entitled, "Reminiscences of a Charter Member," is printed herewith. Mr. Williamson's address on "Social Insurance" regrettably was not reduced to writing, and while he very kindly sent his notes for the address, it seems hardly possible to reduce them to written form. At the Society's dinner, held on the evening of November 16th, speeches were made by Mr. Henry H. Jackson, Mr. William J. Constable and Mr. Winfield W. Greene, and a poem, "The Lady Casualty and Her Servitors," was read by Mr. Clarence W. Hobbs. Of these, only the poem is available in manuscript form and is printed herewith.

REMINISCENCES OF A CHARTER MEMBER

BY

LEON S. SENIOR

ADDRESS DELIVERED TO THE TWENTY-FIFTH ANNIVERSARY MEETING OF THE CASUALTY ACTUARIAL SOCIETY NOVEMBER 16, 1939

I.

Twenty-five years ago, when our little group assembled to create the Casualty Actuarial Society, the politico-economic condition of the world was similar to that existing today. The nations in Europe were at war with the strong probability that America would be drawn into the struggle. The outcome of the war was unpredictable and the very future of orderly government among civilized peoples was in doubt. It was hardly a time for planning social reforms or for gatherings to pursue intellectual activities. And yet the brave minds who conceived the idea refused to retreat and courageously proceeded with the task, enrolling ninety-seven Charter Members as the nucleus for an organization destined to take a leading role in the development of sound principles for Casualty Insurance. Forty-eight out of the original group are still on the membership roll; twenty-two are listed in the Year Book among those who have passed on to their eternal reward. Accurate data as respects the missing twenty-seven is not available. Resignations, followed in some cases by visits of the inexorable Angel of Death, account for their absence from our circle.

Relatively speaking, twenty-five years is a long period in the life of a group such as ours. During that time the personnel of our membership has undergone great changes; old and prominent figures have disappeared from the stage, young and previously unknown persons have come to the front. Is it a symptom of age to exaggerate the value of bygone days and to deprecate the advance of youth? If so, I hope that you will not think of me as ultra-conservative if I speak more feelingly of the past than I do

of the present. And while it is expected of me to shed light upon the men with whom I have associated in the early days of the Society, I want you to believe me when I say that I have a high regard and deeply admire the new generation.

Nor am I quite sure that I am the right person to give the memoirs of a Charter Member. Out of the original group, I knew fairly well thirty-five men, while a dozen or more were close personal friends. This group of thirty-five has contributed heavily to the rise of our Society as an influential factor in Casualty Insurance. Their works are known to you because of their writings published in the *Proceedings*. It is not my purpose to give any detailed analysis of their contributions, but rather to describe as nearly as I can the more prominent personalities, together with such detached incidents as have left an impression on my memory.

If I had a skilful pen and could dramatize our past history, I would write a play with a prologue to present that immediate period preceding the organization of the Society when New Jersey, Massachusetts and New York were introducing compensation laws in their respective states. That was the period of experimentation, when the actuarial talent was struggling with the task of constructing so-called adequate and reasonable rates, largely by the use of imagination and data of an uncertain or dubious character. Act One would comprise the period from Rubinow, the idealist and social reformer, to Mowbray, the philosophic actuary. We had found our way and were gradually creating a statistical system for compiling experience. Workmen's Compensation had been subjected to scientific principles and methods which had become models for other lines of Casualty Insurance. The Second Act of the drama would cover the time from Mowbray to Perkins, when our minds began to turn from the narrow theme of Casualty Insurance to the broader sphere of Social Insurance. In the Third Act of our play the scene would be set for the realistic presentation of plans designed to take cognizance of serious competitive handicaps and of conditions that call for gaining the good will of policyholders who have become restless under the ever increasing burden of taxation, including the form of taxation represented by insurance.

My memory goes back to the early days when the subject of Workmen's Compensation was debated at public meetings under

the auspices of organizations such as the National Civic Federation. Insurance executives, including Theodore Gaty, Frank Law, Louis Butler, Charles Holland and Duncan Reid, showed an active interest by their presence and participation in the debate. Without appearing immodest, I may remind you of the Senior-Whitney draft of a compensation bill which became known as the Foley-Walker bill, ultimately to be vetoed by Governor Sulzer. Mr. Foley is now a Surrogate in New York County and Mr. Walker is the same Jimmy Walker who at one time served as Mayor of the City of New York. Foley was in the Senate, while Walker was in the Assembly. There may be persons in this audience who still remember the hearing before that Governor who, in the course of the meeting, skilfully expectorated tobacco juice in a large brass cuspidor which adorned the executive chamber. It is not improbable that the veto of this bill contributed, in part at least, to Governor Sulzer's downfall by way of impeachment.

And there may be others in this audience who remember another hearing before Governor Glynn when a new piece of legislation, drawn with the aid of Miles M. Dawson, came up for consideration on the question of rates. The Governor divided the companies into two groups—those for high rates and those for low rates. The question revolved on the issue as to whether the factor of 1.90 over and above the Massachusetts loss costs, as estimated by Benedict Flynn, should prevail as against the factor of 2.58, calculated by my good friend Winfield W. Greene with my consent and connivance at a time when he was my adviser on actuarial matters in the New York Insurance Department. The story is told in a very entertaining manner by Winfield in a recent address before the Insurance Federation of Minnesota. He has advisedly or unwittingly omitted, however, to mention one or two important details.

Henry D. Appleton, the First Deputy Superintendent of the Department, in whose mind the reputation of the Department stood above everything else in the world, caused Harwood Ryan to come to Albany, where he worked behind the scenes checking up the figures submitted by Messrs. Flynn and Greene. This work was done in a mysterious and secret manner, and when the Governor decided on a compromise factor of 2.00, I always had the feeling that it was due to Ryan's work. It turned out, how-

ever, that the final premium rates did not reflect any of the factors determined by Messrs. Greene, Flynn and Glynn. This for the reason that the committee which had selected the Massachusetts pure premiums boosted some of them above the indications to an extent which raised the total Massachusetts losses 21% before the multiplier of 2.00 was applied. Thus destiny took charge of the situation in spite of actuaries and governors. And here is another amazing point. A retrospective study of the New York Workmen's Compensation Experience, for the period during which the initial rates were in effect, shows that the average actual loss ratio for policy years 1914 to 1916 inclusive was 63.8%. This was determined by the premiums based on the use of the actual 2.42 differential. If 1.90 had been used, the loss ratio would have been 81.3%. If a differential of 2.00 had been used the loss ratio would have been 77.2%. But if the factor 2.58 which I urged upon the advice of Mr. Greene had been accepted, the actual loss ratio would have been 59.8%, which is amazingly close to the permissible loss ratio for New York. Without appearing resentful, but in the interest of historical accuracy, I may remark that Mr. Greene at the crucial moment deserted me, resigning to join the State Insurance Fund as an assistant to Jos. Woodward, but he deserves a great deal of credit for the ability with which he made his early calculations from data hardly adequate for the undertaking. His subsequent career in the field of Casualty Insurance justified my original confidence in his selection for the work.

The Foley-Walker measure was an all-inclusive statute with the usual exception of farm and domestic labor. The authors of the Dawson bill, fearful of constitutional objections, adopted the Canadian principle, enumerating hazardous occupations, a form of legislation which resulted in a great deal of litigation on the question of coverage to the joy of the lawyers and to the distress of the claimants.

One of the most interesting episodes in the drafting of the New York Workmen's Compensation Law occurred at the Hotel Knickerbocker, which was then located on the southeast corner of Broadway and Forty-second Street. It was a meeting held late in the evening and lasted until midnight. Those present at the meeting included James J. Hoey, then a Deputy Superintendent in the Insurance Department, Senators Wagner and Foley,

both serving in the State Legislature, Mr. Bradbury, an attorney who was the author of a work entitled, "Bradbury on Workmen's Compensation," and who is no longer among the living. I was also present at the meeting. We were hammering out laboriously one of the early drafts, and the thing that sticks in my mind is a discussion relating to the subject of alien dependents. I felt that my co-workers on the draft were not only ultra-conservative, but particularly unfair to the dependents of American workmen who resided abroad. They insisted on cutting down the benefit 50%, something against which I bitterly protested and made an eloquent but unconvincing oration. I pointed out that all present were either of foreign origin or descendants of aliens, and I could not see the justice of reducing the benefit in the case of a workman who died in America as a result of an industrial accident, leaving a widow or dependent mother in Ireland, Italy or any other part of the European Continent. Of course at that time, I was too naïve to appreciate the complications involved in settling claims for alien dependents. Needless to say, my protest was of no avail and the principle of cutting down benefits for alien dependents remains a feature in most Compensation Laws in the United States.

II.

Following enactment of the new legislation, we made a brave attempt in the Department to prepare a Standard Workmen's Compensation Policy. In the midst of our labors, I received a telephone call from Edson S. Lott, then President of the United States Casualty Company, asking me to come down to see him about the work. I felt pretty sensitive then about the importance of my position in the Department, and in my youthful pride I replied to Uncle Edson in so many words that if he had any ideas on the subject the thing for him to do was to come down and see me in my office in the Department. I made an appointment for the following day at 10 A. M. Sure enough, accompanied by Mr. Kidder, he appeared with due humility at the appointed hour. As my room was too small to accommodate three persons, I invited my visitors into the Superintendent's office which contained a desk, a few chairs, but no table. The equipment was far

from comfortable and after discussing the policy form for two or three hours, my *amour propre* having been satisfied, we agreed to meet the following day in Mr. Lott's office, where we found all the conveniences among well-arranged executive furnishings, and there we continued to work to our mutual satisfaction.

That, however, was not the end of the policy form. Months later we had a general meeting of the companies and a meeting before the Industrial Commission, at which time Walter G. Cowles and others had an opportunity to present their ideas on the subject. Mr. Cowles and I, who clashed at the time, were told to get together. A final agreement was reached in the course of a meeting in Hartford attended by Walter G. Cowles, Robert J. Sullivan, Frank G. Morris, Dr. R. S. Keelor and myself. A stenographer was present. In order to satisfy my sense of importance, they made me Chairman of the meeting, Mr. Sullivan acting as Secretary. It amused me to watch the face of the young woman stenographer who would not take any dictation from me without looking up to Mr. Sullivan in order to get his assent. Needless to say, the policy form was modelled along the lines devised by Mr. Cowles.

The first bureau to deal exclusively with the administration of workmen's compensation rates was organized in New York and was followed by similar organizations in Pennsylvania, Massachusetts, New Jersey, Wisconsin, Minnesota and California. When Pennsylvania was about to organize a Compensation Rating Bureau, Dr. Downey invited me to attend the organization meeting. On my trip to Philadelphia I was accompanied by Duncan Reid and Charles Holland. We stopped at the same hotel. While I was expected to be helpful in Dr. Downey's effort, I was cautioned not to show too much enthusiasm because of opposition on the part of several companies that were not much in love with the growing crop of independent bureaus. However, when I was called upon to express my thoughts, I threw aside all restraint and spoke out quite freely in favor of the project. Most of the companies that attended the meeting accepted the inevitable. The only protest, I think, came from R. J. Sullivan. Dr. Downey, with the support of the State behind him, used the steam roller and the Pennsylvania Bureau became an established fact.

In time it became evident to the companies that if all the States

were to have separate independent bureaus, underwriting complications dealing with forty-eight different jurisdictions would make it difficult to transact business. Consequently cooperation on a national scale was indicated, and so the National Council was formed to provide a degree of uniformity in dealing with workmen's compensation matters. At the meetings held for the purpose of organization, John T. Stone was an active participant. I presided at the meetings and when I indulged in making speeches from the Chair it was Mr. Stone's custom to call a halt and to point out that the Chair's privileges were limited. On such occasions I usually yielded the Chair to Mr. Leslie and took the opportunity to state my ideas from the floor.

Dr. Downey, who exercised dictatorial powers in Pennsylvania on affairs relating to workmen's compensation insurance, was a fine character, sincere and enthusiastic in his work to the point of fanaticism. I had a great deal of admiration for him and spent many hours in conversation with him at luncheons and at meetings, but I must confess that his conversation at times became very tiresome since it dealt principally with the subject of accident statistics. Gregory Kelly was a devoted follower of Dr. Downey, conforming to his ideas in every respect.

III.

It is the custom of the Society to re-elect the President for a second term by the unanimous vote of the Fellows present. I recall two exceptions; one happened in my own case. When I ran for a second term there were one or two votes cast for another candidate. The same thing occurred in the case of Michelbacher's election. The opposition to me was undoubtedly due to a sincere feeling that I was not qualified nor entitled to a second term. The opposition to Michelbacher apparently came from Fellows who disagreed with him on certain fundamental questions and regarded him as a hidebound devotee of stock insurance. When the vote was finally announced and the President declared elected by a majority vote, Michelbacher showed his chagrin by the exclamation, "Well, this is better than a sock in the nose!"

In reading the papers published in our *Proceedings,* one finds very little material tinged with frivolity or humor. The authors

who concentrate on their special themes seem to feel that a touch of gaiety might spoil their serious efforts. In Michelbacher, however, I find an exception to the rule. There are several good stories in Gus' writings which call for laughter and applause. For example, one may find amusement in his description of an official hearing before the commission in a western state, where he made a valiant effort to define a policy year as distinguished from a calendar year. That the meeting broke up in confusion was certainly not the fault of Michelbacher. Another of his stories which brings out a feeling of joy is the one where an insurance commissioner in the sunny south was successful in collecting the life insurance benefit for a woman whose husband wasn't much good and who became a widow through the process of liquidation by the commissioner. A third of his famous anecdotes that carries an element of tragedy is the one where a certain character asked for and was given the privilege to know a year in advance the quotations on the stock market. Here was a chance to become wealthy without much effort, but the newspaper which carried the quotations and which the character in question was privileged to read in advance, also carried a paragraph of the reader's obituary.

Excluding the speaker, we have been rather fortunate in our selection of men who served as Presidents of the Society. Mostly they were men of conspicuous talent, who have acquired high standing in the profession. But of the lot, two men of outstanding qualities come to my mind. In describing Rubinow and Woodward, I recall somewhat to my own surprise two contrasting personalities, but with strong resemblance in their intellectual characteristics. Woodward, the product of New England culture, princely in bearing, charming in manner; Rubinow, the Russian emigré, descendant of a race which suffered persecution through the ages; both possessing a versatility of mind which finds expression in their classic contributions to our *Proceedings* that cover a variety of themes in the field of economics and social sciences.

For a year or more Jos. Woodward had been perfecting himself in German with the expectation of making a trip to that country for the purpose of studying the German insurance system. He made the trip in company with Charles Hughes, fully expecting to bring back important information which could be incorporated in a report for the guidance of American actuaries. However, the

journey proved to be a complete disappointment. I understand they were cordially received by the insurance officials in Germany, but the information they obtained was of a very meager sort. The disappointment weighed heavily on Woodward's mind and resulted in a nervous breakdown, from which it took him a long time to recover. Mr. Hughes wrote a brief and amusing report on their German experience which, however, contained very little information of a scientific character.

Frederick Richardson has been one of the colorful figures in our Society's discussions. His fine literary style and his classical treatment of insurance problems were helpful in arousing the interest not only of our members, but of guests who were privileged to attend the meetings. At the farewell dinner on the eve of his departure from these shores to his native land, he made a stirring address, in the course of which he gave me a generous measure of credit for the circumstances which brought about his appointment as U. S. Manager of the General Accident. His absence from our midst is to be regretted.

Of all the men who graced the Society by their skill in debate, Arne Fisher was to my mind one of the most remarkable. He could add zest to the driest kind of a mathematical discussion, being himself a vigorous critic. He probably was, although I am not sure, a native of Denmark, for I recall that his favorite remark was, "There's something rotten, but not in Denmark." Like Downey, he was particularly fond of attacking Whitney's theoretical speculations on experience rating. When he dropped out from our circle we lost one of the most interesting figures in our gallery of talented men.

IV.

The French expression, "*autres temps, autres moeurs,*" may be paraphrased to read, "Other times bring other men." In the course of years many changes have taken place in the personnel of the New York Department and in the bureaus dealing with rate supervision.

I recall that Charles Hughes, who was Chief Examiner of Casualty Companies, was appointed General Manager of the Workmen's Compensation Service and Information Bureau organized

by the Stock Companies. Unfortunately, Charles met with an accident while riding horseback in Central Park, a form of sport wholly unsuitable to an insurance actuary. He was laid up sick for a long time and upon recovery resigned and returned to the New York Department. Professor Whitney, who was brought in from California to assist in problems arising out of Workmen's Compensation, remained but a short time with the Department, when he was picked up by the companies to succeed Mr. Hughes as head of the W. C. Service and Information Bureau. Associated with him at the time was Carl M. Hansen, the author of the "Universal Analytic Schedule," the principles of which were adopted in the first Merit Rating Plan approved for New York and other compensation states. Mr. Hansen was not satisfied with limiting himself to industrial safety work, a field in which he acquired a national reputation. His dreams of expanding into larger promotional spheres brought him to a point where his usefulness to insurance came to an abrupt end. In addition to Whitney, the roster of California sons who have become Fellows of the Society is quite impressive because of the careers which they have carved out for themselves and the high places which they have attained in the world of insurance. These include Mowbray, Leslie and Roeber. All three have played important roles in casualty ratemaking organizations.

In the interval between Charles Hughes and Albert Whitney, the Bureau was under the direction of Mr. Stanley Otis. When John Train and I came in to examine the Bureau, the statistical work of that Bureau was rather negligible. All we could see was a clerk copying by hand experience on stevedoring work. We had been told that the companies were very mysterious about their experience and disinclined to give statistical results. In fact the story is told that in the days of the Liability Conference, the executives who met around the table kept their papers under the table for fear of showing the data to their neighbors. In the Bureau we observed frequent meetings of a so-called Reference Committee comprising Messrs. Ernest C. Higgins of the Aetna, Wm. J. Johnson of the Fidelity & Casualty and A. M. Payne of The Travelers. One of the chief functions of that Committee was to cuss the Casualty Company of America and DeLeon, its President.

When I resigned from the Department in 1914, I was succeeded by Harwood E. Ryan. Harwood Ryan was tremendously earnest in anything that he undertook. I recall an occasion when Ryan, Woodward and I were called to Washington to help the Treasury Department in developing a plan of war risk insurance for the soldiers who went across with the A. E. F. We were cordially received by the authorities and assigned to a cell-like room in the Treasury Building where we labored day and night for several weeks. There came an evening, however, when relaxation was in order and I proposed to Ryan that we spend the evening in the theatre to see a new musical comedy which had just opened in Washington. Ryan endured the performance for an hour or so, but before the end of the first act he skipped out, went back to the Treasury Building and continued to work on the war risk plan.

When Ryan resigned to become in due course the head of the National Council, he was succeeded by William Leslie. When Leslie resigned to become in his turn the head of the Council, he was succeeded by Charles G. Smith, who later on entered the service of The State Insurance Fund. Smith had an acute analytical mind. He was a clear thinker and a plain speaker. Unfortunately he was unable to cope with his political environment, and his career was cut short as a direct result of bitter disappointment in the State service. I have a feeling that he died of a broken heart. His versatility was nothing less than amazing. His interests covered a variety of subjects. He was musical and played the piano with the touch of an artist; he was an expert at chess; he took a keen delight in tennis and other athletic sports; he was well-equipped as an actuary and mathematician; he was a student of corporate management and a successful administrator of a large insurance organization.

An interesting episode occurred as an incident to my friendship with Harwood Ryan and Charles Smith. It was in the early '20's when Smith, who was domiciled in Albany as the Actuary for the New York Insurance Department, somehow managed to get hold of a second-hand car. It was a Flanders, a make now obsolete and probably a poor imitation of a Ford. It was his ambition to drive the car from New York to Albany, and to keep him company he invited Ryan and myself. I had been taking lessons in a night course on automobile repair over on Bedford Avenue in a

Brooklyn Y.M.C.A. Having acquired a reputation as an expert, I was to be the mechanic on the road. Smith was the pilot and Ryan performed the duties of a photographer, taking Kodaks as we went along. We started in Flatbush and managed to get as far as Bedford Avenue, when we were stopped by a cop because of the clouds of black smoke following our progress. All the learning I acquired in the Y.M.C.A. deserted me in the crisis, but somehow "by hook or crook" we managed to get as far as Poughkeepsie. It took us nearly a whole day to cover that trip. We arrived in Poughkeepsie dead tired and spent the night in the Old Nelson House. Ryan and I returned home after sending telegrams to our families, while Smith continued with his car, reaching Albany, where the contraption fell apart to be assigned to the junk-shop.

Sam Deutschberger, with the aid of Jos. Magrath, reorganized the Rating Bureau in the Department, assuming jurisdiction over all ratemaking, including Casualty Insurance. Deutschberger was the soul of honor, a bear for work, a lover of justice and a hater of injustice. He was known to have had perpetual quarrels with Willis O. Robb of the New York Fire Insurance Exchange. In speaking of Deutschberger, it may be truly said that his heart belonged to the downtrodden policyholders, cruelly treated by that organization. Both men have since gone to the Great Beyond. I always had a feeling that Deutschberger's life was cut short because of too much work. Towards the end of his career he undertook to study law at night. This, together with his ambition for the work in the Department, must have weakened his resistance and hastened his end. In the Department he was considered to be so dependable that Jim Hoey often said he "would trust him with his life," and these words were repeated in the eulogy offered by Rabbi Stephen Wise at the funeral service. Deutschberger enjoyed the company of Charles G. Smith and Harwood Ryan. When the three got together there was an exchange of wit and esoteric wisdom, of stories gay and humorous, but never one that could be termed risqué. To be in their company was a privilege. To listen to their conversation was a delight. It makes me sad to think that this trio is no longer with us.

V.

When I examine the *Proceedings* I find, to my surprise, a remarkable versatility in the character of the papers submitted notwithstanding the limitations of our special field. In the years 1918 and 1920, Craig and Flynn have presented papers on the economic and social problems of the World War, subjects which are of timely interest in the present conflict. If one favors philosophical discussions on insurance in its relation to human conduct, where can one find a more valuable treatise than that entitled, "Insurance and Human Behavior" by Jos. Woodward? And as far as mathematical subjects are concerned, there is a wealth of scientific material presented to the inquiring mind.

Albert H. Mowbray takes first honors as the most prolific contributor to the published works of the Society. Aside from four Presidential Addresses, Mowbray delivered seventeen papers of a scientific character dealing largely with actuarial procedure and ratemaking. In addition he submitted twenty-six oral and written discussions. The second place belongs to Gustav Michelbacher. Four Presidential Addresses, twelve papers and seven discussions stand to his credit. Rubinow takes third place. His contributions were largely made in the early days of the Society. Due to pressure of other activities, mainly social and philanthropic in character, he was not in a position to make frequent contributions after his retirement from the Presidency in 1916. The works he left behind him are of an outstanding quality. He was one of the first to deal with Unemployment Insurance, submitting a paper on the subject at a meeting in May, 1928 and again a written discussion of Mr. Kulp's paper at the meeting in November, 1933. On the occasion of the Twentieth Anniversary he wrote a most remarkable letter which was read before the meeting in November, 1934.

On statistical problems we find important contributions from Cammack, Flynn and Kopf. On the development and refinement of merit rating there is important material from the pens of Downey, Hansen and Ryan. Walter G. Cowles was an early writer on the subject of Aircraft Insurance. Whitney gave us the fundamental theory of schedule and experience rating.

When I think of this prodigious material available to the

younger set who have joined our circle, I am reminded of the proverb that "A wise old man's shadow is worth more than a young buzzard's sword." Youth has been well served by this intellectual feast.

Of the executive talent who contributed most to the progress of Casualty Insurance, but who are no longer with us, we may include Louis Butler, R. J. Sullivan, Theodore Gaty, Frank Law and S. H. Wolfe. Louis Butler was a fine executive, a self-made and determined character, one who did not tolerate contradiction or opposition. R. J. Sullivan possessed remarkable ability as an underwriter and shone as a brillant speaker at meetings where liability men were gathered. At times it had been my fate to clash swords with him in friendly but serious debate, where opinions were expressed with emphasis and without kid gloves. He gave me the impression of being the *deus ex machina,* the figure of a god who solved the superhuman difficulties in the world of Casualty Insurance. Theodore Gaty bore a fine reputation as an underwriter; Frank Law as a profound student of mathematics and engineering. Reid, Holland and Train, strong supporters of a sound cooperative rating system, are largely responsible for the several forms of rating organizations which came into being on the emergence of Workmen's Compensation. In the sphere of actuarial talent, I greatly miss the presence of Jos. Woodward and Roy Wheeler, both men of broad vision and liberal ideas.

It is a satisfaction to know that we still possess a long and important list of outstanding personalities. It will take a volume on pioneers in casualty actuarial science to depict their traits and to describe their contributions in our field. By way of illustration, I have selected three who possess unique qualities. My first witness is Sid. Pinney whose ingenious mind and unconquerable spirit have delved deeply into the mysterious labyrinth of Retrospective Rating. My second witness is Grady Hipp, the special pleader for solvent Special Funds, an intransigeant fighter, battling with me when I am right and against me when he *thinks* I am wrong. And for a third, I call Ralph Blanchard, the philosophical observer of our disputes, who usually takes no particular side in an argument, weighs and analyzes the pros and cons without giving an answer. He is perhaps the most reasonable and, therefore, the

most just in arriving at a conclusion. On only one occasion did I see him aroused to the point of attack, and that was in a memorable discussion when he confronted Martin Lewis on the subject of Surety Rates.

Just a word about the ladies of the ensemble. While the contingent of women who have been admitted to membership in the Society is numerically small, they have demonstrated ability to cope with the problems presented in our papers and discussions. Emma C. Maycrink has been the most prominent contributor to the activities of the Society and has been helpful in encouraging the more reserved sisters to come to the front.

Some of you may know that Miss Maycrink's service in the Insurance Department was punctuated by an intermission, during which she helped to organize the Statistical Department of the New York Board. In order to get back to the Department after her service with the Board, she was obliged to take a civil service examination, but she made no mention of it to me, nor did she give me any hint of her desire to return to the Department. The civil service examination consisted of two parts—written and oral. Of course, she passed her written examination with *flying colors*. When she came up for the oral examination I wish you could picture to yourselves the surprise when she found me in the room as one of the committee of examiners. Her classic features turned crimson and her blue eyes carried an appeal, "Please don't be harsh with a lady in distress."

Barbara Woodward has published a very fine paper on "Aviation," and Elsie Kardonsky has demonstrated an aptitude for actuarial work which holds the promise of a bright career.

VI.

And now I think I had better conclude before I get too sentimental; before my eyes become moist and my vision obscured by tears of regret over the glories of the past. I do not want you to think that I am bragging, but really those old Fellows who formed the Society were *some pungkins* (using the expression in a complimentary sense). Their deeds and achievements have been perpetuated in the written word and will remain as a lasting

memorial to their prodigious talents. To use a Russian proverb: "What is written with the pen can't be chopped out with an ax."

But my affection for the Old Guard does not lessen my confidence in the ultimate success of the younger set. Twenty-five years hence another speaker will tell of his reminiscences of the twenty-five years to come, and will prove to you that the second period was even greater than the first. Because of the strict system of examinations, the second period should produce a finer crop of actuaries than the first. Fortunately the Charter Fellows were not subjected to the humiliating process of examination. If they had been, I would not be here to tell this story.

I am reminded of the brief speech made by Mark Twain when he introduced Winston Churchill to an American audience. "Ladies and Gentlemen," said he, "the lecturer tonight is Mr. Winston Churchill. By his father he is an Englishman; by his mother, an American. Behold the perfect man!" And so I say to you, the young men and women admitted to Fellowship in this Society, by the first Four Parts you are an Associate; by the second Four Parts you are a Fellow. Behold the perfect actuary!

In the short period of twenty-five years we have witnessed war and peace, revolution and reaction, prosperity and depression, attempts at social reforms and endeavors to reconstitute political and economic philosophies of this and other nations. Notwithstanding progress in mechanical inventions, the human asset remains just about the same. Regardless of history or in spite of it, the forces which make for civilization seem to swing back and forth like a seesaw, now rising to heaven in search for noble ideals and then back again to earth and the twilight of barbarism. In the hope of salvation, the crowd surges forward and backward to listen to false doctrines or to be guided by strange ideologies, fascinating at the first view, but deceptive in the end. At least the memory of the twenty-five years which have gone by is worthwhile. For many of us they have been undoubtedly years of sorrows mingled with joys; victories achieved and defeats sustained. But we may be proud if we can say with Rudyard Kipling that we have learned to "meet with Triumph and Disaster, and treat those two impostors just the same."

THE LADY CASUALTY AND HER SERVITORS

Verses Written on the Occasion of the Twenty-Fifth Anniversary of the Casualty Actuarial Society

BY

CLARENCE W. HOBBS

It was in the spring of the fateful year of nineteen twenty-three
That I chanced to meet with a winsome dame of manner blithe and free.
And her hair was of gold, and her garment's fold made the rainbow's hue seem pale,
And she rode on a wheel that sped like the wind along a sinuous trail.

And the lady smiled and beckoned and said, "Come hither now to me.
Some call me Miscellaneous, but my true name is Casualty.
I am she whom no convention holds, nor rule of reason binds,
And I take all chances a lady shouldn't with all the Multiple Lines."

"And I've a crew of stock companies true, companions ripe and rare,
And those who share their mutual woes and mutual burdens bear,
Reciprocals, Lloyds, and the jolly State Funds that give insurance free,
And the way they love and trust each other is really a joy to see."

"Now if you've a taste for tragedy, combined with much that is comic,
Then come and take a ride with me on the Cycle Economic;
And first we'll go up, up, up,
And then we'll go down, down, down,
And then we'll go backwards and forwards,
And then we'll go round, round, round."

And I fell for the tale of the blithesome dame, and I got me up behind,
And for the ensuing sixteen years I've labored my step to mind
In the company true of the goodly crew who labor in every season
To try to keep the masterless jade within a rule of reason.

For this is what my Lady said as we started on our ride:
"Note well my goodly Executives who joy in power and pride;
Note well my Boards of Directors true, whose thoughts are mainly of pelf;
And my Agents, who serve their companies with never a thought of self";

"My Underwriters, who know so well how riches should be made;
My Claims Men, skilled to find excuses why claims should not be paid;
My Lawyers, who give opinions sage, when weighty troubles press,
Consisting of 'Yes, but maybe no,' or 'No, but possibly yes.'"

"Now what do you think is the place for you, who have wasted your golden hours
With trifles like law and politics and commissarial powers?
Your mathematics you have forgot, which is quite O. K. with me.
Believe it or not, an Actuary is what you're going to be."

"Now this is no mock at the learned crew, nor merely a light-heart jest;
For of all my many-named servitors, I love Actuaries best,
Like Dorweiler, who has an index number for each of my manifold frolics,
And Perryman, who would conquer my curves with cubical parabolics."

"Most serious-minded men are they, yet not without sense and wit.
They believe in truth, and they tell it, too—whenever their bosses permit.
They believe in reason, that golden dream, and close-knit logic true.
They even believe in their formulas—so they may believe in you."

"Graphs and factors of many kinds, statistics and tabulations,
Loss-ratios, rate-levels, manual rules and oodles of classifications,
Differential equations, and interpolations, and Charlier's curves, indeed,
These shall be to you as an open book that will put you asleep to read."

"You shall sit and list to the tense debate on problems recondite;
You shall edit the screeds of the master-minds, more skilled to think than to write;
You shall sit at the feet of Winfield Greene, that slug-horn tooter tough,
Or become a second Michelbacher—though one is quite enough!"

"Now, therefore, be free of the company that toys with the laws of chance,
And bend to receive my accolade—a kick in the seat of the pants;
And ere you know it, you shall become an F. C. A. S. indeed,
With those other sterling actuaries, Jess Phillips and Duncan Reid."

And now, good Fellows, Associates too, assembled to celebrate,
Our honorable Society's twenty-fifth anniversary date,
Grave charter members and bureau managers, stand up and testify,
That what our Lady said to me of the Cycle's course was no lie.

For our Society's cycle began with war on land and sea,
And up and down and up again went our business of Casualty.
It soared as Coolidge prosperity swelled high the hopes of the nation,
And it sank to most abysmal depths with depression and deflation.

Ah, those were the days of bewildered minds and highly jittery nerves,
Of strange ways to value securities, and to figure loss reserves.
Yet most of our companies weathered the storm, though some were whelmed in the sea,
And others came safely into port with the help of the R. F. C.

And what shall we say of the after-time of economic confusion,
When our business sped gaily round and round with the social revolution,
And, despite the blandest assurances that all had been wisely planned,
Entertained, perchance, a lingering doubt as to where it was going to land.

And now to war on land and sea the cycle has brought us again,
And the prophets of doom like frogs croak loud their pessimistic refrain,
Of civilization going to hell, of a world collapsing in woe—
In fact, exactly the song they sang just twenty-five years ago.

Now men and nations and civilizations at some time or other must go,
For fundamentally naught stands still; all things are in flux and flow;
And less to be feared is the advent swift of the dreadful Judgment Day,
Then the languid course of the weary years of mouldering and decay.

We who serve our Lady Casualty should be of all men the first,
Most resolutely to hope for the best, most wisely prepare for the worst;
For we move among possibilities of every peril known;
We take all chances our Lady takes, and add a few of our own.

The quiet office and soft-seat chair are not our chiefest of joys,
Though welcome enough to one of your editor's years and avoirdupois,
Nor is it one's lot in ordered routine and security to dwell,
An intellectual oyster in a mathematical shell.

For we deal with knotty problems of law, of claims and of underwriting,
With legislation's changeful moods, with politics and with fighting.
We sit on committees, we're out on the road; no labors may we shirk.
We're the only kind of actuaries who die from overwork.

We take a plenty of lusty kicks in places where it hurts.
We receive a remuneration that falls far short of our high deserts.
But we bear our labors and tribulations with never the slightest fuss,
For it all comes of the exceeding love our Lady bears to us.

When our game is done, the features we'd like to linger in memory,
Are the lucky par on the long sixteenth, the birdie on Number Three;
But the foursomes that follow after will give more heed, perhaps,
To the divots we dug, the balls we lost, the hoofprints we left in the traps.

Where are the scrolls that Omar Khayyam once filled with his writings wise,
On mathematics, philosophy and the ways of the stars in the skies?
Little after nine hundred years of his learning yet remains,
But men cherish the verse of his lighter hours, his bitter-sweet quatrains.

Full of the essence of life are they, most human, most benign;
Of the joy of love, of the rapture of song, of the red, musk-scented wine,
Of the wonders of life and time and fate, of the glory of sun and star,
Of Allah the just and compassionate who made men as they are.

Full little of life and less of thought can be measured, plumbed and weighed.
Statistics, formulas, tables, graphs, the tools of our learned trade,
May grasp the shadows of life alone, and well if we do not find
That after much shadow-chasing we are to its glorious essence blind.

Like Omar be we wise enough at our lore profound to smile,
And hold living strongly and joyously the only things worth while.
Let us give due heed to the word that was said by the author of 'Israfel':
'If a mathematician would reason, he must be a poet as well.'

Let us take to heart the saying profound of Spinoza the grave and wise,
A saying which should be set before every office-worker's eyes:
'The more the body is capable of all kinds of activity,
The more the mind becomes of the essence of immortality.'

True thought is no pallid, deedless dream: true thought is fervor and fire.
It radiates potent will to do; it flames with strong desire;
It withers all inhibitions and sets the eager body free,
To transmute the glorious vision into living reality.

So don't fade into the background dim for fear that you might get hurt;
Don't hide in the sand like a soft-shell clam and express yourself with a squirt;
But stand on your feet in the bright sunlight in the fashion of a man,
And express the thoughts that are in your soul in every way that you can.

Tonight we sit in good fellowship: tonight we're alive at least.
We've somehow discovered the wherewithal to pay for this birthday feast.
We can still achieve a laugh robust to banish the thought of sorrow,
And nourish a stalwart faith and hope to stead us against the morrow.

So now our goodly Society we hail with three times three,
As it rounds the happy milestone of its quarter century;
And while our Lady's service does not favor longevity,
When the fiftieth anniversary comes, may we all be there to see!

ACTUARIAL NOTE: PROGRESS IN PENSION THOUGHT

BY

RAINARD B. ROBBINS

Time was when if Jones received a pension, he had seen at least some semblance of service in some war. If widow Jones received a pension, her beloved husband had seen such service; she may have suffered with him in the days of the armed conflict, or hers may have been one of those economical marriages with half a century's difference between the ages of the contracting parties. This paper will have nothing more to say about such pensions.

Late in the nineteenth century planning of pensions began for workers in industry. The railroads were pioneers in this development, even though their planning came to be a case of arrested development. Other industries followed in a somewhat desultory rather than a systematic manner. Along with this growth in planning for industrial pensions came even a more marked tendency to arrange for the pensioning of public employes,—especially those in the more hazardous occupations, such as firemen and policemen.

In the early days many of these plans consisted of little more than announcements of intent to pension. Industry was young and was growing rapidly, and the undertakings that were prospering were the ones that made these pseudo-promises. Only within the last twenty-five or thirty years has very serious thought been given to the source of funds with which to pay pensions. Even in recent years pension promises have been made glibly, and usually in good faith, with the thought that since the cost was relatively insignificant, little attention need be given to provision for payment. Unfortunately some employers have announced their intention of pensioning old and faithful servants, seemingly for the purpose of avoiding labor troubles and with no serious expectation of any burdensome pension payments. After all, to announce a pension scheme didn't imply that any particular person should be kept in service until he reached pensioning age, did it? And besides many of these plans required long years of continuous service to qualify a person for a pension.

It is encouraging, however, to note that the pension idea, like

many others, began as a crudity under severely competitive employment conditions and has developed in time into something much more attractive. As major industries developed more responsible administrative units and as the passage of time disclosed the seriousness of the responsibility for financing pension promises, more careful attention was given to the promises themselves and to provisions for meeting them.

In the early days a pension was thought of as a gratuity; it was something given by a grateful employer out of the goodness of his heart—something that he was under no obligation to furnish. It was given in recognition of long and faithful service; still it was a gift. When the magnitude of pension loads began to be appreciated, the suggestion was made that the employe contribute toward the funding of his prospective benefit. This was not a new idea, but growth in its popularity was definitely linked with realization of difficulties in meeting the cost of free pensions. And so we find that during the last twenty years most of the well-grounded plans for retirement income have called for contributions from workers whether in industry, in public service, or in professional service of one kind or another. Along with this change came discrimination in the use of words to designate these benefits. In some circles the word pension is reserved for a benefit financed by the employer; by some this word is limited to non-contractual benefits that claim the designation "gratuities." In contrast, the benefits that have more nearly a contractual basis are called annuities, retiring allowances, retirement benefits, or retirement annuities. No effort will be made here to follow a strict allocation of particular words for benefits of particular types.

Another development of the last twenty years or so in this country is the funding of prospective retirement benefits through deferred annuity contracts of life insurance companies, calling for periodic premiums during the working years of the prospective pensioner. Many of the more progressive industrial employers have entered into group annuity contracts with life insurance companies for the funding of benefits to be available to the employes upon the completion of a specified period of service or the attainment of a specified age or both. Many colleges and universities and some other institutions have cooperated with staff

members in the purchase of individual deferred annuity contracts with something of the same objective.

The development of group annuity contracts has placed the funding of industrial pensions on a much sounder basis than was usually practiced twenty years ago. Furthermore, requirements of soundness have resulted in more cautious promises than were common in earlier days. But, as to the extent of this movement, when the Social Security Act was adopted in 1936 it was estimated that not more than 350,000 workers were covered by group annuity contracts. In fact, all the workers in industry with any kind of pension expectation, however poorly founded, did not in the year 1932 exceed 4,000,000 in number, judging from figures given by Murray Latimer in his encyclopedic work entitled "Industrial Pensions in the United States."

Thus when the Social Security Act was proposed only a very small proportion of industrial workers had any expectation of retirement income resulting from their employment. The depression years following the crash of 1929 brought the conviction that competitive industry could not hope to arrange reliable pension expectations for any substantial proportion of its workers, and it seemed hopeless to expect retirement plans established in competitive industry to arrange to any substantial degree for pension credits that would bridge across gaps in employment or shifts from one employment to another.

Nearly all of the provisions for retirement income arranged by colleges and universities for their faculty members had both of these desirable characteristics. But in industry a worker who left an employer who had arranged for retirement benefits usually received in a lump sum an amount equal to the sum of his contributions, or these contributions accumulated at interest. He usually had no opportunity to retain this pension credit as such and usually lost any benefit from employer contributions that might have come to him had he remained with the original employer until retirement. The person who stays with a particular employer in this country throughout most of his working years is the exception rather than the rule. This is partly due to competing opportunities, including that of becoming an employer; unfortunately it is due in no small part to irregularity of available employment and to a high mortality rate among employing organizations. While

reliable statistics would be difficult to obtain, it is common knowledge that if pension expectations are to be of substantial value to a large proportion of our workers, they must survive changes of employment.

Hence we come to difference in objectives of industrial pension schemes and the old age and survivor provisions of the Social Security Act. The individual employer usually takes the view that the success of his business must be his principal objective. If he establishes a retirement plan, it is for the protection of his business rather than for the benefit of his workers. Competitive pressure, if nothing else, may drive him to a very narrow view on this subject, and until recent years the most common attitude was that an employer could not afford to contribute to any extent toward retirement income for those workers who did not stay with him until retirement. It is gratifying to note that this view is not universal and that among the more progressive employers a gradual shift in point of view has been taking place for many years, so that today the vesting in employes of retirement equities established by employer contributions is not uncommon with respect to employes who have been in service for a number of years.

The social security plan takes no account of particular employers except to require that they pay and collect taxes. Whatever rights the worker has are independent of whom his employer may be so long as the employment is covered by the Act. Credits to an individual who earns $2,400 in a year are the same if only one employer is involved as if a dozen are involved. By the same token, the social security plan results in coverage of all employment of covered types without any volition on the part of the employer and quite regardless of the strength or weakness of the employer's financial position. The objective of the social security plan is not at all to solve the employer's problem of retiring superannuated workers; on the contrary it centers attention on the workers to the exclusion of their employer and without regard to any effect on him or his business. It provides for the payment of certain modest benefits, even though it is obvious in many cases that they will never be earned by contributions of or for the individual who receives them.

Thus, through national legislation, we have accomplished with-

out delay what seemed hopeless through efforts of private employers: widespread provision of retirement income that bridges gaps in employment and repeated shifts from one employment to another within a very broad field of coverage.

No exposition of the provisions of the Social Security Act is here intended. This legislation is very comprehensive and even the Old-Age and Survivors Insurance sections include far more than has been mentioned here. The writer's present interest in the Act centers only in its provisions for retirement benefits and the effect that these may have on similar planning where employer-employe relationships are involved. It is, as yet, too soon to tell what this effect will be, but evidence to date indicates an increase rather than a decrease of interest in arranging socially acceptable methods of parting with superannuated employes.

But this is not all. It seems probable that the Federal provision of non-cashable and, for large numbers, non-forfeitable pension equities has broadened the point of view of many employers on this point. Not so long ago many employers contended not only that they could not afford to help finance retirement benefits for persons who left them possibly to go to competitors, but that a major objective of their retirement plans was to keep employes from leaving them; and the way to accomplish this purpose was to allow contingent pension benefits to accumulate to such an extent that the employe could not afford to sacrifice them by withdrawing from service. A high turn-over of employes is probably as expensive as ever, but a number of principles are emerging that have not been widely accepted heretofore. Among these are the following:—

(1) A pension accrual that disappears upon withdrawal from service has much more holding power for less valuable than for more valuable employes. Over a period of years the effect is to lower the general level of employes' ability and virility.

(2) A pension accrual that is retained upon withdrawal from service is far more of a drawing card for promising employe material than is one that disappears upon withdrawal.

(3) When an employe desires to make a change in employment or employer it is poor policy to hold him by means of a pension right that he cannot carry with him. He is in grave danger of becoming a case of arrested development.

(4) Pension rights that are transferable will decrease turn-over in the ranks of the better workers because they will recognize that their accrual of pension rights will free them from a handicap that they would otherwise have in seeking other employment at fairly advanced age. Not only are they free to go; they are also free to stay.

While colleges and universities have recognized these principles for twenty years, it seems likely that the Social Security Act and the discussion of its benefit provisions have done much to hasten their acceptance by other employers.

ABSTRACT OF THE DISCUSSION OF PAPERS READ AT THE PREVIOUS MEETING

FEDERAL *VS.* STATE SUPERVISION OF INSURANCE

RAINARD B. ROBBINS

VOL. XXV, PAGE 313

WRITTEN DISCUSSION

MR. ERNEST R. BERKELEY:

Mr. Robbins' paper is a very welcome addition to the *Proceedings* of the Society because it gathers together in one place and presents in a logical manner numerous scattered facts connected with the development of state supervision of the insurance business and the agitation for Federal supervision, beginning about 1850 and running up through recent times. It is particularly interesting at this time on account of the attempts of the Federal government, in the past few years, to bring under its control many types of business enterprises.

Mr. Robbins points out that in many states the principal interest of the insurance department in the insurance business has been the collection of taxes. On the other hand, the necessity of supervision over the companies for the protection of the insuring public was recognized as long ago as 1858 by Elizur Wright who was one of the two commissioners of insurance appointed in that year in the State of Massachusetts. He felt that policyholders should be able to rely on the promises made in their policies and he did everything possible to bring this about. It is very likely that this opinion was responsible for his favorable stand on nationalizing insurance in 1865. There followed a growth in sentiment for Federal supervision among state insurance commissioners, legislators and company executives which reached a peak between 1900 and 1910. Its decline since that time has been due to adverse court decisions, the fear that Federal supervision would not replace state supervision but would probably be added to it, and doubt concerning the character of National control.

I had hoped that Mr. Robbins would comment on the Congressional investigation of life insurance which began in February, 1939, but probably his paper was completed before that time. This

inquiry resulted from President Roosevelt's message to Congress in which he said, in part, that "the tremendous investment funds controlled by our great insurance companies have certain kinship to investment trusts in that these companies invest as trustees the savings of millions of our people. The S.E.C. should be authorized to make an investigation of the facts relating to these investments with particular relation to their use as an instrument of economic power."

The Temporary National Economic Committee, better known possibly as the anti-monopoly committee, was charged with this undertaking under the chairmanship of Senator O'Mahoney. Many executives of life insurance companies have been questioned and many phases of the business examined. Public hearings were concluded in June, 1939 and a preliminary report was made to the President in July without any recommendations. The investigation is still proceeding in connection with certain specific problems.

At one time during the proceedings Chairman O'Mahoney said that "nothing has been presented to the Committee or the S.E.C. which should give any policyholder the slightest concern and the Committee feels that life insurance assets are such as to indicate that policies are well based." At another time, however, the Chairman raised the question as to "whether it would not be better for policyholders and insurance companies if we had one national system to handle what is obviously a national business."

The implication in these remarks is brought out clearly by Mr. F. H. Ecker, Chairman of the Board of the Metropolitan Life Insurance Company, who has remarked that since the investigators have repeatedly emphasized the soundness of life insurance, the only inference that can be drawn is that the Federal inquiry is aimed not so much at determining whether the business is functioning in the public interest, but at bringing about some form of Federal control or supervision.

The opinion of one insurance commissioner on this point is expressed in an address made before the Association of Life Insurance Presidents in the latter part of 1938 by the Hon. Frank N. Julian, Insurance Superintendent of Alabama and President of the National Association of Insurance Commissioners, who advocated the continuance of the present system of state supervision and deplored the possibility of Federal control with its

multiplicity of rules, regulations, civil service employees and unexpected interference.

The latest development in this situation, and one which affects the casualty business directly as well as all other insurance interests, is the implied threat of Federal supervision in the questionnaire which has just been sent out by the S.E.C. to all insurance commissioners asking for information on the statutory requirements for eligibility to the office of commissioner, business experience before and after commissionership, methods of conducting examinations, etc.

The final result of this investigation is not yet in sight but unless there is repudiation of the principle that insurance is not commerce, which supports the decision in the case of Paul *vs.* Virginia and subsequent decisions of a similar nature, it seems fairly certain that the various states will continue to exercise substantial control over the insurance business for some time to come.

Probably very few of us object to the general principle of regulation and supervision. Differences of opinion occur chiefly in connection with the nature and scope of these functions and their effect on the ability of companies to continue doing business and make a reasonable profit.

There appears to be little justification for Federal supervision. Certainly state supervision has been successful enough if one may judge by the events of the past, and as to the companies, it must be admitted that they have furnished invaluable protection to millions of policyholders and have saved many lives and much property through accident prevention work.

In conclusion, it is quite clear that the prevalent opposition to Federal regulation is based on the fear that the insurance business would suffer the same fate as other businesses over which the Federal government has recently gained regulatory control.

MR. RUSSELL O. HOOKER:

In his timely paper Dr. Robbins has given us an admirable analysis of the legal foundation underlying state supervision, and there would appear to be little of value which one could add along the same line. I would like, therefore, to confine this discussion

to a few observations regarding the functioning of state supervision, with particular reference to its role in our democratic philosophy of government.

Probably the most potent factor in shaping the characteristics of state supervision in recent years has been the National Association of Insurance Commissioners. This Association, representing all sections and voicing all local viewpoints, has nevertheless made remarkable progress toward uniformity of supervision. As a result it can be said that the supervision of insurance operates today on a national scope and yet remains thoroughly in touch with local problems and conditions.

The Committee on Blanks of the National Association of Insurance Commissioners, which the author briefly mentions, is an excellent example of the manner in which that organization combines many viewpoints to obtain an effective solution to important problems. This Committee is truly national in scope and any state can obtain representation thereon. The suggestions made for changes in the various Convention blanks are published on agenda before each meeting for the benefit of all interested parties, and are considered strictly on their merits regardless of source. Many company men attend the meetings and their views on each suggested change are duly weighed by the Committee in making its decision. Each year the Committee presents its report for action by the Executive Committee of the N.A.I.C. and the changes adopted are duly reflected in the Convention annual statements returnable to the various states as of the end of that year. This procedure has resulted in remarkable uniformity of requirements as between the states, and in the constant modernization and improvement of the blanks in conformity with the changing trends and practices of the business. That a committee of this sort could only function under state supervision will, I think, be taken for granted.

Federal supervision would mean a highly centralized form of insurance regulation. We know what centralization has done to business in the last several years. If state supervision were not effective, a good argument might be advanced for trying federal supervision, but state supervision has been remarkably effective. The fact that so few insurance companies failed during the depression speaks volumes for state supervision. Centralized super-

vision of the national banks did not prevent many national banks from closing. If it be argued that federal supervision would make for uniformity of regulation, the answer could be made that state supervision is becoming more and more uniform as between the states each year, due to the operation of the National Association of Insurance Commissioners. If in the past the requirements and standards of some states left something to be desired, this situation is being rapidly corrected through co-operation on examinations and greater uniformity in laws and regulations.

State supervision is the democratic and American way. It represents one of the few rights that the states still possess. It is democratic somewhat in the sense of the town meeting of New England tradition. The towns are excellently managed under the town meeting system, and the average citizen of a New England town would fight fiercely for its retention. It might be argued that centralization of government would be helpful to the town, in that less time would be required than is consumed by the town meeting method of carrying on the town's affairs, but one has only to recall the recent scandals involving some of the larger communities, where control of the public business was centralized in the hands of a relatively small number of persons, to become convinced that centralization of government, while impressive in theory, does not always work for the public good.

State supervision has successfully met the pragmatic test, to use the author's phrase. Under it the rapidly expanding and ramifying business of insurance has been wisely supervised and kept financially sound through periods of prosperity and depression alike. While it may lack the elegance of the streamlined structure which some fertile minds have conjured up to replace it, yet its record of accomplishment points to the logical conclusion that it should be retained and perfected rather than scrapped in favor of an unknown quantity.

MISS EMMA C. MAYCRINK:

This Society and all who are interested in the business of insurance are indebted to Mr. Robbins for his timely paper on the subject of Federal *vs.* State Supervision of Insurance. He has given a resumé of legal decisions which have interpreted the

Constitution beginning with the decision of Paul *vs.* Virginia that insurance is not commerce and therefore Congress under Sec. 8 of Article 1 of the Constitution of the United States has not been given the power to regulate the business of insurance and in the absence of such express power the States are left free to regulate insurance.

Mr. Robbins says . . . "if there is anything *judicially* certain in our ever changing business life it is the dictum of Mr. Justice Field in Paul *vs.* Virginia that, strange as it may seem, *insurance is not commerce.*"

In contrast to the solidarity evidenced by the court decisions, the opinions of prominent men some of which Mr. Robbins has quoted show that these men and the companies they represent have been at variance with the courts, with each other, and finally with their previously expressed ideas.

It will be of interest to students of insurance and in fact of government to read the references Mr. Robbins has given and also the ideas published in more recent times noting chronologically the gradual change in the trend of thought from demands for federal supervision, then away from it, and perhaps in present times back to playing with the idea of federal supervision as a panacea for the ills of state supervision.

Briefly, the burdens mentioned by the protagonists of federal supervision appear to have been taxation, interference with the companies' business and conflict of the various state laws and state regulation. The burdens of taxation persist and have grown more burdensome but this is true of other kinds of business whether supervised by the States or the Federal Government. The question of taxation merits a paper on that subject alone.

Mr. Robbins has quoted principally from the life insurance field. Other classes of insurance were also voicing protests. Mr. Henry E. Hess, manager of the New York Fire Insurance Exchange in an address in 1904 before the International Congress of Arts and Sciences spoke of the "shameful burdens of local taxes, forced loans, examinations, deposits and licenses, legislative subsidies, compulsory advertising and state, county and municipal fees." He said that while the ostensible purpose of the creation of insurance departments is claimed to be the protection of policyholders, state supervision is but a device for taxation and only a small

part of the sum collected has any relation to proving the solvency of companies. Mr. Hess advocated the establishment of a national insurance department for companies doing an interstate business and adds the somewhat naïve thought that it would not be necessary that every insurance company be required to join but might place themselves under such supervision if they chose to do so.

In 1906, there was a model law drafted for the District of Columbia with general provisions for casualty companies. The executive committee of the Board of Casualty & Surety Underwriters sponsored these laws.

The American Life Convention at an organization meeting at Chicago in 1905 went on record in the following resolution, ". . . We are opposed to any interference with state supervision and control of life insurance companies that federal supervision is not expedient and we believe unconstitutional and under present conditions we are opposed to it, we endorse strict state supervision."

It is evident that the tide had turned. What had happened in the interim? Mr. Robbins has mentioned the National Convention of Insurance Commissioners and its influence upon legislation. We are all familiar with the work of this organization which has stood for uniform accounting and reports of insurance companies, uniform valuation of securities and in the past the examination of companies by home States with only occasional joint examinations.

In addition to the work of National Convention of Insurance Commissioners, the companies themselves organized numerous associations and bureaus for each class of business. All of these organizations worked towards uniformity in laws, rating methods, acquisition costs and the other multifarious phases of the insurance business. The interchange of ideas and not always harmonious deliberations served to bring about at least working agreements between the companies and the supervising authorities of the different States. If we consult the record of growth, all lines of insurance increased tremendously during this period.

Coming down to the present, the views expressed upon this controversial topic may be read in our insurance publications. In 1935 the Weekly Underwriter commented upon reports from

Washington that it is proposed to bring insurance companies under the domination of the Federal Government. It says that insurance needs no apologies and is not on the defensive and refers to the record of performance during the time that the banks on the Federal Reserve System closed their doors. Another publication, the Insurance Index, says that federal supervision merely places an additional burden on the companies and is unnecessary and not wanted. It is regarded as an expensive superfluity. It would seem that the dire prophecies of the Jeremiahs of the earlier years have not been fulfilled.

Today the Federal Government is interested in insurance. Investment portfolios of the companies are being scanned. Questionnaires are being sent out which are formidable documents to read much less to answer.

The various compulsory social security enactments of old age security, unemployment and health would indicate that there is a possibility of the Federal Government not only taking a hand in supervising but actually taking over a large part of the business heretofore provided by the insurance companies.

In view of such activity, one can hardly agree with Mr. Robbins that "there is no well defined interest in federal supervision, there is no hope of avoiding state supervision, there is no hope of limiting the freedom of each State to tax the business as it sees fit."

The Journal of Commerce about a year ago in an editorial entitled "Inviting Federal Supervision" commented upon the subject. The tax question was referred to as burdensome and it said . . . "the demands of insurance commissioners of many States that examinations of insurance companies be made by representatives of groups of States, instead of by the State of domicile when no real question of solvency is involved are creating discord among commissioners and great dissatisfaction among companies.

The group examinations system involves a marked increase in the cost of examinations. This tendency of the States unnecessarily to burden and annoy insurance companies and, for the benefit of the favored few, add to the expense which insurance has to pay for protection, is causing the companies to think seriously of the advantages of federal supervision."

Can it be that the cycle is complete and after almost a century of progress in insurance the irritations of taxes with conflicting

and retaliatory regulation are returning and once more will be heard the complaints of "unintelligent and oppressive supervision"?

AUTHOR'S REVIEW OF DISCUSSIONS

MR. RAINARD B. ROBBINS:

Unfortunately for unbiased discussion, interest in this subject has usually been either almost nil or intense. Certainly it cannot be considered to advantage in vacuo. When this paper was originally prepared little interest in the subject was in evidence, and yet, as Miss Maycrink points out, in the face of the present activity of federal agents my statement that "there is no well defined interest in federal supervision" is open to question. The authors of all three of the discussions of this paper show clearly their disapproval of federal supervision. These views are in harmony with all that the writer has seen expressed in insurance periodicals by others in the insurance business. The insurance business seems to be united today in the conviction that Federal supervision should be avoided.

Defects in state supervision are recognized, but much credit is given to the National Association of Insurance Commissioners for its efforts to bring about uniformity by mutual consent through compromise from all. Without doubt the N.A.I.C. has done much during the seventy years of its existence, but the fact remains that difficulties which it has not yet been able to eliminate and which flare up somewhat periodically to the chagrin of ardent advocates of state supervision may prove to be valuable ammunition for those who contend that supervision should be national. Unfortunately it must be admitted that insurance supervision is seriously defective in some states and that undesirable corporations have at times been operated nationally from such a state of domicile to the detriment of citizens of various states. This is a point at which state supervision is vulnerable and its critics capitalize on this defect, even though they can only surmise that federal supervision would correct it.

The popularity of federal supervision shortly before the Armstrong investigation was a protest against some characteristics of state supervision that were causing trouble at that time. The

intense opposition to federal supervision that is so frequently expressed today seems to reflect at once a clear-cut opposition to some of the tendencies toward nationalism that are so evident in this country today and a fear that, unless strenuously opposed, these tendencies may prove to be distinctly harmful to the insurance business and the insuring public. If this new nationalism had the wholehearted support of those carrying large responsibilities in our capitalistic society the defects of state supervision of insurance might loom larger than the fear of federal interference, but experiences of the past few years have left business organizations in no mood to encourage the extension of federal control. The discussions of this paper give evidence of an unnamed dread that "makes us rather bear those ills we have than fly to others that we know not of."

If there is any one lesson that the insurance business should have learned from its experiences in recent years, and likewise from its experiences in the years before the Armstrong investigation, it is that frank, severe, and continual self-examination is the best safeguard against any just criticism from others. Too often the insurance business has suffered from its own success. Prosperity has blinded company officials and supervisory officials to fundamental weaknesses in business methods. Witness, for instance, the union of title and mortgage guarantees. Long-continued success in periods of prosperity, with corresponding growth of salaries for company officials, has, at times, quite unintentionally, intimidated state supervisory officials. Men have come to feel that they have vested interests in methods of conducting the insurance business on the ground that their efforts have developed the business. Humility has its virtues in corporate dealings as well as in the private lives of individuals.

The insurance business has developed to serve the insuring public. Just so long as this is kept in mind, and no longer, can the business prosper in comfort. This attitude must be evidenced by works,—not by lip service. The needs of the insuring public are ever-changing. Insurance service must change with these changing needs, and he is bold indeed—and perhaps very short-sighted—who undertakes to tell the insuring public that the insurance business shall follow only orthodox patterns. Forms of insurance organizations, methods of soliciting business, the degree

of self-insurance, the groupings of insurers—all these refuse to remain static; and the insurance organizations that resist this constant evolution are bound to be overcome in the long run, and in the meantime they constitute a heavy load in public relations that must be carried by the more public-spirited elements in the business.

The slogan of our sales psychology is "Be a booster." Stretch the truth if necessary to be complimentary, but if you can't be optimistic, be still. There was no room for a critic in our prosperous days, and the insurance supervisor whose sense of duty tempted him to question the wisdom of officials with salaries ten times his own usually found another job. The attitude of candid self-examination would welcome the devil's advocate and pay attention to his suggestions. This applies to supervisory officials as well as to company officials, and if this self-inspection were well established, it would probably be the best safeguard against occasional suggestions of cataclysmic changes. The method of trial and error on a small scale has much to recommend it, and surely many of our recent experiences in nationalism should convince us of the wisdom of building the old onto the new rather than razing the old to build in patterns beyond our experience.

STATE MONOPOLY OF COMPENSATION INSURANCE, LABORATORY TEST OF GOVERNMENT IN BUSINESS

PART II

ANALYSIS OF THE RECENT ACTUARIAL AUDIT OF THE OHIO STATE INSURANCE FUND

WINFIELD W. GREENE

VOLUME XXVI, PAGE 130

WRITTEN DISCUSSION

MR. RICHARD FONDILLER*:

In 1936 Mr. Greene made certain comparisons as to the experience by industry groups, between the States of Ohio, New York,

* EDITORIAL NOTE: The Discussions of this Paper appear in the same issue as the Paper itself by request of the members interested.

New Jersey and Massachusetts. He has seen fit to continue his attack on the monopolistic state funds. As far as I am concerned he can attack anything he wants to in the world, even tilt at windmills, as did a famous Don of old. When, however, he attacks the Ohio State Insurance Fund, and on the basis of my surveys and audits, the matter comes closer to home. He is directly and indirectly questioning the soundness of audits and surveys prepared by me in a professional capacity. It is therefore incumbent upon me to make a fitting reply, even if in doing so, I must respectfully point out serious fallacies in Mr. Greene's reasoning, which result in invalidating his conclusions.

Mr. Greene states that I show "no less than five different figures relating to claims incurred for the period 1933-1937 for the Private Fund." The figures referred to are as follows:

Amount	Table No.	Page No.
$52,014,000	18	43
52,124,000	8	23
58,144,000	8	23
73,817,882	9	26
74,825,215	19	45

Mr. Greene continues by saying "It must be admitted that the above figures represent a wide area of choice, ranging from the figure of $52,014,000 appearing in Table 18, to that of $74,825,215 which appears in the very next table, namely, Table 19." He goes on to say "I am going to lean very heavily on the figure of $73,817,882 because this figure appears twice, once in Table 9 and again in the Comparative Statement of Gain and Loss."

The implication that each of the foregoing figures represents the same incurred claims must naturally lead the reader to conclude that there must be something radically wrong with my report. It is unfortunate that Mr. Greene has seen fit to conclude that all these figures relate to the same thing, especially so since each of the Tables referred to carries an appropriate heading.

In order to clear the air of misunderstanding, the following is an explanation of each of the figures:

$52,014,000—Table 18—Page 43

In this table there is shown, by manual classification, the incurred cost of non-catastrophe claims, less interest earned, for

accidents *occurring during the years 1933 to 1937 inclusive.* By "incurred cost" is meant the total amount paid in cash, plus the present value (as of December 31, 1937) of outstanding claims of this same period.

$52,124,000—Table 8—Page 23

This table shows the development of incurred losses *including catastrophe* (claims paid plus present value of unpaid claims). As in the case of Table 18, the accumulated earned interest has been deducted from the incurred cost. It will be seen that the incurred cost of each year is shown by its valuation as of December 31, 1937. The total of $52,124,000, which represents the incurred claims for the years *1933 to 1937 inclusive* is arrived at as follows:

Accident Year	Claims Incurred	Valuation Year
1933	$ 7,401,000	5th
1934	8,910,000	4th
1935	9,516,000	3rd
1936	11,598,000	2nd
1937	14,699,000	1st
	$52,124,000	

This amount also includes catastrophe losses of $401,000, while the item of $52,014,000 in Table 18 excludes catastrophe losses, as indicated. In Table 18, however, there is included in the losses the amount of $289,000 for loss adjustment items not included in Table 8.

The compilation for Table 8 was made from a source independent of that used for Table 18. The purpose of the compilation of Table 8 was to determine the trend in successive valuations, as an indication of the adequacy of reserves established over the various years. In preparing the data for Table 8, subsequent miscellaneous adjustments were not available at the time of the compilation. Table 18 carries all adjustments made subsequent to the compilation of Table 8. The analysis of the two amounts in question, is as follows:

	Valuation as of Dec. 31, 1937	Classification Experience
Non-Catastrophe	$51,725,000	$51,725,000
Adjustment Items	—	289,000
Total Non-Catastrophe.	51,725,000	(B) 52,014,000
Catastrophe	401,000	401,000
	(A) $52,126,000	$52,415,000

(A) = Table 8: Note difference of $2,000 is caused by rounding the figures to the nearest thousand.
(B) = Table 18.

$58,144,000—Table 8—Page 23

This total is not shown in my report. However, the figure is created by Mr. Greene through inflating data for the five year period 1933-1937 to the extent of $6,020,000 by using data of other years back to 1929, as follows:

CLAIMS INCURRED

Accident Year	Dec. 31, 1932	Valution Year	Dec. 31, 1937	Valuation Year
1928	$14,603,000	5th	$15,917,000	10th
1929	17,769,000	4th	19,590,000	9th
1930	15,874,000	3rd	17,339,000	8th
1931	13,045,000	2nd	13,832,000	7th
1932	8,884,000	1st	9,517,000	6th
Totals	$70,175,000		$76,195,000	
			70,175,000	
Increase during 1933-1937 for Five Year Period 1928-1932.....			$ 6,020,000	
Incurred claims of Five Year Period 1933-1937			52,124,000	
Incurred loss for Five Year Period 1933-1937 (Per Mr. Greene).....			$58,144,000	

What Mr. Greene has done here is to add to the incurred cost of claims of the five year period 1933-1937, the increase during the period in the incurred cost of claims for the accidents of 1928 to 1932. This is another of what Mr. Greene chooses to call the "multiplicity of varying figures apparently relating to the same item . . .," but this is an item of Mr. Greene's own creation.

$73,817,882—Table 9—Page 26

This amount represents the incurred cost which was carried into the gain and loss statement for the accounting period January 1, 1933 to December 31, 1937. The figure is arrived at, as follows:

Claims paid (for all accident years) during 1933-1937		$ 64,731,382
Plus: Reserve for Unpaid Claims Dec. 31, 1937.....		47,893,275
		$112,624,657
Less: Reserve for Unpaid Claims—per Ohio Fund Statement as of Dec. 31, 1932.....	$37,799,442	
Add: Adjustment in Reserve for Unpaid Claims as of Dec. 31, 1932	1,007,333 (A)	
Adjusted Reserve for Unpaid Claims—Dec. 31, 1932..		$ 38,806,775
Incurred Cost of Claims—for period of Jan. 1, 1933 to Dec. 31, 1937.....		$ 73,817,882

(A) This amount was added to the Reserve for Unpaid Claims as of December 31, 1932 by Miles M. Dawson in his report on the Actuarial Audit of the Ohio State Insurance Fund, dated July 25, 1933. While this increase affects the incurred claims prior to January 1, 1933, it was necessary (in order to reflect this adjustment in the gain and loss statement) to make this change in the figures of 1932.

$74,825,215—Table 19—Page 45

This figure, which is $1,007,333 (the addition made by Miles M. Dawson) greater than that shown in Table 9, is the incurred cost of claims for the five year period ended December 31, 1937. Since this addition refers to the period prior to January 1, 1933, the *actual* incurred cost of claims for the five year period ended December 31, 1937 totalled to the amount of $73,817,882 as shown in Table 9.

The foregoing figures can be summarized as follows:

A Incurred cost for claims originating in 1933-1937		$52,124,000
B Incurred cost for claims as above..	$52,124,000	
Plus increase for claims 1928-1932.	6,020,000	58,144,000
C Incurred cost of claims originating Jan. 1, 1933 through Dec. 31, 1937 plus developments on claims occurring in *all* prior years.....		73,817,882

Mr. Greene's paper shows numerous other amounts dealing with claims which I will refrain from discussing, since his ultimate conclusion, as regards the solvency of the Ohio State Insurance Fund, has been based on the figures shown in Table 8—

"Development of Incurred Losses by Successive Valuations." From these figures and the results of the application of an elaborate formula Mr. Greene finds that, as of December 31, 1937, the deficiency in reserves for accident years 1928 to 1937 totalled $10,724,820; and, since, according to my valuation the Fund's surplus amounted to $4,340,435, he concludes "if the Private Fund were to liquidate, somebody, the employers or the State of Ohio, presumably, would have to make a contribution of more than $6,000,000."

In my report I stated "the solvency of the Fund is unquestionable; the margin of safety of the statutory surplus is 6.4%; that of the general surplus is 2.1%; and thus the total margin of safety is 8.5% . . ." Mr. Greene and I have both used the same basic figures to arrive at our conclusions. Obviously we can't both be right. Fortunately for the "employers or the State of Ohio" Mr. Greene has erred and I proceed to explain the cause of his error.

In my report, on page 22, I stated as follows: "The estimated reserve for calendar years 1929 to 1935 inclusive, was insufficient for each year, ranging from $124,000 for the year 1929 to $1,429,000 for the year 1930. The necessity for increasing claim reserves for the years 1929 to 1935 inclusive, is due to a number of adverse factors. . . ." From the foregoing it is obvious that I was cognizant of the fact that there *had been* deficiencies in claim reserves. Being aware of this fact, it must naturally follow that, I could not certify to adequacy of the reserves as of December 31, 1937, unless I had previously ascertained that these deficiencies had been provided for and that the current claims were *reserved for on a proper basis.*

Mr. Greene's formula for determining the amount of deficiency is meaningless because it ignores the fact that the reserve bases used at December 31, 1937 were adequate and that all deficits occasioned by the use of inadequate bases in the past had been made good.

As of December 31, 1937, the claim reserves for both deaths and permanent totals were strengthened by the use of 3.5% interest instead of 4%, on all claims where the accident occurred prior to January 1, 1936. As of the same date, the reserves for accidents of the calendar years 1936 and 1937 were valued upon the con-

servative basis of 3%. In my report, on page 15, Table 4 shows that the ultimate yield of *all* bonds was 3.44%. (It should be remembered that death claims and permanent totals, which are the only claim reserves which are required to earn interest to maintain the reserve, constitute about *one-half* of the total reserve.)

Unfortunately, Mr. Greene overlooked my intimation that the reserve basis had been strengthened. This was pointed out on page 20 under the discussion of the death claim reserve, which states "Those reserves which were calculated on the 4% table were, in the final analysis, adjusted to a 3.5% basis."

Mr. Greene has made the serious mistake of incorrectly developing reserves. Knowing him as I do, I would state that I believe sincerely that this was done in error rather than deliberately. I will briefly describe the method used by him and then point out the fallacy.

Mr. Greene takes the incurred losses as of the tenth annual valuation as final. The first valuation is at the end of the calendar year in which the accident occurred and successive valuations are made annually thereafter. Again I want to make clear the definition of "incurred losses." Incurred losses for any given period, at any specific time of valuation, are equal to the sum of the paid losses and the present value of future payments less the interest earned on incurred losses. Thus the incurred losses at the first valuation represent the sum of the losses paid on accidents for that year plus the *present* value of future payments. The second valuation represents the losses paid during the first year plus the losses paid during the second year plus the *present* value of future payments and so on for all subsequent periods.

Using the figures for incurred losses at each successive valuation date, Mr. Greene obtains development ratios, that is the ratio of losses as of the 10th valuation to those of the 9th; the ratio of the losses as of the 9th to the 8th and so on. Since Mr. Greene uses the ten year period 1928-1937 he is able to obtain five year average development ratios for the 1st, 2nd, 3rd, 4th and 5th valuations and 4, 3, 2 and 1 year averages for the 6th, 7th, 8th, and 9th valuations respectively, the tenth valuation being taken as final. By accumulating factors he develops figures to place the incurred losses for the first valuation on a tenth valuation

basis, the second on a tenth, etc. He then applies these factors to the incurred losses as of December 31, 1937, obtaining losses for *all* years on a tenth valuation basis. The difference between his incurred losses on a tenth valuation basis and the incurred loss of the Ohio Fund as of December 31, 1937, represents the so-called deficiency which Mr. Greene creates as of December 31, 1937. For the latest five years 1933-1937, Mr. Greene says the deficiency is $7,685,000; similarly for the latest ten years 1928-1937 he says the deficiency is $10,765,000.

The procedure for determining reserves which Mr. Greene has followed is quite fallacious, in that he has entirely overlooked the fact that incurred losses must normally increase from one valuation date to the next because of the placing of unpaid losses on a present value basis, and adding the paid losses to obtain total incurred losses. Surely Mr. Greene must be aware of the phenomenon of consistently increasing incurred losses from one valuation date until the next. He is probably aware of the special call issued in March, 1939 by the Actuarial Committee of the New York Compensation Insurance Rating Board to determine the accretions which result from successive revaluations of cases. He is also probably aware of the action in March 1939 of the Actuarial Committee of that Board eliminating $8,486,502 which was the increase in incurred losses estimated as due to revaluation of cases, plus $657,916 for interest on reserve developments, thus transforming an accumulated underwriting loss of $5,956,950 for the calendar years 1933-1938 to a profit of $3,187,468. He is also probably aware of the action of the Superintendent of Insurance of New York approving this adjustment and also approving the July 1, 1939 rates based on this procedure.

There is available for those interested in the matter an able explanation of the whole procedure by Mr. James M. Cahill, Actuary of the New York Compensation Insurance Rating Board, which is contained in this number of the *Proceedings*.

Mr. Cahill's paper is entitled "Contingency Loading—New York Workmen's Compensation Insurance." I am going to take the liberty of reproducing Mr. Cahill's explanation of the manner in which incurred losses develop from year to year due solely to the effect of adding the present value of future payments to the previously paid losses. (It should be understood that the

table below is merely illustrative, because it deals only with a single life. The important part which mortality plays cannot be readily shown with a single life). Mr. Cahill's Table 4 follows:

ILLUSTRATION OF DEVELOPMENT OF INCURRED COMPENSATION LOSS FOR A PERMANENT TOTAL CLAIM

Assumptions: (1) July 1, 1934 date of accident in policy year 1934.
(2) $30 weekly wages; $20 weekly compensation benefit.
(3) Date of birth December 31, 1894.

Valuation Date	No. of Months Development of Policy Year	Compensation Loss			Increase in Incurred Loss	3.5% × Mean o/s Loss Reserve
		Paid	o/s	Incurred (3) + (4)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
12-31-34	12	$ 520	$19,058	$19,578	..	..
12-31-35	24	1,560	18,797	20,357	$779	..
12-31-36	36	2,600	18,530	21,130	773	..
12-31-37	48	3,640	18,254	21,894	764	..
12-31-38	60	4,680	17,971	22,651	757	..
12-31-39	72	5,720	17,680	23,400	749	$624
12-31-40	84	6,760	17,383	24,143	743	614
12-31-41	96	7,800	17,077	24,877	734	603
12-31-42	108	8,840	16,764	25,604	727	592
12-31-43	120	9,880	16,443	26,323	719	581

It will be seen that the development of this claim is followed through 10 successive valuation dates, a period identical with that used by Mr. Greene. It can be further seen that the incurred loss on the first valuation date is $19,578 and on the tenth it is $26,323. Following Mr. Greene's line of reasoning, he would say that, since as of the tenth valuation date the incurred loss is $26,323 and on the first valuation date the incurred loss is $19,578, the reserve must be impaired $6,745 on this particular claim. Expressing it somewhat differently, Mr. Greene's argument amounts to this; since incurred losses include present values of unpaid claims, and since the sum of the actual payments when the claims are paid will exceed these present values, then these reserves must be deficient.

Applying Mr. Greene's argument to life insurance, we would arrive at the absurd conclusion that the single premium for $1,000 of whole life insurance is $1,000. As easy as all that!

The fallacy is of course obvious. As of any valuation date, the total incurred losses need not be those ultimately incurred,

and reserves need not be maintained so that the paid plus the unpaid should equal those ultimately incurred. It is sufficient to maintain *reserves* on a *present value basis.* Interest and mortality will take care of the rest. In order that an insurance institution may be solvent it must have at any particular moment only such a sum on hand as, with interest accumulations, will ultimately liquidate unpaid claims. It does not have to have on hand at that moment the interest that will be needed, as is implied by Mr. Greene's reasoning. I was satisfied that as of December 31, 1937 the surplus of the Fund over and above the required reserves, properly valued, was $4,340,435.

In a paper delivered in 1936 as a presidential address, Mr. Greene criticized the Ohio Fund and made certain comparisons to show that the compensation cost in Ohio was much higher than it should be. There was no discussion of that paper, since presidential addresses are not commented upon by members. At this time, however, I think it advisable to point out a few flaws in Mr. Greene's procedure which he again uses in the current paper.

To determine whether or not Ohio costs are excessive, Mr. Greene uses the following procedure which the reader can readily follow by reading the text and examining Table V and Table VIII of Mr. Greene's paper.

1. Ohio incurred losses and Ohio payrolls are used to obtain classification pure premiums and average overall pure premiums—Basis I.
2. The same procedure is repeated but Ohio incurred losses are increased 34.7% to adjust for "interest" and "reserve inadequacy." This increase of 34.7% is the one calculated by determining what the incurred losses on a tenth valuation basis should be—Basis II.
3. Payrolls and incurred losses for comparable classes are obtained for New York, New Jersey and Massachusetts. The incurred losses are placed on the level of the benefits in effect in Ohio by means of theoretical factors measuring the difference in benefit cost of the states.
4. Pure premiums on the basis of New York, New Jersey and Massachusetts payrolls and losses (adjusted to the Ohio level) are obtained and compared with the two sets of Ohio pure premiums.
5. Pure premiums on the basis of New York, New Jersey, and Massachusetts data are applied to Ohio payrolls to obtain "Projected Losses" to compare with Ohio losses.

Inasmuch as I have already disclosed the fallacy of Mr. Greene's reasoning with respect to inadequacy of reserves, I believe that it will be sufficient to disregard his Basis II wherein he loads Ohio incurred losses, putting them on a 10th valuation incurred cost basis. However, even if we take Mr. Greene's figure of 38% as the amount by which Ohio losses exceed those of the other states, the figure reduces to 2.5% if we exclude his error of using the factor of 1.347 to place losses on a 10th valuation basis $(1.38 \div 1.347) = 1.025$. But there are a few other points that should be discussed.

If we examine Table V of Mr. Greene's paper for the combined exposure for New York, Massachusetts and New Jersey, we see that "certain classes" with the lowest pure premiums have the greatest exposure, Textiles and Stores. It happens that both of these groups have almost the same pure premiums as those of Ohio. If we exclude these groups, we find that the average pure premium of the groups for which exposure is shown in Part A of Exhibit I changes from 79¢ to $1.61. Similarly, when these "certain classes" are excluded in Part B of Exhibit I, the pure premium changes from 60¢ to $1.51. The details are shown on Exhibit I herein. Obviously, the differences between Ohio and the other states must be due to the presence of a relatively greater proportion of low rated payrolls in New York, Massachusetts and New Jersey. Since the lowest rated groups have practically the same pure premiums, and since the remaining groups also have almost the same pure premium, and the average is materially different, it is evident that we are comparing exposures with quite different distributions of risk.

There is still another way of proving the point. Mr. Greene has taken the pure premiums for New York, New Jersey and Massachusetts and applied them to Ohio payrolls to obtain "projected losses." This indicates that if the New York, New Jersey and Massachusetts pure premiums were in effect in Ohio the equivalent incurred losses would be $28,926,748 (Column 10 of Table V) compared to Ohio incurred losses of $29,561,000 (Column 2 of Table V). The ratio of actual to projected on this basis is 1.022, a figure which corresponds roughly to the 2.5% previously quoted. But we can test this procedure. If we apply the Ohio pure premiums to the payrolls of New York, New Jersey

and Massachusetts, we obtain projected losses of $97,414,695 to compare with incurred of $97,428,087 (Column 7 of Table V) or a ratio of .999, indicating that Ohio pure premiums if applied in New York, New Jersey and Massachusetts would yield practically identical losses.

There is a third test we can apply to Mr. Greene's procedure. The incurred losses for each of the three states have been placed on a common benefit level, that of Ohio. Since the same insurance companies, to a greater or less extent, operate in all three states, and since incurred losses are probably set up on a uniform basis we should expect more or less similarity in pure premiums. But the pure premium indications are as follows:

New York	.86
New Jersey	.83
Massachusetts	.60
These three states combined	.80

Massachusetts appears to have a much lower pure premium than New York. Following Mr. Greene's line of reasoning, we would or could say that compared to Massachusetts, the losses in New York and in New Jersey are 30% higher than the level indicated by Massachusetts experience.

All of the above has been presented to illustrate the fact that comparisons such as Mr. Greene makes are meaningless, unless we examine and make certain that the exposures have *equal* weight.

We must remember that Mr. Greene has excluded all loadings from the losses. In addition to the expense loading which should be included both for Ohio and the other states, he has left out: (1) loadings for off-balance of rating plans, which run in the vicinity of 5% to 10%; (2) contingency factors which prior to this year amounted in New York to 9.2% and now to 4.3%; (3) loadings for special security funds which in New York also amount to 1.2%. These special loadings are required, presumably to make certain of the continued solvency of the insurance carriers. Whatever their need and whatever their uses, these special loadings add to the premium rate and are added charges which the employers must pay.

In concluding his paper, Mr. Greene makes reference to a report entitled "Progress of State Insurance Funds Under Workmen's

EXHIBIT I

PART A

From Table 18 of New Report, Woodward and Fondiller, Inc.
OHIO EXPERIENCE

Group No.	Description	Payroll (hundreds)	Incurred Losses	Pure Premium
14A* & 14B*	Textiles	$ 267,262,0	$ 1,177,000	$ .44
18A* & 18B*	Stores—including clerical classifications	2,087,907,0	6,328,000	.30
Other Classes in groups 1-18 except above groups		1,366,540,0	22,056,000	1.61
Sub-Total groups 1-18		$3,721,709,0	$29,561,000	$ .79

PART B

From Table V of Mr. Greene's Paper
NEW YORK, NEW JERSEY AND MASSACHUSETTS ON OHIO LEVEL

Sched. Nos.	Payroll	Incurred Losses	Pure Premium
06 Textile* & 07 Clothing	$ 2,379,779,7	$10,318,587	$ .43
34 Commercial* & 35 Clerical and Professional*	10,197,601,3	31,477,463	.31
Other schedules except above schedules	3,672,867,7	55,632,037	1.51
Sub-Total	$16,250,248,7	$97,428,087	$ .60

* These groups are designated as "certain classes" in the text.

Compensation—A Quarter Century of American Experience," by John B. Andrews and denounces that report as "the frankest sort of propaganda."

Mr. Greene's introduction of the "propaganda" motive cannot help but cause the reader to wonder whether, in his paper, he has not attempted to battle the propaganda he denounces with still more propaganda, under the guise of scientific demonstration.

I have only a scientific interest in the issues drawn between Mr. Greene and the proponents of monopolistic state funds and have prepared this discussion of his paper solely with a view to establishing that my analyses and valuations of the Ohio State Fund were actuarially sound.

MR. E. I. EVANS*:

Two papers have been presented before the Casualty Actuarial Society by Winfield W. Greene that have severely criticized the Ohio State Insurance Fund.

Mr. Greene in his presidential address before the Society in 1936 first made the record of the Ohio Fund an issue in the controversial subject of state funds *vs.* private companies in the field of workmen's compensation insurance, and at that time invited a discussion by stating that the Society was a strictly non-partisan body and would welcome a rebuttal.

Mr. Greene has found it necessary in his latest paper to attack the technical ability of Mr. Richard Fondiller and his staff, who made the latest actuarial audit of the Fund, in order to establish a color of doubt as to the Fund's financial status, as the record of the Ohio Fund as contained in its latest Actuarial Audit Report does not make it possible to make an unfavorable comparison of Ohio with private carriers. Mr. Fondiller will no doubt cover effectively the involved technical process that Mr. Greene follows in developing hypothetical items from which he endeavors to assume that the financial statement of the Ohio Fund understates its liabilities to the extent of $10,765,000.

As it is apparent that Mr. Greene's paper is for the prime purpose of propaganda against state funds and as Mr. Fondiller will

* EDITORIAL NOTE: Request to discuss Mr. Greene's Paper was made by Mr. Evans and granted by the Council.

not necessarily be concerned in such an issue, it is proper that the Ohio Fund reply to the outburst against it.

The attack is directed against the actuarial technique followed by the administrator of the Ohio Fund, in an endeavor to portray a condition of inadequate reserves, insolvency and abnormally high rates. Having been actuary of the Fund for the past nineteen years I feel it is incumbent upon me to reply and challenge the position taken by Mr. Greene and to point out the fallacy of his conclusions in order that erroneous impressions will not be obtained respecting the Ohio Fund.

I deeply appreciate the consideration of the officers and Council of the Society in granting me the privilege of discussing this paper.

It is only natural that opponents of state funds, particularly exclusive funds, will search enviously for vulnerable points of attack against the Ohio Fund. The accomplishments of the Fund over the twenty-eight years of its existence and its having long become the distributor of more workmen's compensation benefits than any other insurance carrier in the country, has well disproved the many predicted forebodings that would befall an exclusive state fund. While Ohio can easily be proud of its workmen's compensation exclusive state fund, it is not contended that there is no room for further improvement and it is even further recognized that private carriers do have many points of merit.

It has been the policy throughout the history of the Ohio Fund to periodically have comprehensive actuarial audits and administrative surveys by outstanding independent technical actuarial firms in order to obtain constructive advice and criticism on technical and administrative phases of the operation of an efficient workmen's compensation carrier. A substantial measure of credit for the success of the Ohio Fund can be attributed to thorough examinations by such prominent actuaries as E. H. Downey (deceased), Miles M. Dawson and Richard Fondiller. The Actuarial Audit Reports of these men made at various times have always been published and copies generously distributed to the interested public.

Mr. Greene first represents that various public committees and commissions have reported grave lack of efficiency in the operation of the Ohio Fund. The Ohio Fund has always been open to public scrutiny and it has never been admitted that the fund has received

adequate administrative appropriation to perform as efficiently as would be desired. However, it must be remembered in this regard that the administrative cost of the Ohio Fund has averaged less than 7 percent of the benefits distributed, while private carriers provide in their premium rates for an administrative cost of 67 percent of their benefits distributed.

The Ohio Fund has been credited with having furnished compensation insurance at a lower cost than any other plan, thereby benefiting not only employers but also the employees since the saving in the insurance cost becomes potentially available for more liberal benefits. This fact appears to have motivated Mr. Greene to endeavor to establish that the pure premium cost of the Ohio Fund was 38% higher than for a corresponding period, on a comparable law benefit level, for the private insurance company states of New York, New Jersey and Massachusetts.

As this is the second analysis that Mr. Greene has made of the operating record of the Ohio Fund he is confronted with the difficulty of being consistent in his method of comparison of Ohio with the three private company states in his two papers. He states that he is unable to understand why Ohio's pure premium dropped from $1.20 to 91¢ from the five years 1929-1933 to the five years 1933-1937, and immediately reasons that something is wrong with the data producing the 91¢ pure premium rate, and proceeds to endeavor to establish a basis for inflating the 1933-1937 incurred losses to a level equal to that of 1929-1933.

It is well recognized by those who have been in touch with workmen's compensation insurance cost that the effect of the down swing into the depression over the five year period 1929-1933 resulted in severely increasing incurred losses and that the up swing over the five year period 1933-1937 resulted in a decided improvement in loss ratios. Mr. Greene is surely mindful of the fact that several private insurance carriers in the workmen's compensation field met with financial difficulties during the dark days that fell within the five year span, 1929-1933, which resulted in their failure to meet their claim obligations. It is only proper to state at this point, that the Ohio Fund as well as all other state funds, met their claim obligations in full. The inability of injured workers and their families to receive benefits due to financial difficulties of private carriers was of such moment as to occasion the

establishment of special security funds against insolvency of private carriers to provide for unpaid claims of insolvent insurance companies. The necessity of security funds was to alleviate the demand for establishing exclusive state funds in private insurance company states.

The $1.20 Ohio pure premium for 1929-1933 used by Mr. Greene in his first analysis was based upon incurred losses before giving effect to interest earnings allocatable to such losses, while the 91¢ pure premium for 1933-1937 used in his second analysis was on incurred losses after giving effect to interest earnings. The effect of interest earnings reduces the $1.20 pure premium to $1.06. The remaining difference is largely due to lower incurred losses attributable to the improved economic condition of 1933-1937 over 1929-1933 as previously indicated. The high incentive for effective safety brought about by the broad merit rating plan of the Ohio Fund which is extended to apply to employers with premium exposure as low as $200 for a five year period is an important factor in tending to improve loss costs. Also, the Ohio Fund's very aggressive activity in general safety promotion among Ohio employers and workers through a department maintained specifically for the promotion of safety and hygiene in industry results in reducing losses.

Mr. Greene contends that there were five different values contained in Mr. Fondiller's Report for the item of claims incurred. However, four of the values, while appearing in Mr. Fondiller's Report, do not refer to the same particular items and are so designated. One of the values was nowhere to be found in the report of Mr. Fondiller, but was actually created by Mr. Greene through an inflation of $6,020,000 to one of the other four values.

Further on in his paper Mr. Greene indicates that he appreciates the difference in the various values but erroneously contends that there should be no substantial difference in the incurred claims on a calendar year basis than on an accident year basis. It is appreciated that if at all times correct claim reserves are set up at the close of an accident year that there will be no necessity of adjusting earlier claim reserves in subsequent years. However, there is of necessity a continual, from year to year, adjustment of claim reserves of earlier years to a more or less degree; therefore, what may be true in theory is not so in practice. We are all

familiar with the fact that in the workmen's compensation field, insurance institutions were required to rather drastically increase claim reserves for re-opened and abnormally continuing claims attributable to the abnormal depression years. Indeed, Mr. Greene is no doubt familiar with the workmen's compensation experience of his own company as published in Best's Insurance News of July 11, 1938, in which the loss ratio of the 1930 policy year was increased from 84.2% on the second valuation at the end of 1931 to 111.07% on the 8th valuation at the end of 1937. This increase is rather characteristic of the experience of workmen's compensation carriers for the policy years immediately following 1929. In such instance, was the incurred loss reserve for the policy year 1930 properly stated at the end of 1931 and over stated at the end of 1937, or, was it understated at the end of 1931 and adequately stated at the end of 1937? In the light of knowledge available at the respective periods of valuation it is probable that the reserves were conservatively established and it would have been unreasonable to foretell the conditions that were to become potent factors in increasing losses in subsequent years.

The Ohio Fund must use its investment income for the payment of claims, thus reducing the value of incurred claim cost. As there has been an extreme reduction in investment yields in recent years the effect of such yield decline has a greater influence on state fund incurred claim losses than would be the case where investment earnings are not fully credited towards the payment of incurred claim losses. The Ohio Fund has increased the claim reserves from time to time in recent years to properly reflect the declining interest rates on investments of claim reserves. As claim reserves of earlier accident years have been adjusted downward in recent years from 4% to 3½%, it is natural that such adjustment would influence the trend indicated in Mr. Greene's Table III and the effect of which he has failed to recognize, unless he is assuming that the interest yield will continue to decline in a similar ratio for years into the future. This becomes illogical in that we approach an irreducible minimum as a substantial portion of the reserves at the close of 1937 were on a 3% and all others were on a 3½% basis.

In Table III of Mr. Greene's paper he has ignored the underlying basis of the claim reserve valuation established by Mr.

Fondiller at the end of 1937 and has illogically reasoned that because reserves have been strengthened over past years that such a strengthening should be an indication for further augmenting the reserves. In other words, he would have us reason that the more conservative you become the greater is the need for further conservatism in the setting of reserves. If this reasoning is accepted and continued ad infinitum there would be no upper limit. Would it not be as logical to reason that the Fund has been ultra conservative and has over a succession of years unnecessarily inflated the reserves to provide for upper limits of possibilities rather than for reasonable probabilities of future claim cost?

By assuming that the incurred losses were understated by Mr. Fondiller, for the five calendar years of accident, 1933-1937, an inflation of $18,048,858 has been made, raising the incurred losses from $52,014,000 to $70,062,858, or an increase of 34.7% before comparing the Ohio Fund's incurred loss experience with the experience of the private insurance company states of New York, New Jersey and Massachusetts.

We find further that another adjustment has been made which results in reducing the actual incurred losses of the three private insurance company states to the extent of 10% before making the comparison. This reduction is based upon theoretical law differential factors which are generally recognized as not necessarily indicative of the ultimate difference in the benefit levels of different states.

Mr. Greene contends that it is necessary to reduce the actual incurred losses of New York 17% (1.—83%) and increase the actual incurred losses of New Jersey and Massachusetts 1% and 12% respectively to bring the three Eastern states to a level of Ohio. If such is the case it should cause the pure premium of the three states, New York, New Jersey and Massachusetts, to have common pure premium rates. We find, however, the following is the result:

	Experience Pure Premium	Adjustment Factors to Ohio Level	Pure Premium After Adjustment to Ohio Level
Ohio	.91	1.	.91
New York	.86	.83	.7138
New Jersey	.83	1.01	.838
Massachusetts	.60	1.12	.672
N. Y., N. J. and Mass.	.80	.90	.72

The comparison of the actual experience pure premium with the pure premium as adjusted by Mr. Greene to what he contends was the Ohio level discloses very vividly that the pure premiums of the three private insurance company states have not been adjusted to a common level. We find that New Jersey and Massachusetts, which have exclusively private insurance, have widely separated pure premiums, .838 and .672. Does this difference between New Jersey and Massachusetts indicate that New Jersey employers are paying a cost 24% higher than they should and since there is no state fund, to what is the difference attributed? Must we not in fairness conclude that the use of the law differential factors to adjust to Ohio level results only in giving a disadvantage to Ohio of 10% in the comparison of pure premiums.

After having increased the Ohio pure premium 34.7% and decreasing the other three states' pure premium 10%, Mr. Greene is able to develop the 38% higher level for Ohio which he would have us believe represents the handicap to Ohio employers of a state fund. However, the increase of 34.7% and the decrease of 10% should result in a difference of 50%, $(1. + 34.7\%) \div (1.-10.\%) = 1.50$, therefore, we must look for the remaining difference that causes an inserted adjustment advantage of 50% to result in only a net advantage of 38%. It must be that the pure premiums of the three private insurance company states were actually at a higher level than that of Ohio.

Mr. Greene has selected particular groups of industry classifications for making a comparison. This comparison in Table V is a play upon comparing two separate averages of similar items but of unequal weights. The comparative table reflects false ratios unfavorable to Ohio and strongly in favor of New York, New Jersey and Massachusetts, due to the unbalanced experience of low and high hazard industries. It will be observed that for coal mining and quarries, which are very high hazard industries, the Ohio data has twenty times the relative exposure of the other three states while in the textile and clothing industries, which carry very low hazards, Ohio has less than half the relative volume of the other states; also in the case of clerical, commercial and professional groups, with low hazards, Ohio's relative ratio is far below that of the other three states. The comparison of the averages of Ohio with the other three states as developed in

this table is meaningless due to the preponderance of high hazard industries in Ohio data and the preponderance of exposure of low hazard industries in the data of the other three states. It can readily be determined that this off balance of high hazard and low hazard industries gives a disadvantage of 23% to Ohio in the comparison in Mr. Greene's Table V.

We thus find that the 23% developed by Mr. Greene analyzes as follows:

Ohio pure premium	$ .91
Inflating Ohio incurred losses 34.7%	1.23
N. Y., N. J. and Mass. pure premium	.80
Increase for preponderance of light hazard industries in N. Y., N. J. and Mass. 23%	.98
Decrease by law differentials N. Y., N. J. and Mass. 10%	.89
Ohio pure premium above N. Y., N. J. and Mass.	38%

We, therefore, have a situation in which the Ohio pure premium of 91¢ has been compared with pure premium of New York, New Jersey and Massachusetts of 89¢ by inserting various adjustment factors that inflate Ohio and deflate the other states until there is an indicated excessive pure premium of 38% in Ohio.

A comparison of the experience for the classifications used by Mr. Greene after eliminating his inflation of incurred losses for Ohio and his deflation of the incurred losses of the private insurance states would be as follows:

Ohio	Amount	Rate per $100 Payroll
(1) Payroll Greene's Table V	$3,721,709,000	
(2) Incurred losses Greene's Table V	29,561,000	$ .79
(3) Incurred losses loaded for catastrophe and occupational diseases. 1./.97 × line (2)	30,475,258	.82
(4) Ultimate premium after including 1% for safety. 1./.99 × line (3)	30,783,089	.83
N. Y., N. J. and Mass.		
(5) Deflated pure premium rates applied to Ohio payroll Mr. Greene's Table V	28,926,748	.78
(6) Actual pure premium applied to Ohio payroll. 1./.90 × line (5)	32,140,831	.86
(7) Ultimate premium after including administrative expenses. 1./.60 × line (6)	53,568,052	1.44

We thus find that were private insurance stock company carriers operating in Ohio in lieu of the State Fund, the experience

of the three Eastern states indicates that Ohio Employers would pay under private stock company carriers 73.5% higher rates or premiums of $53,568,052 instead of $30,783,089 under the classifications used in his comparison. This is directly the opposite of what Mr. Greene would convey: that Ohio employers would pay 38% higher premium rates under an exclusive state fund plan than under private insurance carriers.

Were we to concede that the deflation of 10% should be made in the pure premium rates of the three private insurance company states it would then mean that Ohio employees and their families would receive 5% less benefits than under the state fund plan and employers would pay premium rates 56.6% higher than at present.

Table I gives a direct comparison of premium cost to employers in the states of Ohio and New York. New York has been used in that it represents over 60% of the total payroll exposure of the three private insurance states used in Mr. Greene's comparison. The published rates of Ohio and New York have been applied to the Ohio payroll of specific classifications to determine the relative premium cost to employers in each state.

Twelve classifications of industries that are generally common to all states and in which the classification descriptions are similar in Ohio and New York have been selected for comparative purposes. In order to eliminate any factor of error due to uneven distribution of payroll within the two states, the published rates of the two states have been applied to the Ohio payroll in developing the premium for each state.

The comparison discloses that the Ohio Fund rates develop premium amounting to $8,402,178, while the premium for the same classifications and payroll at New York rates is $17,511,577; thus, were Ohio employers being insured under the New York plan, their premium cost would be $9,109,399 more than under the Ohio plan. Consequently, the ratio of cost to the employer between the Ohio Fund plan and the New York Private Insurance Plan would be in the ratio of one to two.

Inasmuch as 99% of the premium income of the Ohio Fund is used for the purpose of paying benefits, while the rates of the private insurance companies in New York contemplate only 60% of the premium for losses, the amount of expected losses between the two states is readily determinable. The twelve classifications

under the Ohio Fund rates would provide for losses of $8,318,156, while the losses provided under the New York rates would amount to $10,506,946. This would indicate that the New York rates contemplate 26.31% higher losses than the Ohio rates; however, the 60% allowance in the New York rates for incurred claims includes loss expense of investigators, adjusters, rents, salaries and expense of office employees, home office expense and other expenses under or on account of claims, whether allocated or unallocated to specific claims, while the 99% in the Ohio rates is for benefits only. When allowance is taken for the loss expense that is included with benefits, the additional benefits that employees and their families receive under private insurance New York rates would be substantially below the 26.31% indicated in the table.

Ohio's responsible representatives of labor and employers are not blindly committed to state monopoly as Mr. Greene fears, for they have been kept fully acquainted with the facts as to the twenty-eight years record of the Ohio Fund.

In conclusion, I respectfully but emphatically disagree with the technical procedure and conclusions Mr. Greene presents in his paper. The accomplishments of the Ohio Fund are naturally distasteful to the proponents of private insurance and Mr. Greene in an endeavor to disprove these accomplishments has delved into the realm of conjecture in unnecessarily inflating the Ohio incurred losses, thus invalidating the comparison he presents.

Mr. Fondiller with a competent staff and with access to all records of the Ohio Fund, has made a comprehensive and emphatic statement as to the unquestionable solvency of the Fund.

The futility of scientifically demonstrating that a properly administered workmen's compensation exclusive state fund is not more economical from the standpoint of lower premium cost to employers and more liberal benefits to workers is apparent.

TABLE I

COMPARISON OF OHIO AND NEW YORK WORKMAN'S COMPENSATION
PREMIUM RATES AND PURE PREMIUM
12 Classifications

Classification	OHIO '33-'37 Payroll (000 Omitted)	OHIO Manual	OHIO Rate 7-1-39	OHIO Full Premium	NEW YORK Manual	NEW YORK Rate 7-1-39	NEW YORK Full Premium	New York Excess over Ohio
Bakeries	$ 84,436	2000	$1.20	$1,013,232	2003	$2.72	$ 2,296,659	$1,283,427
Laundries	32,879	2581	1.00	328,790	2581	1.96	644,428	315,638
Shoe Mfgrs.	59,909	2660	.40	239,636	2660	.91	545,172	305,536
Iron Foundries	52,628	3081	2.00	1,052,560	3081	3.13	1,647,256	594,696
Machine Shops	151,347	3632	1.00	1,513,470	3632	2.64	3,995,561	2,482,091
Brick Mfg.	32,004	4029	1.60	512,064	4021	5.40	1,728,216	1,216,152
Str. Steel Erection	2,947	5040	20.00	589,400	5040	48.28	1,422,812	833,412
Elec. Light & Power Co.	21,047	7531	1.80	378,846	7539	3.48	732,436	353,590
Traveling Salesmen	271,624	8747	.40	1,086,496	8742	.50	1,358,120	271,624
Clerical Office	943,063	8810	.05	471,532	8810	.10	943,063	471,531
Hotels	54,724	9050	.80	437,792	9052	1.65	902,946	465,154
Restaurants	70,760	9071	1.10	778,360	9079	1.83	1,294,908	516,548
TOTAL	$1,777,368		.47	$8,402,178		.99	$17,511,577	$9,109,399
% of Ohio				100%			208.42%	
Pure Premium Factor				99%			60%	
Pure Premium				$8,318,156			$10,506,946	
% of Ohio				100%			126.31%	

AUTHOR'S REVIEW OF DISCUSSIONS

MR. WINFIELD W. GREENE:

The subject under discussion is fraught with grave importance not merely to the insurance business but to employers, employees, legislators, and the public generally. Therefore, I think it both fitting and fortunate that Mr. Fondiller and Mr. Evans, both of whom are closely in touch with the operations of the Ohio State Fund, have commented upon my paper.

Just to clear the air, let me say that I am not "attacking" any individuals whatsoever. I am trying to present the facts and their significant implications as I see them and insofar as I can uncover them. There is no doubt that I am attacking the institution of state monopoly of compensation insurance. It may possibly have been "a noble experiment" but I do not believe its further continuance to be a sound thing socially or economically. (Nor do I think well of private monopoly, except it be a natural monopoly subject to effective governmental supervision.)

To the informed and discerning much of what my critics have said is, in my opinion, self-defeating, unsupported, or irrelevant. Therefore, in order to minimize confusion, and conserve the time of the reader, I shall concern myself mainly with a reappraisal of the situation as regards the two major points raised in my paper, confining my direct comments on the above discussion to matters of some real significance.

My first main point had to do with

Adequacy of Reserves

In order to get a proper perspective on this general subject, I would direct attention to Table "A"[1] which shows all the information contained in the new report as to what happened to the Fund's loss reserves during the five calendar years ended with 1937. From this table it appears that with full credit for all interest realized the reserves for accident years 1932 and prior developed

[1] In this table the figures as to the reserves for all accident years prior to 1928 are of necessity lumped together, as Table 8 of the new report begins with accident year 1928. Table "A" is analogous to Table I of my paper but presents, I believe, a clearer and more detailed picture. In Table "A" all figures as to the deficiency of reserves are shown net of interest, whereas in my previous table they were shown before deduction of interest.

a deficiency of $10,755,000 during the said five-year period, and that during the last four years of that period the reserves for accident years 1933 and prior turned out to be deficient to the extent of $11,270,000. Both the figures just stated reflect *only what had actually happened* by December 31, 1937, and include *no allowance whatever for developments expected after that date.* Now the surplus of the private fund at December 31, 1932 as stated in the published reports of the Industrial Commission of Ohio was $115,908. However, the reserve inadequacy on that date exceeded the published surplus by $10,639,092, so that at the end of 1932 there was actually a deficit in the fund of that amount. The surplus for the end of 1933 was $634,989 *according to the old report;* but once more the reserve inadequacy (*indicated by the figures in the new report*) exceeded the surplus, this time by $10,635,011, so that there was actually a deficit of $10,635,011 at December 31, 1933.

It is well to bear the figures just cited in mind in approaching the question as to the probable status of the Fund's reserves at December 31, 1937. If the reserves were inadequate to this extent at the end of 1932 and again at the end of 1933, there is a strong presumption that they were still inadequate at the end of 1937 unless a substantial improvement in the method of setting up reserves can be demonstrated. An inspection of calendar year results whether in total or by accident year (as shown in Table "A") does not encourage the view that such a reform has been effected and the conviction that there has been no such reform grows upon further analysis.

Mr. Evans points out that if all reserves at the end of 1937 were adequate the method which I employed would indicate inadequacy if such reserves had been insufficient in the past. This is correct. However, the only correction in reserve method mentioned by either Mr. Fondiller or Mr. Evans is a change in the rate of interest employed in determining such reserves as are subject to interest discount (which reserves, according to Mr. Fondiller, represent only half the total loss reserve). Now the greatest possibility of inadequacy in loss reserves lies elsewhere, in such matters as underestimation of the duration of disability, over-optimism as to the ultimate seriousness of claims, inadequate provision for the cost of re-opened cases, and underestimation of

ultimate medical cost. Unless the Fund corrected the errors which cropped up as time went on in its reserve system as respects these important matters, the story after December 31, 1937 is bound to read like the one prior to that date. Were such corrections made? Evidently not, as we shall soon see.

According to Table 8 of the new report (or Table 17 of the old report) the incurred cost for accident years 1928-32 as of December 31, 1932 was, after deduction of interest, $70,176,000. The amount of interest deducted according to Table 17 of the old report was $6,893,000. However, at the lower interest rates realized in the period 1933-37 (about 22% lower—see Table "C"), this deduction would have been about $5,377,000, or $1,516,000 less, and the incurred cost after deduction of interest would have been correspondingly *increased* to $71,692,000. The Industrial Commission of Ohio (Report of December 1, 1938) states that the compensable accidents in the period 1928-32 numbered 194,779, which indicates an incurred cost (less interest at 1933-37 realized rates) of $368 per compensable accident.

As per Table 8 of the new report, the incurred cost, less interest, of the accidents of 1933-37 was $52,124,000 as of December 31, 1937. Compensable accidents in 1933-37 (from the Industrial Commission report above cited) numbered 142,029, so the incurred cost (less interest at 1933-37 realized rates) per compensable accident was $367.

It is evident, therefore, that at the end of 1937 the accidents of the latest five years were, on the average, no more highly reserved than were the 1928-32 accidents at the end of 1932—and this in spite of the following:

1. The ratio of fatalities to total compensable cases is higher in the second five-year period (*2.50%* in 1933-37 as against *2.13%* in 1928-32).
2. According to Mr. Fondiller, claims subject to interest discount were reserved at 3½% and 3% at December 31, 1937, whereas such claims were, at the end of 1932, reserved at higher interest rates (mainly 4%, I believe).
3. The Ohio Fund rate manual (effective July 1, 1939), page 10, states "The cost of claims has shown an increase of 9% in the last ten years, the compensation cost having increased 10% while medical, hospital, funeral, and court cost increased 8%." This statement is consistent with a tendency to increasing cost observed in certain other states.

The reserves for the 1933-37 accidents at the end of 1937, were, therefore, no more adequate, possibly less so, than were those for the 1928-32 accidents at the corresponding date five years earlier! And in this connection it is significant that if Table III of my recent paper is amended to reflect only what happened to the accidents of 1928-32 in the five years ended with 1937 the indicated reserve deficiency at December 31, 1937 is reduced but slightly, i.e., from $10,765,000 to $10,405,000! (See Table "B").

As for the alleged disturbing effect on my calculations of the reduction in the interest rate employed in discounting long-term cases, this factor is more than offset by another, namely, that not merely long-term cases, but *all cases in reserve* were in the developments of 1933-37 as employed in my calculations credited with their proportion of *the entire investment income* of the Fund, which averaged per year 4.26% of the mean reserves. (See Table "C"). The Commission's recent action in valuing all long-term reserves at 3% implies that it does not expect a yield higher than 3% for some time to come. My calculations accordingly were unduly optimistic in not eliminating the interest credited to reserves in excess of 3% thereon. I haven't the Fund's reserve figures which would be requisite to an adjustment of my calculations to reflect both these "disturbances," but since the reserves as regards any given accident year must have been declining sharply throughout the period 1933-37 and the rate of interest realized was highest at the beginning of the period when the reserves were highest, I have no doubt whatever that the net effect of such an adjustment would be to *increase* the indicated reserve deficiency.

My conclusion is, therefore, that there is every reason to anticipate a deficiency in the 1937 loss reserves of the Fund of an amount approximating my previous estimate of $10,765,000.

Comparative Benefit Cost

My other main point was that making due allowance for differences in benefit scales and in distribution of payroll by industry, the benefit cost in Ohio is higher than it is in the three non-

monopolistic states of New York, New Jersey and Massachusetts. In this I am wrong according to both of my critics.

In my 1936 paper I presented calculations indicating that the Ohio loss cost for accident years 1929-33 was 38% higher than that indicated by the Eastern pure premiums for approximately the same period *converted to the Ohio benefit level and applied to the Ohio payrolls.* I notice that this particular comparison has not been directly attacked. I fail to see how it could be successfully attacked. According to the present state of the record, then, the Ohio cost in 1929-1933 was 38% higher than it should have been, taking the experience of the Eastern states as a standard.

I believe there are good reasons why my opponents did not lock horns with this 1929-33 comparison, to wit:

1. The experience as presented in the new report for the period 1933-1937 shows "claims incurred less interest," instead of "claims" as shown for 1929-33 in the old report. This makes the new Ohio experience look a lot better than it really is in comparison with the Eastern experience in which the interest is not so deducted. (Mr. Evans admits that deducting interest from claims incurred would reduce the pure premium for 1929-1933 from $1.20 to $1.06.)
2. The yearly record of compensable accidents published by the Ohio Industrial Commission indicates that the Ohio experience for the period 1933-1937 was more favorable than that for the period 1929-1933, and I admit the probability that the corresponding improvement in Ohio pure premium cost was greater than that occurring in the three Eastern states during the same interval.

In focusing attention upon the period 1933-1937, therefore, my opponents are picking their ground. But there is still no doubt that the Ohio pure premium cost even for the latter period is high compared with that of the three Eastern states.

In Table "D" appears a computation of the ultimate cost of the Ohio accidents of 1933-1937, based on the cost of the accidents of 1928-1932. The only assumptions involved in this computation are:

1. That occupational disease claims represent 1.1% of total cost. (This, as explained in Table II of my paper, is based on figures from the old report.)
2. That after December 31, 1937 the cost of the accidents of 1928 will "develop" to the extent of $3,080,000. (This figure is taken from Table III of my paper, which table, for the

reasons above stated, appears to be a reasonable estimate of reserve developments after 1937. Bear in mind also that in only five years' time accident years prior to 1928 revealed reserve inadequacies of $4,735,000. (See Column 5, Table "A").)

3. That the cost per compensable accident will be no less for 1933-1937 than it was for 1928-1932. (This is a most conservative assumption, in view of what the Fund's own rate manual has to say about increasing cost, and the fact that in the later period there occurred more deaths relative to the total number of compensable accidents.)

The conclusion reached in Table "D" is that the accidents of 1933-1937 will cost ultimately $63,458,000, which figure is 122% of total "Claims Less Interest" ($52,014,000) shown in the Ohio 1933-1937 table of experience by industry group (Table 18 new report).

If in Table V of my paper the Ohio losses from Table 18 are modified by the factor 1.22 (instead of by the factor 1.347) then, for the industry groups comparable with those in use in the Eastern States the modified Ohio losses become $36,064,000 (instead of $39,818,667) and the ratio of Ohio cost to cost indicated by the Eastern pure premiums (on Ohio benefit level, and applied to Ohio payrolls) becomes 1.25 (instead of my previous 1.38).[2]

Even if the situation as to comparative benefit cost is not as bad as I thought it was, still it is bad enough, for a benefit cost 25% higher than that indicated by the standard of the Eastern experience is a grave affair indeed from the standpoint of employer and employee alike, particularly the latter—because benefits are disbursed only in proportion to *death* and *disability!* There is no reason I am aware of to doubt that claimants get their just due in New York, New Jersey, and Massachusetts—therefore, there must still be relatively more *death* and *disability* in Ohio!

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[2] As stated in my opening remarks, I am merely trying to present the facts and their significant implications. Therefore, I freely admit that on basis of all the evidence now before me, my previous estimate of 138% for the period 1933-1937 is probably too high (this has nothing to do with my similar estimate for the period 1929-1933, which still stands at 138%—subject to the possibility that the Ohio payrolls for insured employers were for the period 1929-1933 understated owing to lack of adequate payroll auditing.) The revision which I have made in my estimate is due not to anything which Mr. Fondiller or Mr. Evans has brought out, but to certain figures as to com-

pensable accidents and the interest income of the Fund appearing in a report of the Industrial Commission of Ohio, which report, unfortunately, was not before me when my paper was written.

The reduction in the number of compensable accidents in proportion to payroll from the 1929-1933 accident-year period to the 1933-1937 period is amazing. According to the Industrial Commission report of December 1, 1938 there were in the period 1929-1933 174,037 compensable accidents for insured employers. The corresponding payroll from Table 13 of the old report was $5,770,090,000. From the same Industrial Commission report the number of compensable accidents for 1933-1937 was 142,029, which should be related to the payroll of $5,699,248,000 appearing in Table 18 of the new report. These figures indicate a drop in the number of compensable cases per $1,000,000 payroll from 30.2 to 24.9. I say "amazing" not only because the two periods overlap to the extent of a year but also because corresponding figures in other states reflect a much smaller reduction for periods representing the same mean point in time, as follows:

NUMBER OF COMPENSABLE ACCIDENTS PER $1,000,000 PAYROLL

State	Policy Years 1929-1932	Policy Years 1933-1936
New York	19.9	18.9
New Jersey	22.0	20.8
Pennsylvania ...	20.5	20.1

Some small portion of the greater reduction in Ohio may possibly be attributed to change in the distribution of payroll by industry but another possibility is suggested by a comparison of what Mr. Fondiller has to say in his new report (beginning on Page 65) regarding payroll audits and a reference which he made to the same subject on Page 65 of his previous report. Apparently when the old report was written, there was no separate division devoted to the task of payroll auditing for Mr. Fondiller says, "The sixth division of the State Fund is the field force, which at present consists of 86 employees, including office clerks and stenographers. There is no supervisor in charge of all functions of this division. The field man is expected to make payroll audits, collect delinquent accounts, make rating inspections and also make claim investigations. There are practically no men who are well qualified for all these duties, as has recently been recognized by the Commission." However, according to the new report, there was at the time of the report a "payroll audit division" numbering 68 persons, whose duties were "to make payroll audits, aid in the collection of delinquent accounts and make rating inspections." It is to be noted that no reference is made to "claim investigations" upon the part of the members of this payroll audit division. On Page 68 of the new report reference is made to a "claims investigation division" "numbered 85 (located in 18 cities), 60 of whom are directly engaged in claim investigation work." Furthermore, beginning on Page 65 of the new report, Mr. Fondiller says "In our 1934 report, we pointed out that in the *ten years* which had elapsed prior to the date of that report, an estimated additional premium of $558,299 had been developed by audits. During the *nine months* ended September 30, 1938, $642,527 was developed by audits. This startling difference in the amount of additional premium developed, would indicate that millions of dollars in additional premium may have been lost under the prior inadequate payroll auditing procedure."

I suggest the possibility that some part of the apparent improvement in the accident rate may be due to more complete reporting of payrolls.

Direct Comment Upon Discussion by Messrs. Fondiller and Evans

I.

Mr. Evans refers to "the fact that several private insurance carriers in the workmen's compensation field met with financial difficulties during the dark days that fell within the five-year span 1929-33 which resulted in their failure to meet their obligations," and goes on to say "It is only proper to state at this point, that the Ohio Fund as well as all other state funds, met their claim obligations in full." These failures were, I admit, unfortunate, but they do not, to my mind, furnish any ammunition for the proponents of state monopoly; for these private carriers would not have "failed" if they had been permitted to continue in business regardless of their financial condition, as has been true of the Ohio Fund! Incidentally these failures did not, I am reliably informed, occasion any substantial loss to compensation claimants in the State of New York, and such loss in any degree can hardly occur in that state in the future owing to the special security fund to which Mr. Evans refers.

II.

The fifteenth paragraph of Mr. Evans' discussion embodies an interesting philosophy as to loss reserves. If I "get" him, it is his thought that it is perfectly all right for reserves to turn out to be inadequate provided that "in the light of knowledge available at the respective periods of valuation, it is probable that the reserves were conservatively established, and it would have been unreasonable to foretell the conditions that were to become potent factors in increasing losses in subsequent years!" This is an arresting idea, but, for well or ill, it is not favorably considered by state insurance departments generally, nor, to my certain knowledge, by the Insurance Department of the State of New York. Mr. Evans refers to the fact that the compensation loss ratio for 1930 policy year of the company with which I am connected increased from 84.2% at the end of 1931 to 111.07% at the end of 1937. I admit that, taking the results of this one policy year, it looks as if we were following Mr. Evans' theory. I can assure him, however, that such is not the case. Incidentally, at the end of 1934 our loss reserves as shown in Schedule "P" for

policy years 1930-1934 reflected incurred losses of $963,962.61 against earned premiums of $1,338,679.13, or a loss ratio of 72.0%. Five years later, at the close of 1939, the same five policy years as shown in Schedule "P" reflected incurred losses of $994,791.93 and earned premiums of $1,487,039.00, or a loss ratio of 66.9%. Please note that after a development of five years the loss ratio based on the loss reserves carried in our statement went down a few points, not up a few points!

Of course, this reference to the figures of a reinsurance company is not really germane to our subject, but Mr. Evans asked for it!

III.

In an endeavor to prove that the Ohio benefit cost is really lower than that in New York, Mr. Evans submits a calculation based upon twelve classifications selected by him. There are several reasons why this comparison of his does not prove his point, namely:

1. Mr. Evans ignores the difference in benefits between Ohio and New York, a position which is of course entirely untenable. For example, compensation for death in Ohio (other than funeral expenses) cannot exceed the maximum of $6,500. In New York there is no stated limit, compensation being payable to children until age 18 and to the widow until death or re-marriage. The maximum yearly compensation is $1,200 in New York as against $975 in Ohio.

   For total disability, compensation may continue in both states until death, but the weekly maximum in Ohio is $18.75, whereas in New York it is $25.00.

   These and other substantial differences in benefits cannot be ignored, and to even consider ignoring them is astounding. The "law differentials" used in both my papers were obtained from the National Council on Compensation Insurance, where they keep them in stock, i.e., the differentials were not specially computed at my request.

2. Mr. Evans' assumption that for comparative purposes the Ohio pure premiums may be taken at 99% of the manual rate is unwarranted, as even if the Ohio rates effective July 1, 1939 are adequate (and this is not proven), the pure premiums obtained in this manner contemplate full credit

for all interest earned on all reserves for all time to come, whereas this is not the practice in determining pure premiums in other states.

3. The assumption that the New York pure premium is exactly 60% of the premium at manual rates is also unwarranted, since the pure premium derived from actual experience may be higher or lower than 60% of the manual rate.

Furthermore, it is not at all convincing to base a demonstration upon only twelve classifications not only because in each state some classifications show up relatively better than others but particularly because of the differences which exist between the Ohio system of classifications and the system prevailing elsewhere. However, when Mr. Evans' example is reconstructed upon a more nearly correct basis, it actually supports my contention of relatively higher cost in Ohio. (See Table "E").

In this table, perforce I have been obliged to adopt Mr. Evans' assumption as to the Ohio pure premiums (99% of the manual rates) because I have no Ohio experience by individual classification. However, I have applied the law differential of .83 as used in my paper (the ratio of Ohio benefit level to New York benefit level) to the actual New York losses for the latest policy year available (1937—first report) and have then applied the New York pure premiums on the Ohio benefit level to the Ohio payrolls by classification.[3] The result is as follows:

Cost on Ohio payrolls based on New York experience reduced to Ohio level	$7,254,507
Cost on Ohio payrolls based on Ohio pure premiums (99% of Ohio rates)	8,322,871

Even this hand-picked group of classifications therefore indicates an Ohio cost 15% higher than the New York standard!

In view of the disparity already mentioned between the Ohio classification system and that of the other states, a comparison by broad industry groups is much more significant than any study of a few classifications. Incidentally, I did not "select" (as Mr.

[3] I should point out that in Table "E", I have included in the New York experience all classifications which should be included in a comparison with the Ohio classifications selected by Mr. Evans; for example, for comparison with Ohio Code No. 5040, I have included not merely New York 5040 but also Code numbers 5041, 5057 and 5059, since these three additional New York classifications would evidently fall under 5040 in Ohio.

Evans implies) the particular groups of industry classifications which I used in my comparisons. Instead, I used all groups which could be identified with those of the other states. If Mr. Evans would be kind enough to furnish me with a breakdown of the other groups by classification, I will be glad to extend my comparison to include additional groups and, in fact, all groups if that turns out to be feasible.

IV.

Both Mr. Fondiller and Mr. Evans bring in the question of expense loading. Now, that is a subject beyond the scope of either of my papers, which dealt with benefit cost, a matter of more "social significance." Suffice it to point out that in New York, New Jersey and Massachusetts the employer does not pay the full 40% expense loading unless he wants to, since, if he prefers, he may insure his compensation risk with a mutual company or, if he is located in New York, with the competitive Fund of that state. At any rate, this matter of expense loadings is more involved than would appear from my critics' comments thereon. It makes a great deal of difference to the insurance carrier when figuring out its expense loading whether it *collects* 6% of its premiums from the state, as is done in Ohio, or *pays* the state about 5% of its premiums, as is done in New York.[4] It also makes a difference to the employer in figuring the cost of his compensation insurance whether he pays a "consulting actuary" a fee in addition to his premium, as many evidently do in Ohio,[5] or does not have to pay such a fee, as is true elsewhere.

V.

I would like to point out that when Mr. Evans objects, as he does, to my recognizing the difference in industry distribution between Ohio and the other states, he is actually arguing to his own disadvantage, since (as is indicated in Table V of my paper), the pure premium (Ohio benefit level) of the three Eastern States for the compared groups was only $0.60 based on the Eastern

[4] Premium Tax 2%, Industrial Commission assessment about 2%, Security Fund 1%.

[5] See Page 81 of the new report under the caption "Service Bureaus."

States' payroll distribution, whereas when I applied this experience to the Ohio payrolls I *raised* this pure premium to $0.78 ($28,926,748 ÷ $3,721,709,000)!

VI.

Mr. Fondiller devotes several pages to the alleged error of my ways in the matter of credit for interest on reserves. What he says is almost entirely incorrect or irrelevant, and therefore I shall not answer him in detail. However, that the reader may be in no doubt as to just what I have done in this connection, let me say again that in considering *solvency*, I have assumed that the Fund is entitled to full credit for all the interest it can earn on its reserves. However, the comparison of Ohio pure premiums with those of other states is an entirely different matter, and in such comparisons I have assumed that interest earned *up to the time of striking off the experience* (which in this case is 2½ years after the mean accident date) should, to conform to the practice in other states, *not* be deducted from incurred losses, as this is the *only* way Ohio experience can be made fairly comparable with that of other states.

Incidentally, the amount of interest deducted from incurred losses, according to Table 17 of the old report, is in some cases surprisingly great. For example, according to said table, at the "1st valuation" of the accidents of 1930 the incurred claims were $16,446,602, but "accumulated interest" of $536,343 had reduced the first figure to "net claims" of $15,910,259. Fast work, that! According to Table "C" the rate of interest realized by the Fund on its mean loss reserves was 5.64% in 1930, an attractive rate even in those days. The loss reserve at the end of 1930 would be in the neighborhood of 70% of the gross incurred claims or, say, $11,500,000 (according to figures appearing in the Ohio rate manual, about 30% of the cost of the new claims incurred in a given year are paid out in that year), so the mean loss reserve for the year would be about $5,750,000. *But* $536,343 is 9.33% (*not* 5.64%) of $5,750,000! The results up to the first valuation for accident year 1932, similarly analyzed, indicate an amount of interest equivalent to approximately 14.53% of the mean loss reserves for the year! In the hope that some member of this Society

may be able to arrive at the formula by which this "accumulated interest" is determined, I am attaching hereto (Table "F") an exact copy of Table 17 from the old report.

* * * * * * * *

Mr. Fondiller intimates that I am tilting at windmills. For this once, I am happy to agree with him, for windmills are quaint and ostensibly inexpensive contraptions which have become outmoded because they do not give as much or as quick service as is required in this streamlined age!

* * * * * * * *

The writer gratefully acknowledges the assistance of Mr. Howard G. Crane, Mr. James C. Barron and Mr. John J. Gately, without whose faithful and capable efforts this paper and the above answer to the discussion thereon could not have been completed. I am particularly indebted to Mr. Crane for his constructive criticism of the various technical methods employed.

TABLE A

CALENDAR YEAR CLAIMS INCURRED (LESS INTEREST) APPORTIONED TO YEAR OF ACCIDENT

Thousands Only (000 Omitted)

Calendar Year	(1) From Table 22, New Report) Claims Incurred	(2) Minus Investment Earnings	(3) Claims Less Interest	(4) All Years (3)×.96(a)	(5) All Prior to 1928 (b)	(6) 1928 (c)	(7) 1929 (c)	(8) 1930 (c)	(9) 1931 (c)	(10) 1932 (c)	(11) 1933 (c)	(12) 1934 (c)	(13) 1935 (c)	(14) 1936 (c)	(15) 1937 (c)
				Claims Incurred, Less Interest, O. D. Self-Insurers and Safety Violations — By Accident Year											
1933	$ 9,057	$1,884	$ 7,173	$ 6,886	*$1,752*	$ 443	$ 313	$ 422	$ 243	$ 235	$6,982				
1934	13,947	1,762	12,185	11,698	1,343	247	598	693	468	177	*62*	$8,234			
1935	12,589	1,714	10,875	10,440	3,968	*61*	*262*	*630*	*503*	*200*	*90*	*319*	$8,537		
1936	16,874	1,622	15,252	14,642	*722*	421	416	388	197	368	372	638	424	$12,140	
1937	21,351	1,337	20,014	19,213	1,898	264	756	592	382	53	199	357	555	*542*	$14,699
1933-37	$73,818	$8,319	$65,499	$62,879	$4,735	$1,314	$1,821	$1,465	$ 787	$ 633	$7,401	$8,910	$9,516	$11,598	$14,699

(a) Deduction to exclude self-insurers' claims, safety violations and occupational disease claims. Probably 2% would have been enough to deduct for these items; therefore, column (5) is certainly understated.

(b) Column (4) minus sum of columns (6) to (15), inclusive.

(c) From Table 8, new report (figures after "1st report" are differences between successive reports as to any given accident year).

RESERVE DEFICIENCY INDICATED BY DEVELOPMENT OF INCURRED LOSSES DURING FIVE YEARS ENDED DECEMBER 31, 1937 (BASED ON TABLE 8, P. 23, NEW REPORT)
ACCIDENT YEARS 1928-1932 ONLY

Year of Accident Occurrence	Incurred Losses (in Thousands) for Each Accident Year as of Successive Valuation Dates (a)									
	1st Val.	2nd Val.	3rd Val.	4th Val.	5th Val.	6th Val.	7th Val.	8th Val.	9th Val.	10th Val.
1928					$14,603	$15,046	$15,293	$15,232	$15,653	$15,917
									Total $15,653	$15,917
									Ratio—1.017	
1929				$17,769	18,082	18,680	18,418	18,834	19,590	
								Total $34,066	$35,243	
								Ratio—1.035		
1930			$15,874	16,296	16,989	16,359	16,747	17,339		
							Total $50,458	$51,405		
							Ratio—1.019			
1931		$13,045	13,288	13,756	13,253	13,450	13,832			
						Total $63,535	$64,290			
						Ratio—1.012				
1932	$ 8,884	9,119	9,296	9,096	9,464	9,517				
					Total $72,391	$73,052				
					Ratio—1.009					
				Total $56,917	57,788					
				Ratio—1.015						
			Total $38,458	39,148						
			Ratio—1.018							
		Total $22,164	22,584							
		Ratio—1.019								
	Total $ 8,884	9,119								
	Ratio—1.026									

Year of Accident Occurrence	(1) Incurred Loss (In Light of Valuation to 12/31/37)	(2) Deficiency Factor	(3) Deficiency as of Dec. 31, 1937 (1) × (2)
1928	$ 15,917,000	.000	$ —o—
1929	19,590,000	1.017 — 1.000 = .017	333,000
1930	17,339,000	(1.017 × 1.035) — 1.000 = .053	919,000
1931	13,832,000	(1.053 × 1.019) — 1.000 = .073	1,010,000
1932	9,517,000	(1.073 × 1.012) — 1.000 = .086	818,000
1933	7,401,000	(1.086 × 1.009) — 1.000 = .094	696,000
1934	8,910,000	(1.094 × 1.015) — 1.000 = .110	980,000
1935	9,516,000	(1.110 × 1.018) — 1.000 = .130	1,237,000
1936	11,598,000	(1.130 × 1.019) — 1.000 = .151	1,751,000
1937	14,699,000	(1.151 × 1.026) — 1.000 = .181	2,661,000
Total Latest 5 Yrs.	$ 52,124,000		7,325,000
Total 10 Yrs.....	$128,319,000		$10,405,000

Note: (a) "First Valuation" is at end of Calendar Year in which accident occurred; successive valuations annually thereafter.

TABLE C

INTEREST EARNED ON RESERVES

Year	(1) Reserve on Unpaid Claims (000 omitted) (a)	(2) Mean Reserve (000 omitted)	(3) Interest ("Investment Earnings on Claim Reserves") (000 omitted)	(4) Yield on Mean Reserve (3)/(2)
1928	$46,853	$46,816 (c)	$2,730 (c)	5.83 (c)
1929	46,779	46,816 (b)	2,730 (d)	5.83
1930	45,471	46,125 (b)	2,602 (d)	5.64
1931	41,962	43,716 (b)	2,382 (d)	5.45
1932	38,807	40,384 (b)	2,008 (d)	4.97
1933	35,409	37,108 (b)	1,884 (e)	5.08
1934	37,369	36,389 (b)	1,763 (e)	4.84
1935	37,643	37,506 (b)	1,714 (e)	4.57
1936	41,362	39,503 (b)	1,622 (e)	4.11
1937	47,893	44,629 (b)	1,337 (e)	3.00

Average (arithmetic) yield 1928-32 = 5.54%
Average (arithmetic) yield 1933-37 = 4.32%
Ratio yield 2nd period to that of 1st period = $4.32/_{554} = .78$
Average (weighted) yield 1933-37 = 4.26

(a) From Table II, Report of Industrial Commission of Ohio, December 1, 1938.
(b) (Column (1) + same column previous year) ÷ 2.
(c) Assumed to be the same as for 1929.
(d) From Table 16, Old Report.
(e) From Table 22, New Report.

TABLE D

ESTIMATE OF ULTIMATE COST OF THE ACCIDENTS OF 1933-1937

Claims incurred as of December 31, 1932, accident years 1928-32 (before interest deduction*). (From Table 17, old report)	$77,069,000
Divide by .989 to cover Occupational Disease	77,926,000
Add actual developments from December 31, 1932 to December 31, 1937. (From Table 8, new report)	6,020,000
Expected developments after December 31, 1937. (From Table III of my paper)	3,080,000
Ultimate cost of 1928-32 accidents	$87,026,000

From Report of Industrial Commission of Ohio
(Dated December 1, 1938):

	1928-32	1933-37	Ratio of 2nd to 1st Period
Number of compensable accidents	194,779	142,029	.72918

Ultimate cost of 1933-37 accidents therefore = $87,026,000
× .72918 = $63,458,000

Factor to raise "claims less interest" and Ohio pure premiums from Table 18, new report, to ultimate cost level is therefore

$$\frac{63458}{52014} = 1.220$$

* See discussion of the treatment of interest under Caption VI.

TABLE E

Comparison of Ohio and New York Pure Premiums For 12 Classifications Selected by E. I. Evans

Ohio Data						New York Data						
								POLICY YEAR 1937—LAST REPORT				
Code No.	Classification Wording	7/1/39 Rate	Pure Premium (.99×(1))	33–37 Payroll in Thousands (000 Omitted)	Expected Losses (2)×(3)	Code No.	Classification Wording	Payroll in Thousands (000 Omitted)	Losses	Pure Premium (6)÷(5)	Pure Premium on Ohio Level (.83)×(7)	Expected Losses on Ohio Payroll (8)×(3)
		(1)	(2)	(3)	(4)			(5)	(6)	(7)	(8)	(9)
2000	Bakeries	$ 1.20	$ 1.188	$ 84,436,	$1,003,100	2001	Cracker Mfg.	$ 3,176,	$ 25,852	$	$	$
						2003	Bakeries, incl. S.; D. C. & H.	42,205,	595,074			
						2016	Breakfast Food Mfg.	206,	5,585			
							Total	45,587,	626,511	1.374	1.140	962,570
2581	Laundries	1.00	.990	32,879,	325,502	2580	Laundries, Wet Wash	288,	2,723			
						2581	Laundries, N.O.C., including handwork	34,327,	348,347			
							Total	34,615,	351,070	1.014	.842	276,841
2660	Shoe Manufacturers	.40	.396	59,909,	237,240	2660	Shoe or Boot Mfg. or Repairing	23,485,	104,145	.443	.368	220,465
3081(a)	Iron Foundries	2.00	1.980	52,628,	1,042,034	3081	Iron Foundries, N. O. C., including Malleable Iron Works	7,243,	144,499	1.995	1.656	871,520
3632	Machine Shops	1.00	.990	151,347,	1,498,335	3515	Textile Machinery Mfg.	2,529,	30,621			
						3516	Loom, Harness or Reed Mfg.	3,	666			
						3548	Printing and Bookbinding Mach'y Mfg.	4,317,	34,825			
						3559	Confectioners Machinery Mfg.	3,641,	27,998			
						3632	Machine Shops, N. O. C.	16,943,	268,181			
						3805	Engine Mfg.—Aircraft or Auto	499,	1,434			
						3900	Typesetting Machinery Mfg.	4,863,	26,673			
							Total	32,795,	390,398	1.190	.988	1,495,308
4029	Brick Mfg.	1.60	1.584	32,004,	506,943	4021	Brick, Clay, Earthenware or Tile Mfg. N. O. C., including D. C. & H.	1,902,	44,599			
						4024	Brick Mfg., Fire or Enameled, incl. D. C. & H.	130,	193			
							Total	2,032,	44,792	2.204	1.829	585,353

TABLE E—*Continued*

COMPARISON OF OHIO AND NEW YORK PURE PREMIUMS FOR 12 CLASSIFICTAIONS SELECTED BY E. I. EVANS

OHIO DATA						NEW YORK DATA						
								POLICY YEAR 1937—LAST REPORT				
Code No.	Classification Wording	7/1/39 Rate	Pure Premium (.99×(1))	33-37 Payroll in Thousands (000 Omitted	Expected Losses (2)×(3)	Code No.	Classification Wording	Payroll in Thousands (000 Omitted)	Losses	Pure Premium (6)÷(5)	Pure Premium on Ohio Level (.83)×(7)	Expected Losses on Ohio Payroll (8)×(3)
		(1)	(2)	(3)	(4)			(5)	(6)	(7)	(8)	(9)
5040	Structural Steel Erection	$20.00	$19.800	$2,947,	$583,506	5040	Iron and Steel Erection	$881,	$170,717			
						5041	Painting, Bridge and Steel Structures	67,	38,637			
						5057	Iron and Steel Erection, N. O. C.	999,	163,291			
						5059	Iron and Steel Erection, not riveted	99,	2,620			
							Total	2,046,	375,265	$18.341	$15.223	$448,622
7531(b)	Electric Light & Power Cos.	1.80	1.782	21,047,	375,058	7539(c)	Electric Light & Power Cos., N. O. C. including S.; D. C. & H.	21,251,	395,444	1.861	1.545	325,176
							Total	21,251,	395,444	1.861	1.545	325,176
8747(d)	Traveling Salesmen	.40	.396	271,624,	1,075,631	8742	Salesmen, Collectors and Messengers—outside	379,128,	1,043,211	.275	.228	619,303
8810(e)	Clerical Office	.05	.050	943,063,	471,532	8810	Draughtsmen and Clerical Office Employees, N. O. C.	948,211.	497,297			
						8813	Airplane Clerical Employees	2,882,	10,937			
							Total	951,093,	508,234	.053	.044	414,948
9050	Hotels	.80	.792	54,724,	433,414	9052	Hotels	65,629,	586,603	.894	.742	406,052
9071	Restaurants	1.10	1.089	70,760,	770,576	9079	Restaurants	116,594,	1,243,704			
						9091	Catering	615,	10,918			
							Total	117,209,	1,254,622	1.070	.888	628,349
GRAND TOTALS		$	$ .468	$1,777,368,	$8,322,871			$1,682,113,	$5,824,794	$ .346	$ .287	$7,254,507

(a) Does not include Malleable Iron Works, Code No. 3086, which takes a lower rate.
(b) Does not include Construction, Code No. 7534, which takes a higher rate. New York Code No. 7539 includes Construction Work done by assured.
(c) Includes Construction.
(d) Does not include Collectors, Adjusters, Appraisers, etc., Code No. 8741, which takes a higher rate.
(e) Does not include Electric Light and Power Cos.' Office Employees not exposed to operating hazard, Code No. 7538, which takes a higher rate.
NOTE: Ex-medical payroll was included in New York experience. However, such payroll represented approximately 1.6% of total payroll.

TABLE F

(Exact Copy of Table 17 of Old Report)

DEVELOPMENT OF CLAIM RESERVES

Incurred Claims Minus Accumulated Interest

Year		1st Valuation	2nd Valuation	3rd Valuation	4th Valuation	5th Valuation	6th Valuation
1928	Incurred Claims	$20,075,013	$17,880,809	$17,850,274	$17,444,356	$16,641,486	$17,182,265
	Accumulated Interest	741,416	1,172,726	1,525,935	1,757,691	2,038,244	2,135,668
	Net Claims	19,333,596	16,708,083	16,324,339	15,686,665	14,603,242	$15,046,597
1929	Incurred Claims	20,126,188	20,853,572	21,481,978	19,793,296	20,252,180	
	Accumulated Interest	659,354	1,180,075	1,570,615	2,024,241	2,169,653	
	Net Claims	19,466,824	19,673,497	19,911,363	17,769,055	$18,082,527	
1930	Incurred Claims	16,446,602	18,147,568	17,348,183	17,943,107		
	Accumulated Interest	536,343	939,315	1,473,554	1,646,556		
	Net Claims	15,910,259	17,208,253	15,874,629	$16,296,551		
1931	Incurred Claims	13,005,734	13,927,917	14,339,677			
	Accumulated Interest	347,511	882,777	1,051,442			
	Net Claims	12,658,223	13,045,140	$13,288,235			
1932	Incurred Claims	9,360,485	9,737,752				
	Accumulated Interest	476,011	617,997				
	Net Claims	8,884,474	$ 9,119,755				
1933	Incurred Claims	7,120,556					
	Accumulated Interest	137,683					
	Net Claims	$ 6,982,873					

INFORMAL DISCUSSION

The Probable Aspects of the Present War on the Casualty Business

MR. JOHN A. MILLS:

When we start discussing "The Probable Effects of the Present War on the Casualty Business" we are immediately confronted with the problem of deciding the probable pattern that the war will take, also its probable length and its probable severity. It would take a prophet to predict the course of the war whereas we are mere actuaries.

In discussing the problem we probably should proceed on the assumption that the war will reach considerable magnitude, because obviously if it is short-lived or unimportant in its intensity it cannot have much effect on the casualty insurance companies.

As my part in this morning's discussion, I would like to say a few words about what the last World War can tell us and also what it cannot tell us about the probable effects of another war of about the same magnitude.

First of all, there is ample evidence to sustain the belief that the pattern of the present war will be decidedly different. At the time of the outbreak, in 1914, business had been suffering from a minor depression for a period of about a year and a half, and immediately following the outbreak the depression continued and, if anything, was accentuated. At the time of the current outbreak, business was definitely on the upgrade, and the purely forward buying of domestic commodities well in advance of actual war orders promised to carry business to new high levels during the months immediately ahead.

The difference in the effect on our security markets well illustrates the difference in the circumstances surrounding the opening of the war and the difference in the attitude of the public towards it. In 1914, the outbreak was followed by a severe crash in security prices which necessitated closing the exchanges for several months. At the time of the present outbreak, it was taken with comparative calm, and after a few hours of indecision there followed a wave of buying, particularly in those industries which appeared to be most favored by the export market.

The belligerents in the present war had been preparing for it a

long time and they had accumulated a tremendous volume of war supplies. The feeble fighting that has taken place so far has not made a dent in the accumulated supplies, and it appears entirely possible that the extent of our future exports has been grossly overestimated except, perhaps, in the case of airplane manufacturing. If this feeble fighting continues it is entirely possible that we will have to look toward tremendous rearmament purchases on the part of our own government, or other forms of deficit financing, to sustain the embryo "war boom," after the first of the year.

The action of the security markets and the hoarding of certain commodities such as sugar suggests that most people remember the last year or two of the last war a great deal more clearly than they do its beginning. It also suggests that there are many who have the feeling that the war may last a long time and that it may reach unprecedented severity. Now if it does, such a war can be expected to have considerable effect on the casualty insurance business.

In judging the probable effects of a serious war we are concerned with what it will do to production, to underwriting results, to the asset side of the statement and to the liability side of the statement.

Looking back at the record of the last World War, we find that production increased tremendously between 1913 and 1919; in fact, the increase was about 170%. But, on analyzing it more closely, we find there were other influences at work which were at least as important as the war itself. First we had the passage of workmen's compensation laws and second, we had the tremendous expansion in the automobile industry.

We, as actuaries, are more concerned with the effects of the war on underwriting results than with its effects on production. When we glance at the available records, we find that underwriting results were apparently satisfactory in spite of the fact that tremendous equities were being accumulated in the unearned premium reserves of the companies during the war period. In analyzing the underwriting results we should, of course, consider the various casualty lines individually because the war cannot be expected to influence them all in the same way.

Looking at workmen's compensation we find that the ten largest

stock companies and the three largest mutuals had a combined loss ratio that ranged between 60% and 70% during the war period. This was quite satisfactory, but we should look at some of the underlying causes for this, because these causes may not be at work to the same extent in the event of another world war.

First of all, the passage of workmen's compensation laws forced many employers to the realization that accidents represented an economic waste and it encouraged them to do something about it. The insurance companies also encouraged them to do something about it by granting rate credits for the effective safeguarding of mechanical equipment.

We should also recall to mind that at the time of the last war the majority of accidents were occurring by reason of mechanical equipment, and it was the effective safeguarding of that equipment that, in an important way, brought about a sharp decline in accident frequency per man hour of exposure. Machine accidents no longer make up the bulk of all industrial accidents, and consequently we cannot expect to have as substantial a cushion against the increase in accident frequency that ordinarily accompanies a war boom.

The increase in accidents that accompanies a war boom arises for a number of reasons, including, first of all, the fact that the re-employed man, even if he comes back to the same kind of work that he was doing before, faces changed conditions in the plant. Second, the employer has retained the best help, and those who are re-employed include many who are below average in intelligence and efficiency. Third, as production increases, less modern and less safe equipment is brought into use. And fourth, under the pressure for increased output, it is entirely possible that insufficient time may be taken to show the new man how to do the job safely.

If I were asked to guess how the rate level compared in 1914 with that in 1939, I would say that it was probably higher in 1914 in comparison with actual loss costs than at the present time. Although the companies have been having a very satisfactory experience on workmen's compensation for a number of years, there is good reason to believe that loss ratios are swinging toward higher levels. First of all, rate decreases—real rate decreases—after removing the effects of increase due to law amendments,

have been rather sharp over the past three years, and secondly there is some reason to suspect that other decreases may be in the offing. When and if the need for higher rates arises, there will be a delay due to the waiting period between the experience period on which the rates are calculated and the period to which they are applied and also because of the very sizable profit balances that have been accumulated under the calendar year method of determining contingency loadings.

Fortunately there are a number of important favorable factors. First of all, a war boom usually brings with it wage increases. National figures on wages are not available for the period of the last war, but looking at the record for the State of New York we find that wages virtually doubled during the war period. In judging what will probably happen this time, we can't afford to lose sight of the fact that wages have probably been held at an artificially high level by reason of New Deal activities, and that as a result we may not realize a proportionate increase in the event the present war boom reaches the magnitude of the last one. Also, increased wages, increased living costs, and plenty of work, practically eliminate malingering. We usually find that the indemnity provisions of workmen's compensation laws are not kept in step with increased wages and that there is such a wide margin between the two that the man who is able to work can't pass up the difference.

Now let us glance at the automobile record. Motor vehicle fatalities in 1914 numbered 273 per 100,000 registered cars. In 1919 this had fallen to 175 per 100,000 cars—a decrease of more than one-third. In 1938, motor vehicle fatalities numbered 108 per 100,000 cars, and it is unlikely that the next four or five years will produce a comparable decrease.

A war boom means more jobs, more cars, greater congestion. It means higher wages, more money for drink, more money for gas, more mileage, and that in turn warns us there may be more accidents per car. Later on, however, we may have a situation similar to the one that obtained during the last war, where the government demanded that there be conservation of gasoline supplies, and we may get "gasless Sundays," and in that event of course there will be a sharp decrease in the accident frequency particularly in the case of vehicles that are not used for business purposes.

A war boom usually brings a rise in the price level not only of the things we eat but of the things we use, and this means higher average costs for both property damage and personal injury cases.

I am not in a position to say whether the rate level in 1914 was higher or lower than at the present time, but here again we know that there have been very sizable rate decreases during the past two years, and that there is little margin remaining to absorb any increase in costs that may arise by reason of a war boom.

Looking at the asset side of the statement and going back again to the last great World War, we find that the thirteen companies to which I previously referred realized an average investment gain equivalent to 4% of their earned premiums during the six years 1914 through 1919. The gains ranged between 2% and 6% per annum.

It would appear, offhand, that the most serious effect of a severe war would be felt on the liability side of the statement, because it will cost more money to liquidate outstanding claims. Fortunately, the companies have improved their reserve position tremendously during the past five years, and the vast majority of them are in a position to face a higher cost on outstanding losses without a serious result on their surplus.

On the whole I would say that the company that has a well diversified business and which has taken full advantage of the past five years to put its house in order, has little to fear from a war that does not exceed the magnitude of the last World War. One of the dangers on which others here are better qualified to speak is that another war may bring further infringement of the government into private business, and particularly into the casualty insurance business.

MR. A. H. REEDE:

I'd like to make a few observations with regard to some of Mr. Mills' remarks on the compensation insurance business.

It appeared to me that in the course of his excellent discussion of this matter, Mr. Mills missed one or two points that are extremely important to this group. With regard to the question of trade, for example, it seems important to divide our trade with the European nations into at least two parts before we draw any con-

clusions as to its effect on employment in American industry. In the first place, we should take from the European trade that trade which goes to Central Europe and more especially Germany.

As he sagely observed there is a very great difference between the situation to-day and the situation in 1914 and 1918. At that time our trade with Germany alone, for example, represented nearly 10% of our foreign trade. At the present time—that is, as of September 1st (directly before the war started), rather—it represents less than 3% of our total foreign trade. Therefore, the loss of this trade with Central Europe, or more especially with Germany, is much less severe than that loss was in the opening months of the first World War. And during that period, from August, 1914, to May, 1915, the effects of the loss of the trade with Germany aggravated, I believe, that period of depression in which we found ourselves in 1914.

The question of the trade with Western Europe, particularly with England and France, involves the further question whether Germany can interrupt that trade sufficiently to cause it to be much less a factor in our employment situation. Thus far apparently the interruption of American trade with Europe, chiefly in European vessels, has not been sufficient to indicate that we need have any fear on that score.

Now on the question of the effects on our employment, we already see a very considerable increase in American employment, and presumably a considerable portion of that is due to the operation of the war. We find, for example, that the most spectacular increase in employment has taken place in the steel industry, and if we examine it more closely we find that has affected certain types of steel goods which are used for war purposes. We find that the most spectacular increases in the production of food articles have affected certain articles of food such as canned meat and canned fish, both of which are important items in the diet of soldiers. Whether these developments will continue or not, depends on the extent of interruption of American trade with Europe. If the present trend continues, what will the effect be on our industrial accident experience?

It seems to me that we have rather good evidence on that point. In the October number of the Monthly Labor Review, the United

States Department of Labor has released material with regard to industrial injuries in the United States in 1938. Their sample includes about 4,500,000 workers—that is, if normal employment conditions exist—and about 4,000,000 of them are in manufacturing industries. It would be better for our purpose if the sample were more representative, but with regard to manufacturing industries we find that from 1937, a year of very considerable employment, to 1938, employment declined 15%, and man hours about 22%. Yet, on the other hand, accidents declined much more—fatalities and temporary injuries, about one-third, and permanent injuries nearly one-half. The time lost on account of these injuries dropped 40%; the frequency rate dropped 17%; the severity rate, 25%. In other words, both frequency and severity fell off during a period of decline in unemployment.

If you compare the years 1935 and 1936, you will see the situation in reverse. In other words, industrial accidents increasing more than employment.

Now it is true these are accident rates, and of course underwriters are interested more in loss costs. As Mr. Mills has shrewdly observed, it is a question there of deciding whether the possibility that a greater number of these workers may fall within the limits set by the maximum weekly compensation, etc.—will offset the tendency to greater accident frequency.

He pointed out that at the present time our wage rates were at artificially high levels, and thought that perhaps we might not see as great an increase in wage rates during this war as we saw during the period 1914 to 1918, for that reason. This is one point where it seems to me wise to draw a distinction between wage rates and earnings. It is very true that wage rates are, at the present time, at an artificially high level, but it is also true that the people who are earning these wage rates are, to a very considerable extent, not working full time. So far as the maximum rate provisions of our workmen's compensation laws are concerned the question of earnings is much more important than the question of rates, because they refer to past weekly earnings and not to hourly wage rates. We may see, therefore, a very considerable increase in weekly earnings with little or no change in wage rates. Indeed, the developments of the last two months already indicate some increase in weekly earnings. If that continues, it undoubt-

edly will tend to offset any increases in industrial accident frequency and severity.

With regard to the production of war materials, whether or not we are able to ship them to England, there is no question that we shall produce a very considerably larger volume simply because of our attitude toward our own defensive needs. Our attitude is not nearly as passive as it was in 1915 and 1916.

MR. GREGORY C. KELLY:

I could not be expected to speak on compensation premiums and premium rates in approaching the effect of war on casualty insurance. I think the war will have little to do with them.

In Pennsylvania we have a loss ratio of 57% for the 22 years of compensation history to 1937, the last year now reported. These loss ratios have ranged from 32% in 1918 through 73% in 1930. There are loss ratios of 62%, 66%, 71% and 50% in the several years, but it totals up to 57. Rates have run from 61¢, 58¢, 57¢, 85¢, $1 and $1.15 per hundred of payroll, but over the 22 years they average 77¢. A number of changes of benefits have occurred. Average wages have gone from $15.50 per week in 1916 to $27 in 1930, $19.45 in '33, $24.87 in '37, and compensation of course has changed in proportion. But over the 22 years, we still have 57% as the loss ratio.

The lag of premium rates is not very long after any circumstance affecting the rates and the premiums. Suppose the interval is a matter of two years or three years; that is a relatively short period. If losses increase in proportion to premiums we can make up the deficiency readily. If the trend is the other way, we can make the appropriate rate adjustments. It seems to me, therefore, that the discussion should center on what the war will do to the investments of the companies, rather than on losses or accident rates.

It has been said by some financial advisers that the war will cease in the summer through the collapse of Germany, and they have given rather good reasons for it, but it seems to me that the circumstances are viewed in accordance with American psychology rather than with German psychology, and that we are no closer to a knowledge of the length of the war than we were before it

started. Of course it is the length of the war that will determine its effect. We are in a better position in casualty insurance than we were in the last war. There have been several years of high rates. Unfortunately, such a period is followed by underwriting carelessness and we can lose this advantage if we don't watch our step.

Dr. Huebner, in the General Alumni Magazine of the University of Pennsylvania, has referred to the increase of public debt, which has gone from 16,000,000,000 in 1933 at the beginning of the post-war depression, to 40,000,000,000 at the present time, with an unbalanced budget of 2,000,000,000. He says also that State and local public indebtedness raises this total to some 75,000,000,000 and that consequent increased taxation, inflation and decrease in the standard of living may readily include a program of dollar devaluation and "soaking the rich," with the accompanying depreciation of bonded indebtedness and "real" property. A long-continued war with an increase of public indebtedness and a tremendous increase in taxation may be followed by a different social organization than the one we know at the present time.

I cannot feel so gloomy about it because we are more observant than we were in the last war; our knowledge of events is clearer, we have had the experiences of the last world war to go through and may not have an extreme increase in the production of war supplies, with consequent post-war depression, and we can sit back rather comfortably and watch events so closely that, no matter what does come, we will be prepared for it.

Mr. Phillips, in the proceedings of the thirty-second Annual Convention of Life Insurance Presidents, made a study of the changes of investments of life companies, indicating internal correction of their investments. He said a couple of rather interesting things: First, that the foreign bonds held by life insurance companies are about 2% of the whole and are restricted almost altogether to Canadian bonds—very little European. He gives the present percentage as 12.1% railroad, 12.8% public utilities, 5.7% other bonds and stocks, government bonds of the United States 17.9%, municipal 5.8%, foreign 2%; mortgages—3.1% farm, 16.3% urban; policy loans 12.1%, real estate 8%.

It appears to me that the long-time effect of war on casualty insurance will be noted to a greater extent in security values, com-

pany investments and in the mediums of exchange rather than in premium rates.

MR. THOMAS F. TARBELL:

When the President put me on his list and sent me a little note, I told him I would be very glad to think the matter over and if I had anything that seemed worth contributing I'd be very glad to do so. I made a few notes here and I find that practically everything that I had in mind has been covered by previous speakers, particularly Mr. Mills. There is, however, one phase of the matter which I think is what the President has in mind.

In general, assuming of course that we are going to have a war of reasonable duration, there will be increased industrial activity. It won't be probably quite as chaotic as that in connection with the last war for the reason that the last war came out of a clear sky, so to speak, whereas it has been pretty well felt for a year or more that this present war was inevitable. I think that is particularly true of England and France, and that they had been making certain preparations, in particular an increase in the manufacture of airplanes. As I understand it, very quietly plans were made in Canada materially to speed up production of airplane parts and other war materials. I think we can assume, however, that in workmen's compensation there will be an increase in payrolls, and that there will probably be some increase in accident frequency, but probably not a commensurate increase in accident severity. Production, so to speak, will be more "under control"; accident prevention will be better organized—has been better organized.

The immediate effect upon the results of casualty insurance—that is, the effect on profit or loss—will probably be either unfavorable or at least not favorable, for the reason that there will be a lag in the collection of earned premiums. At the present time there is evidence that advance premiums on compensation insurance are on a depressed level, and they will probably continue to be depressed. Of course, ultimately, the earned premiums will catch up, and in due course I assume that the companies will show substantial profits from the compensation business. However, I think one of the things we must bear in mind is that those profits, if they do materialize, will not be permanent; they will not be retained, because under the present plan of determining compen-

sation rate levels, we cannot probably anticipate more of a profit than that provided for by what you might call the "minimum contingency loading." Therefore I think that we should make sure that if we do show substantial profits, we shall lay them aside and use them to apply against unfavorable experience that will follow. The incidence of loss ratios, so to speak, is not current. In other words, there is a lag that will have a material effect on the results from year to year.

In general (and this has been observed), I think there will be an increase in our premium volume right along the line in casualty insurance.

Another factor which must be kept in mind is that if prices show a material rise as the war continues, this will, of course, have an adverse effect upon the loss experience ratios of the companies and then, after the war is over, we will be in for a period of readjustment. There will probably be a decrease in volume, and the companies will be faced with, not only lower rate levels for compensation, but with the problem of getting their expense ratios in line.

At the present time there has been some evidence of increased premium volume, particularly in the surety line. The war material contracts that are being let in this country are mostly covered by surety bonds, and so far as I can find out the only companies which are making much gain in premium lines are those which are transacting the bonding business.

MR. HIRAM O. VAN TUYL:

After Mr. Mills had spoken and after Mr. Tarbell had "mopped up," there wasn't very much left of my original remarks that hadn't already been brought out.

I am impressed with the fact that casualty insurance is a composite business. We are affected by business activity in all different lines, and it is the composite effect that has its influence upon the financial statement and upon the production figures and on the underwriting, and not just one particular business.

We realize that, as a result of the present war, there will be a dislocation of business. Not all industry will benefit. There will be, in export lines particularly, a great deal of cutting down. I noticed in this morning's paper a reference to the effect of the war

on the shipment of fruit. It appears that exports of this kind to England will be much reduced, as they will be buying missiles of a harder character. So, while the armament industry will increase (and that will have its outreach in many lines of business), yet there will be many lines which will suffer. But it is the average which will, finally, influence casualty insurance.

Then, there is the lag which we realize occurs in all casualty insurance. We do not feel immediately the effect of an increase or decrease in business activity; it takes some time. In the matter of payrolls, our losses will come in much more promptly than the increase in payrolls or the effect of additional employment or of increasing wage levels.

If we were providing insurance for only one industry and had to estimate what is going to happen, we might have more occasion for worry than we do in a business which is influenced by the combined effect upon business as a whole of many diverse factors. For instance in the last issue of "Business Week" in regard to the copper industry there appeared the following, "Foreign demand for copper, particularly, has been brisk, despite the fact, right now, that little metal is being wasted in warfare. Yet those in the trade who face facts haven't any more than the foggiest notion where they're going. Big customers like the brass fabricators, electrical equipment and others, are doing an excellent business, yet the copper producers don't know whether the big buying of the metal has been in any large measure protection against price rather than protection against real demand. In a world which worries one day about passive war and the next about inconclusive peace, the problems will persist." We are in a fortunate position perhaps in being able, at present at least, to look at the question somewhat philosophically.

There is one phase of the effect of the war which has not much more than been touched upon, and that is the effect upon the price of securities. It would seem as though, in the realm of bonds, we had seen good grade bonds at about as high a price level and as low an interest rate as we will ever witness and it would seem the only direction in which bond levels could proceed would be downward and that there might be some increase in the interest rate. However, I was talking this morning with our investment secretary and he was quite definitely of the opinion that, due to the

vast hoard of gold which exists in this country and which is the main factor in determining interest rates, and the fact that we might see an increase in the amount of that gold rather than otherwise, there was not much likelihood of an increase in interest rates, although of course we must recognize that the continuance of the war over a long period of time might bring about inflation in spite of the fact of the existence of this gold.

We are all deeply concerned as to the long term effects of this war not only upon casualty insurance but upon our entire business, social and political economy. In this connection, it is illuminating to read the recent report to the stockholders of one of our largest automobile manufacturing companies which contains the following statement:

"The belief that war is a profitable enterprise is entirely without any basis of fact. It is true, as has already been stated, that it causes a temporary stimulation of activity. It requires the most intensive effort on the part of the productive plants of those who are involved, and in the world of to-day, closely integrated as it is economically, even those who may not be directly involved like ourselves are necessarily importantly affected. But irrespective of all the facts and circumstances, all ultimately lose. The destruction of wealth can never, in the final analysis, lead to a better order of things; a lower standard of living must result. Years of readjustment necessarily follow the declaration of peace."

"In other words, there must inevitably be an accounting; a price must be paid in some form or other. As applied to our domestic problems, the present emergency is most unfortunate from the standpoint of our long-range economic position for the reason that it lulls us into a feeling of false security. The facts are—and they must be faced, sooner or later—that the economic policies which have so prejudiced our progress and stability still remain, and in the inevitable final accounting the aftermaths of the present emergencies are bound to reassert themselves in exaggerated form."

REVIEWS OF PUBLICATIONS

CLARENCE A. KULP, BOOK REVIEW EDITOR

Administering Unemployment Compensation. R. Clyde White. University of Chicago Press, 1939. Pp. 312.

The author, who is Professor of Social Service Administration at the University of Chicago, assisted in drafting the Indiana unemployment compensation law and served for 6 months as a member of the staff of the Indiana Unemployment Compensation Division. He personally observed many phases of the administration of unemployment benefits in Great Britain and in Germany.

As an introduction and to give background the author describes and discusses the British and German unemployment insurance laws, the fundamental philosophy underlying each, the organization of the administrative machinery and their practical operation.

Originally the apparent objective of the British law was to build up funds in periods of prosperity to tide workers over periods of depression, that is to protect the worker against cyclical unemployment. At a later stage it was regarded as a partial means of dealing with the relief problem. The final viewpoint is the same as that of unemployment insurance in the United States, that it is a means of protecting the workers' standard of living during periods of temporary unemployment occurring at any time during the business cycle.

In Germany the conception of the function of unemployment insurance differs sharply from those current in Great Britain and the United States. Under the German law contributions may be used not only for payment of cash benefits as a matter of right, but also to pay for cash or work relief, employment service and vocational guidance.

The author proceeds to a discussion of state unemployment compensation acts in the United States. These are discussed under the headings of coverage, contributions, benefits, employment service, financial administration, personnel and complaints and adjudication. Under each topic British and German practices are given in considerable detail, with helpful tables, for comparison and orientation. One soon gets the impression that the state acts are often needlessly complicated and clumsy.

Obviously a large amount of intelligent, hard work has gone

into the preparation of this work. Unemployment compensation administration in the United States is still largely in the "shake-down" stage though, and the value of the work will therefore be temporary in many respects. It should be of considerable value in giving perspective to persons connected with the administration of unemployment compensation but others probably will find it too heavy reading.

J. B. GLENN.

Economic Aspects of Medical Services with Special Reference to Conditions in California. Paul A. Dodd and E. F. Penrose. Graphic Arts Press, Inc., Washington, D. C., 1939. Pp. 499.

This book of 500 pages written by two economists deals with the problem of medical services in California from the quantitative rather than the qualitative angle. It covers the years 1933-34. The purposes of the study were in the main to ascertain the amount paid by various classes of income-receivers in California for medical and dental care, to determine the ability of various income groups to pay for health and dental services and secure adequate medical and dental care, and to determine the trend of professional incomes since 1929.

Information was compiled by investigators who visited 21,000 families comprising over 65,000 persons. Although they composed less than 2 per cent of the population, they came from 26 counties and the authors aimed at obtaining a representative sample. In addition schedules were sent to every registered physician, dentist, osteopath, hospital and clinic in the state; and a very substantial number were returned completed. Another 26,000 general schedules were sent to selected families. These data were analyzed in great detail and the results presented in 142 tables and 57 charts. After this quantitative review the authors add chapters on the public health situation in California, health insurance and their conclusions and recommendations.

The authors believe that the survey refutes the oft-repeated statement that "two classes of people obtain adequate medical service: the very rich who can pay for what they need, and the very poor who get it free." They hold that the facts show that "the need for medical services . . . varies inversely with family income. . . . The relationship between those who *receive* treatment

needed and those who *need* treatment varies inversely with family income. . . ."

Their review of the evidence brought them to the conclusion that:

> Advances in medical techniques have not been accompanied by corresponding advances in the organization of medical services, with the result that many suffer unnecessarily and die prematurely whose sufferings could be avoided and lives prolonged merely by the more widespread application of existing knowledge and resources.

The chapter on health insurance deals with the underlying principles, the various types of voluntary insurance, the distinction between the private and social approach to this insurance and the administrative problems involved. The authors believe that "The conclusions to be drawn from this analysis point toward a plan of compulsory health insurance as the most effective immediate way of meeting the need for medical care in the state." Only a very small proportion of the people are now covered by all the voluntary forms of health insurance combined. Experience has shown that those who need protection most are least likely to secure it.

The authors outline the essentials of a compulsory health insurance program. They would include workers earning more than $500 and less than $2,400 or $3,000 a year. The plan is to be financed through compulsory contributions (a set percentage of wages or salary) levied on employers and employees, together with a contribution from the state.

Benefits should include "such services of physicians, surgeons, and dentists as are necessary to prevent serious damage to the public, and such auxiliary services of optometrists, nurses, hospitals and the like as are reasonably necessary to the protection of the public interest." Cash benefits during illness, equal in amount to those granted under the Unemployment Insurance Act, should also be paid. Eligibility would depend upon the certification of a physician. Dependents should be covered for medical benefits. Doctors and other medical personnel should be adequately remunerated. Machinery should be devised to supervise the quality of the service rendered.

The plan should be administered by a Director of Health Insurance assisted by an Advisory Council composed of representatives

of employers, employees, doctors and voluntary social agencies serving without salary. On the other hand, medical matters should be entirely under the control of the medical profession.

A "committee of leading actuaries" should be appointed to make "detailed recommendations" regarding the financial structure. In the last analysis, the rate of payment and the benefits that can be granted are held to depend on the age and sex distribution of the population, occupation, the frequency of illness, the costs of administration and the size of the reserve deemed desirable.

JAMES D. CRAIG.*

* Prepared with assistance of Fred S. Jahn.

Essentials of Workmen's Compensation Insurance. Clarence W. Hobbs. The Spectator, 1939. Pp. 261.

The *Essentials of Workmen's Compensation Insurance* includes under the general heading *Workmen's Compensation Insurance* the following subject headings: *Insurance Companies and Their Organization, The Selling Organization, The Course of a Workmen's Compensation Insurance Policy, Compensation Rates and Rate Making, Rating Procedure, Standard Workmen's Compensation and Employers' Liability Policy, State Endorsements, Special Forms and Endorsements, Reinsurance and Other Loss-Sharing Contracts.* It is an act of courage to attempt to put in permanent form the rapidly changing procedures of compensation insurance. Mr. Hobbs has turned the stop motion picture method on 1939 and the future value of his book will depend on how static the business remains. For the present insurance solicitors and students will find it extremely useful.

I have no doubt at all as to the accuracy of the descriptions of methods and forms in the National Council states—in any event I am not sufficiently acquainted with the detail of operation in these states to enable me to criticize the book from this angle. Regarding Pennsylvania and Delaware, however, candor requires that I call attention to the fact that there are inaccuracies and to the fact that an entirely different method of experience reporting, rate derivation and system of manual classes is in use, bearing in mind that Mr. Hobbs states in his conclusion that state manuals

and company practices may differ in detail from the descriptions of practices in this book.

Attention should be called to the use, or rather misuse, of the word "casual" in connection with experience rating and the occurrence of death and permanent injury. On page 113 Mr. Hobbs says, "The reason for setting a limit is, that below a certain point, experience is so highly casual . . . ," and on page 115, "Death and permanent total cases are reported . . . at the average values. . . . This is because such losses are highly casual." The accepted definition of the word casual is "fortuitous, by chance," yet a risk of this average size ($200 premium per annum) may expect one compensable temporary disability case every second year and one serious case every 40 years, and the experience is not properly described as "casual" unless it departs markedly from expectation through the absence of accidents or the occurrence of an excessive number of them. It would seem therefore that the word should be "expected" rather than "casual."

In the discussion of reserves and surplus there is an omission of one rather important item. No mention is made of guarantee funds by which stock and participating companies, under legislation requiring a small addition to premiums, guarantee the solvency of their respective members.

Under the heading *Rejected Risks* some 9 reasons are given for the need of an "assigned risk" program. These reasons are all risk shortcomings; i.e., the risk refuses to cooperate, has a high catastrophe hazard, has a bad record respecting premium payments, etc. As a matter of fact, the close approach of the loss ratios of assigned risks in several states to the state loss ratio indicates that the difficulty in securing insurance is not necessarily due to inherent defects in the risks assigned.

In conclusion there may be some justifiable disagreement over the title of this volume, *Essentials of Workmen's Compensation Insurance*. Essentials, it would seem, should deal with the nature or purpose of insurance, should discuss the characteristics of compensation risks, should go further and engage in a discussion of the magnitude and the social nature of workmen's compensation. This is a volume of method and of detail of the practices of insurance companies and of administrative bodies and bureaus, as well

as of state departments. Would not a better title be *A Handbook of Compensation Insurance Practices?*

GREGORY C. KELLY.

Insurance. S. B. Ackerman. Revised Edition. The Ronald Press Company, New York, 1938. Pp. xiii, 599.
Questions and Problems. Same publisher and author. Pp. 145.

This is a revised edition of the author's original book published 10 years earlier. The aim of the book, as stated in the preface, is "to aid the buyer of insurance and the various people engaged in the service of insurance." Incidentally, apparently, the book is also intended for classroom use.

The first chapter consists of an elementary discussion of such diverse topics as the function of insurance, insurance rates, governmental supervision of insurance companies and certain provisions common to most kinds of insurance policies. Chapter 2 discusses the various ways in which insurance is beneficial to society. Then follow 21 chapters descriptive of the various classes of insurance starting with life, running through fire and allied lines, marine, the various casualty classes, title insurance and ending with fidelity and surety bonds. The general pattern of each chapter consists of a discussion of the need for the type of insurance which is the subject of the chapter; a description of the provisions and exclusions of each of the various policies available and special endorsements which may be purchased to meet special situations; and a brief description of the factors which determine premium charges. The concluding chapters deal with the following subjects: types of insurance carriers, underwriters' associations, organization and management of insurance companies, reinsurance, investments of insurance companies, state supervision and legal interpretation of the insurance contract. A separate pamphlet contains questions and problems for classroom use and for the benefit of persons preparing for state examinations for agents' licenses.

This book covers a wide range and in consequence must deal sketchily with many subjects. On the other hand, it sometimes seems to go into too much detail in itemizing policy provisions and exclusions. At least this would be a valid criticism were the

book designed for general reading. However it is pardonable, and doubtless necessary, in a text or reference book designed for insurance buyers and prospective brokers and agents who may require at least a slight acquaintance with the various coverages which may be obtained. As for college students, one wonders whether many of these details are not superfluous, and whether the student would not be better served if the text were confined to providing a broad background. The book does not deal with actuarial problems or the actuarial basis for insurance rates, since the author believes that these are not a subject of interest to the class of readers for whom the book is designed.

In the chapter on reinsurance, the subject with which the reviewer is most familiar and which chapter he accordingly read most critically, a number of inaccuracies are noted. For example, on page 519 it is stated that "The terms of a quota share treaty provide for a fixed participation of the reinsurance company in every risk accepted by the ceding company. Under the conditions of the treaty, the ceding company cedes a portion of every risk assumed, regardless of whether or not the amount is within the underwriting limit which it has set itself." In the casualty field at least the prevailing form of share reinsurance provides that the reinsurer assume on a share basis some or all of the surplus, *if any*, over the amount retained by the direct-writing carrier, the latter's retention being defined in the treaty either rigidly or subject to certain limitations which may permit the direct-writing carrier considerable flexibility in fixing its retention. Under this method of reinsurance many risks, indeed it may be most risks, will be retained in their entirety by the direct-writing carrier. Certainly this plan of reinsurance, often referred to as "surplus share" reinsurance, is by no means one wherein "the ceding company cedes a portion of every risk assumed, regardless of whether or not the amount is within the underwriting limit which it has set itself." Neither does this plan of reinsurance fall under the author's other classification of treaty reinsurance, "excess cover treaties," inasmuch as under excess treaties the reinsurer participates only in losses exceeding some specified amount, whereas under a share treaty the reinsurer participates on a share basis in every loss pertaining to any risk which is reinsured. In a chapter on reinsurance, two or three illustrations of the apportionment of

losses between carriers where reinsurance is involved should certainly be included so as to bring out the distinction between the excess and the share basis of reinsurance, a distinction which is not developed by the author.

HOWARD G. CRANE.

Law's Statistical Tables. Fire and Marine Insurance Companies for 1939. Harrison Law, Nutley, N. J. Pp. 30.

The 38th annual edition of these tables furnishes a great deal of statistical information gleaned from the 1938 and preceding financial statements of the 237 companies whose data are presented. The tables are typewritten and the reproduction by the photo-offset process has produced clean clear-cut copies. The 30 pages are of the same size as the convention blank and while the tables are not numbered there are an even dozen.

Brevity in the preparation of captions appears to be the watchword throughout. Very likely this publication goes almost exclusively to those who are familiar with the fire insurance statement and with similar publications of previous years and so know exactly what information is being presented, but as a matter of accuracy and adequacy the headings leave much to be desired. For instance the very first tabulation shows for each company the ratios of losses and various expenses to premiums but there is no general caption. Only by reading the 6 subheadings does one discover just what the scope of the table is. It is presumed that "premiums" is intended to mean written and not earned premiums but there is no explanatory note anywhere to enlighten one.

The next table is headed *Five Year Average* and we accordingly assume that the ratios given under the headings *Losses, Comm. & Agency Expense, Salaries, Taxes, Other Und. Disb.* and *Total Und. Disb.* are for the 5-year period 1934-1938 inclusive. One wonders why the second column in the first table is headed *Commissions,* in the second table *Commission & Agency Expenses.*

In the first table all companies are listed in alphabetical order while in all the remaining tables there is a division into 3 groups:

Companies
Foreign Companies
Reinsurance Companies

Without attempting to describe all the tabulations, it may be of interest to list some of the captions and briefly indicate the nature of the data:

Cancellations and Reinsurance

Gross Premiums Written and *Cancellations* for 1938 are shown and the ratio of the latter to the former; similarly *Net Premiums* and *Reinsurance* for each company. In this case the aggregate total of each group for 1938 and 1937 is given with resulting ratios.

Incurred Loss and Expense to Earned Premium

This table as the foreword states is a new feature. *Premiums Earned* and *Incurred Loss and Expense* with resulting ratios are given for each company but there are no totals nor combined average ratio. Judging from the size of the ratios it is assumed that the expense referred to is loss expense.

Unearned Premium Reserve to Premiums in Force

In this case amounts are shown and ratio of one to the other for each company but no totals are given for all companies.

Capital, Surplus, Unearned Premium and Insurance in Force

This tabulation contains no information regarding *insurance in force* but it does provide columns showing the liquidating value of each company and the par value and liquidating value of each share of stock.

Assets and Liabilities

Totals for each company are shown and the ratio of the latter to the former.

Premiums and Losses Since Organization or Admittance to U. S.

This is an interesting table. It discloses among other things that there are 19 domestic fire insurance companies that have been in business for over 100 years, that 7 companies have written premiums thus far with an aggregate of half a billion or more and that two companies have written over a billion in premiums.

Other tables furnish an *Analysis of Income* and an *Analysis of Disbursements* and a summary of *Specific Classes* of premiums written and losses paid. This latter table shows separately the results for 1938 of each of the 13 principal divisions of fire insur-

ance business. Last of all, there is a comparison of total results under each of these classes for 1938 and 1937.

In spite of the technical shortcomings of the set-up of some of these tables it cannot be gainsaid that a vast amount of comparative data has been assembled. While some of it may be of little utility, they for the most part undoubtedly furnish information desired by company executives not otherwise available.

H. O. VAN TUYL.

Life Insurance. Fifth Edition. Joseph B. Maclean. McGraw-Hill Book Company, Inc., New York and London, 1939. Pp. xii, 668.

A review of the Fourth Edition (1935) of this standard work appears in the *Proceedings*, Vol. XXII, p. 170. Every good word there spoken is richly deserved by the Fifth Edition, in which every chapter has been revised and brought up to date, certain chapters have been entirely rewritten and a new chapter entitled *Savings Bank Life Insurance* added. Fortunate indeed are the students of life insurance to have at their disposal a textbook so logical in its development of the subject, so clear in its exposition and so authoritative in every detail.

HENRY H. JACKSON.

Life Insurance Should be Supervised, Regulated and Governed by Law in the States. American Life Convention, Chicago, 1939. Pamphlet. Pp. 8.

This brief pamphlet serves to place the American Life Convention on record as opposed to federal supervision of the life insurance business, either by way of substitution for the present system of control by the states or in supplement thereto. With this attitude the writer has considerable sympathy; though he must most respectfully submit that certain parts of the argument adduced in support do not seem entirely convincing, especially that which seeks to prove the step unconstitutional. The constitutional issues have been ably discussed in a recent number of these *Proceedings* by Mr. Rainard B. Robbins and it may suffice to state that the Supreme Court as now constituted might very conceivably, if con-

fronted by a deliberate attempt of Congress to assume regulation of the insurance business, declare that the principle laid down in *Paul v. Virginia* is inconsistent with other decisions of the Court, and that dealing in insurance policies is commerce within the fair meaning of the commerce clause. That is of course purely speculative. As yet it is by no means certain that the T.N.E.C. will recommend such legislation or that Congress will adopt it if recommended. To wipe out at a stroke 48 state insurance departments, annul 48 codes of law and affect a change revolutionary in character in the supervision and in the conduct of a great business is a very radical step which, it is to be assumed, Congress would hesitate to take unless fully convinced of its necessity in the public interest. Up to date evidence of this necessity does not appear overwhelming. As a whole life insurance, and indeed insurance generally, is operated in a basis eminently sound, not merely by virtue of supervision but by the desire of the business itself to operate on stable and rational lines. The character of supervision which has existed is doubtless not perfect but it can fairly be said that it has been honest and reasonably thorough. Certainly the results exhibit a condition of the business that will bear comparison with that part of the banking or transportation business which is subject to federal regulation and control. It would be polite of course to assume that if the federal government undertook to regulate insurance it would use proper care to have the regulation done by an adequate and competent force. Even so, it may be questioned whether in point of adequacy and competence federal regulation would be better than that of the state departments.

So much can fairly be said on the merits of the point in issue. The pamphlet pays glowing tribute to the institution of life insurance as existing in these United States, and to its present lords and masters, which latter feature is far from unwelcome to an ex-Commissioner. It views with suspicion and alarm the methods and purposes of the T.N.E.C. in the conduct of the present investigation, and this, on the whole, is better left undiscussed. Not having had the privilege to follow closely and at first-hand the conduct of the investigation, the writer would not be justified in departing from that convenient and eminently polite maxim of the Courts, *omnia praesumitur rite esse acta.*

CLARENCE W. HOBBS.

The Manufacturer and Insurance. Lawrence S. Myers. The National Underwriter Company, Cincinnati, Ohio, 1939. Pp. xvii, 273.

The author of this volume is an officer of an insurance agency corporation representing numerous companies and transacting business over a wide area. The prevailing viewpoint, however, is that of the insurance underwriter rather than the insurance salesman and the book reflects a thorough knowledge of present-day insurance practice.

A brief statement appears in the preface setting forth the achievements of the manufacturer in molding a new civilization and indicating the extent to which our manifold commercial activities are dependent on the manufacturer. There follows an introductory chapter outlining the need for insurance, the development of an insurance program and a discussion of the selection of insurance companies and the actual writing of the insurance. The 3 major phases of insurance protection are set forth:

1. Indemnity for loss arising out of (a) damage to or destruction of property owned or in the custody of the insured, including also the loss of use; (b) burglary or robbery; (c) larceny or embezzlement; (d) check alteration or forgery; (e) liability for accidents to employes; (f) liability for accidents to members of the public; (g) liability for accidents, damage to or destruction of property belonging to members of the public; and (h) miscellaneous causes.
2. Investigation, handling and defense of liability and compensation claims.
3. Fire, accident and miscellaneous loss prevention.

In emphasizing the importance of establishing an insurance program it is pointed out that it is necessary to consider carefully the nature of the business and the perils to which it is exposed. The extent of the possible loss is held to afford a better criterion of the advisability of insurance than the question of frequency as full protection against small losses is not so essential while protection against even remote perils which may produce severe losses is very important.

The author very properly points out that in the selection of insurance companies the policyholder should be concerned with

loss-paying ability not only throughout the life of the policy but during the entire period that claims may be payable and in compensation cases this often covers a long term of years. There are suggestions for determining the adequacy of reserves appearing in the statement of an insurance company. It is likewise pointed out that the ability to furnish loss prevention and claim service is a matter that should not be overlooked. The author stresses the importance of the writing of the insurance in a manner that will afford broad and flexible coverage. It is likewise emphasized that best results can usually be achieved through the centralization of insurance through one agent or broker.

This book is written in the ordinary language of the insurance business and in discussing coverage the customary terms are used to describe the various features of coverage and endorsements. From the standpoint of the insurance agent and general insurance man as well as a student of the business this is a practical and commendable feature.

The major portion of the book has to do with fire insurance and allied lines. Of the 8 parts into which the book is divided, Part I has to do with *Fire and Collateral Lines,* Part II with *Loss of Use,* Part III with *Inland Marine Lines and Ocean Cargo.* These cover the first 155 pages of the text. The remainder of the book is given to a description of boiler and machinery lines, burglary and robbery insurance, fidelity bonds and check forgery and alteration insurance, liability insurance and miscellaneous lines. The final chapter is devoted to a brief description of fire, accident and miscellaneous loss prevention and the importance of the full cooperation of the management in a safety program is stressed.

This book furnishes a carefully prepared description of the insurance coverages needed by large manufacturing establishments and the manner in which these coverages are afforded in policies in use to-day. In certain cases a complete policy form is set forth as a part of the text and sometimes the full wording of an endorsement is given but the book does not fall into the error of being a dry collection of forms. It is descriptive throughout and written in a manner to hold the interest of the reader.

This book should be of real value to the student of insurance and insurance buyers as well as those in insurance offices through-

out the country who are engaged in furnishing insurance to meet the manifold needs of modern American industry.

H. O. VAN TUYL.

Old-Age Security: Social and Financial Trends. Margaret Grant. Committee on Social Security, Social Science Research Council, Washington, 1939. Pp. 255.

This report, another in the Social Science Research Council series on various phases of social insurance, is a most valuable addition to the growing field of social security literature. As the title indicates the book covers a very broad field and does it extremely well in such a short space. The material dealt with is primarily that of various major foreign social insurance systems with some discussion as to their applicability to American problems. The report is perhaps more valuable in the provision of useful information on benefit provisions and operating statistics of various foreign programs than in the discussion of their applicability to our program. It perhaps might be said that the report is a comprehensive source-book on the major foreign old-age insurance systems. The various data gathered together are vital in any consideration of social security and it is extremely helpful to have them brought together in a uniform fashion.

The author has organized her material very well into 7 chapters. The first deals with the general reasons for providing old-age security and the different methods adopted in various countries. The second describes in detail the nature and historical development of non-contributory pension systems in 4 major countries, while the third chapter deals in a similar fashion with contributory old-age insurance in certain other nations. In Chapters 2 and 3 analyses of costs are made for many years, showing the number of beneficiaries, average benefits and benefit expenditures as related to various pertinent factors. In many instances a most interesting analysis is made of the size of average payments as compared to the cost of living so as to indicate whether amendments were made in order to keep up with rising cost of living or to provide relatively more favorably for the beneficiaries. The fourth chapter continues the analysis of contributory old-age in-

surance by discussing the various theoretical methods of financing as contrasted to the methods actually used. A most excellent discussion of the different types of reserves is given on pages 151-166. The fifth chapter discusses old-age costs as related to other national expenditures, a most difficult task due to the sparseness of homogeneous data. The sixth chapter presents a somewhat brief analysis of the effect of population trends on social security systems. Although the discussion here is brief, and in some cases slightly incomplete, it is nevertheless of appreciable value in bringing to the mind of the layman the important effect of population trends. Finally the seventh chapter discusses foreign experience as related to American problems. This chapter, which covers only about one-eighth of the book, might perhaps be said to be the main chapter towards which all others merely serve as introduction and background. The steps taken in setting up the Social Security Act are briefly compared with what other countries have done and unusual differences are noted.

Perhaps, when the great majority of the reviewer's impressions are so favorable, it is hardly worth-while taking up several minor adverse criticisms. However the reviewer believes that the discussion of reserves under the present Swedish system is not completely accurate. In brief, Sweden, in taking in more money as contributions than is paid out currently in benefits under its contributory system, does not issue bonds or other notes of obligation against the great majority of such excess. In subsequent years this "theft" is "atoned for" by the payment of a government subsidy. The effect is of course the same as though interest were being paid on the "unissued" bonds. This it seems constitutes poor accounting since the reserve is really there (large reserves resulting from excess of contributions over benefits cannot be legislated away by the "ostrich" method). Therefore the Swedish system does not seem to be a combination of current cost and reserve basis (with the former predominant) but rather to be almost completely on a reserve basis. One further criticism lies in the brief treatment of the 1939 amendments which omits several somewhat vital points such as the payment of lump-sum death benefits in certain cases.

ROBERT J. MYERS.

Premiums for Life Assurances and Annuities. J. H. Gunlake. *The Treatment of Extra Risks.* C. F. Wood. The University Press, Cambridge (The Macmillan Company, New York), 1939. Pp. xi, 126 and 71.

In any profession the accumulation of knowledge from decade to decade is alarming. In consequence the student of to-day must know more than did his predecessor of a few years ago, and his successors will in turn be confronted with increasing masses of material. The problem of the actuarial student is no exception. Fortunately, however, certain basic principles in any science remain steadfast and accumulating experience and changes in practices can be condensed from time to time to the vast advantage of the student body. The *Journal of the Institute of Actuaries Students' Society* was established in London nearly 30 years ago in practical recognition of this educational problem and successive volumes have done much toward its solution. Thus in the second number (1912) a brief abstract of a paper on office premiums will be found, while a special pamphlet relating to extra risks was published by the Society in 1915.

Certain actuarial subjects, however, are so fundamental in nature and so extensive is the literature involved that a book rather than a pamphlet is required for proper presentation. In recognition of this fact the *Consolidation of Reading Series* was established by the Students' Society and very happily inaugurated by the publication of Lochhead's *Valuation and Surplus* in 1932.

The book under review is another happy example of this series. For actuarial students in Great Britain such a publication is comparable in significance to a new volume of *Actuarial Studies* published for students on this continent by the Actuarial Society of America. In this case the conveniently arranged text falls into two distinct sections under separate authorship. The first part, dealing with office premiums for standard risks, is roughly twice the length of the second part, devoted to the treatment of extra risks. Each section is complete in itself, and, in the judgment of one who has never had practical experience in a British office, each constitutes a satisfying exposition for the actuarial student.

The Editor's *Foreword* clearly indicates the object of both authors to be the presentation of the underlying principles and other

relevant considerations. Consequently 3 of the 8 chapters in Mr. Gunlake's section are devoted to the general nature of the problem of net premiums. The respective titles are, *First Principles: The Nature of the Problem, Mortality* and *Interest.* The first two chapters in the second section are likewise thoroughly general, as the titles, *The Existence of Extra Risks* and *The Theory of Extra Risks,* clearly suggest. Following these introductory chapters, excellent both in conciseness and suggestiveness, the authors proceed to examine and explain with reasonable historical perspective the practical considerations involved in the computation of office premiums for standard risks on the one hand and for sub-standard risks on the other. Chapter titles will sufficiently indicate the method of treatment: First section—Chapter IV, *Loadings;* Chapter V, *Minor Non-Participating Classes of Assurance;* Chapter VI, *Assurances Participating in Profits;* Chapter VII, *Industrial Assurance;* Chapter VIII, *Annuities: Staff Schemes: Miscellaneous Types of Business.* Second section—Chapter III, *Practical Methods of Giving Effect to Extra Risks;* Chapter IV, *Common Causes of Extra Risks;* Chapter V, *Miscellaneous.* Thus in a single volume the student is provided with a wealth of information relating to net premiums, office premiums, selection of risks and the treatment of under-average lives, in relation to every type of insurance and annuity contract with which he is likely to be concerned.

The actuarial student in America reading the volume—and, busy as he is, the student can well afford time to read it and to read Lochhead as well for a checking and revision of his own knowledge of basic principles—may gleefully skip the numerous references to the effect of the British income tax on various transactions. He will not fail to notice the general statement concerning the determination of the net premium: "There can be no question but that the select basis is generally, if not indeed always, the more correct," and to contrast it with the later statement: "At the present time roughly three-quarters of the British life offices use the simple and compound reversionary methods of bonus allocation" and with a reference "to the development of some elaborate methods of bonus distribution, more popular in America than in Britain, known as 'contribution' methods." The joke here appears to be that the participating premium in one country is computed

with rather special accuracy while surplus is distributed on the basis of rather broad averages, and in the other country practice tends toward something of a reversal of the two processes. Whether the joke is really on the American or the British actuaries this reviewer has never been able to ascertain.

Certainly no inference that the authors of the present textbook are either complacent or dogmatic should be permitted to stand. The entire book is admirably free from dogmatism. Perhaps completion of the first quotation will best indicate this fact:

> There can be no question but that the select basis is generally, if not indeed always, the more correct. But it is well to bear in mind that of the multitude of things affecting mortality—as age, selection by the office, sex, occupation, climate, residence, density of population, date of birth, diet, income, temperament, and numerous others—only the first two are taken into account in calculating premium-rates for the home prospectus, and it is not yet known whether they are the most important two.

It may possibly be objected that the numerical rating system, which undoubtedly constitutes a highly important scientific contribution to the whole problem of the selection of risks, whether standard or substandard, is inadequately appreciated by the paragraphs devoted to it in Mr. Wood's third chapter. Such a criticism would be unfair in view of the fact that British practice is here under discussion for the benefit of British actuarial students, and of this further fact, well stated by the author that: "Whatever system of rating is used, it is unlikely that the final results in individual cases will differ widely." The author is of course referring, as the context makes clear, only to systems founded on educated judgment. All actuarial science is based on, and gains its validity from very broad averages. For its purposes the individual exists only as one of a class. For its purposes all the problems of net premiums, office premiums, selection of risks and equity must be regarded from the point of view of broad averages and sweet reasonableness. Unselfishly, for the benefit of actuarial students, the joint authors of this important volume have presented this point of view.

HENRY H. JACKSON.

Social Insurance Coordination. C. A. Kulp. Committee on Social Security, Social Science Research Council, Washington, 1938. Pp. xiv, 333.

Professor Kulp's report on the coordination of social insurance is one of a series prepared for the Committee on Social Security by a group of well informed, thoughtful, hard-working research people. The whole series indicates one of the advantages which might accrue to countries entering the social insurance field a little late. Valuable reports of this nature can help in understanding this new function of government.

The author's discussion of social insurance organization deals with two countries of major importance in the history of social insurance, Germany and England.

One may wonder how an American could so well surmount the barrier of language and the burden of political caution in studying the German system. His report seems to show a unity, a coherence and a body of tradition in that well-established social insurance program where the facts of claim payment have more weight than mere opinion. In any event, few of us can authoritatively question his findings in this area.

As a "control" in reading the British portion of his report we have the authoritative, curtly prepared PEP report on the British social services. It appeared in print before the author had completely organized his material. It should be read here and there to develop further points which the author could hardly cover in quite so much detail. The two major "balances" in this report concern:

(1) The inter-relation of all forms of social insurance, including the various categorical forms of assistance;
(2) The division of administrative responsibility between local, regional and central authorities.

Naturally, during the years of establishing social insurance protection in the United States most of the published material has related to the type and scope of benefits payable, the sources and incidence of taxes to finance the program and since the savings bank approach was initially adopted, the reserves to be accumulated. The author terms these problems "actuarial-technical" and promptly turns to the "organizational" elements of social insurance.

In reading the report it seems well to recognize that the author's own introduction to social insurance had been largely from the workmen's compensation and unemployment insurance side rather than from the side of old-age and survivors insurance. He makes the casualty approach a sound one for the whole program and thus largely escapes the dilemma puzzling some life actuaries which is created by a savings bank method of accumulating reserves for deferred, generous old-age insurance benefits. Such provision is soundly recognized as a part of the more comprehensive program.

The author has adopted a well thought-out framework for the organization of his material. Thus in rapid sequence he discusses:

(1) The importance of coordination and the various ways of recognizing its absence;
(2) The relationship between coordination and centralization as evidenced by a rather minute examination of the systems of Great Britain and Germany to show their trend toward coordination and their present status, emphasizing the administrative difficulties in health insurance, unemployment insurance and relief.
(3) The application of this study to the American system, with careful warning against "lifting" too readily techniques which fit one system but not necessarily another.

The author might claim some of the virtues of a prophet since the 1939 amendments seem to have selected a retrospective method of fund accumulation in old-age and survivors insurance. Placing the trust fund under the direction of a Board of Trustees, again, divides the Treasury's responsibility with representatives of two other important government agencies. It might be said that the Treasury is the government agency most experienced in collecting taxes so that continuance of the performance of this duty may seem more logical to many than it does to the author. The discussion as to how unemployment compensation and employment service should be related has been resolved by coordinating them (within the Social Security Board) in the new Bureau of Employment Security.

The author's conclusion that unemployment insurance and relief are essentially political matters is not untrue but is possibly an oversimplification. His suggestion that health insurance should be adopted immediately on the thesis that otherwise the entire

program is not well-rounded thus runs into the paramount question of the political wisdom of establishing the remainder of the program before our reorientation has been more firmly established. There is a certain breathless quality in starting everything almost simultaneously which may well seem less desirable politically than to await a more adequate comprehension of the next step.

The reviewer feels constrained to add to the author's considerations of old age and survivors insurance record-keeping comments on the mechanical simplicity which has been rapidly developed in Baltimore so that, cumbersome as these records necessarily are, their cost continues to be a rather minor element of long-run expense. This country, by application of American ingenuity and resourcefulness, should be able to do a most effective job at this particular point. Due to the differentials of living costs by areas, both among the citizens as a whole and among those in covered employment, the relating of benefits to average wages, as determined by the 1939 amendments, seems for the moment the most generally satisfactory method. When the report was written the progress toward an insurance, and away from a banking benefit was not yet quite obvious.

The author is to be congratulated for his typically American willingness to tackle an extremely difficult problem and to handle it with balance, discretion and intelligence.

W. R. WILLIAMSON.

Sources and Extent of Liability of a Public Accountant. William R. MacMillan.

Includes also: *Civil Liabilities of Accountants under the Securities Act.* Wiley Daniel Rich. American Surety Company of New York, New York, 1938. Pamphlet. Pp. 27.

Sources and Extent of Liability of a Public Accountant is a reprint of an article which appeared originally in the Chicago-Kent *Review* and subsequently in the *Journal of Accountancy*. The subject matter of this article should be of interest to casualty actuaries for several reasons. In the first place, insurance companies from time to time retain public accountants to audit their accounts and therefore have the same general interest as other

types of business in the subject of public accountants' liability for negligence. In addition companies engaged in the bonding field may have valuable subrogation rights against public accountants, where claim payments have been required which might have been avoided or minimized but for negligence, or fraud, on the part of the accountants. As for actuaries in the consulting field they are interested in this subject because it would seem that they would have much the same liability as public accountants. A further basis for interest is the fact that insurance against accountants' liability is written on a limited scale by a few casualty companies.

Unfortunately the extent to which a public accountant is liable for failure to portray through the audit report the true financial position of the subject is not definitely established. The reported cases in this country bearing directly on the point are few. In general a public accountant is required to perform in a skillful manner and to exercise reasonable care and skill and he is liable for negligence, bad faith or dishonesty. However, what constitutes reasonable care and skill depends on the facts in the individual case. The author cites numerous cases in his endeavor to bring out guiding legal principles. To involve actionable negligence there must be a duty on the part of the accountant to the plaintiff, which duty the accountant has failed to perform with consequent injury to the plaintiff. Inasmuch as a duty to the injured party is essential, liability is ordinarily only to the public accountant's employer, although from analogous cases in other fields it is possible that where an audit was made for the particular benefit of a third party, and the auditor knew this to be the case, the auditor would be liable to the third party for negligence. In contrast to liability for negligence an accountant may be held responsible for fraudulent misrepresentation even to remote users of his statements, with whom there is no privity of contract.

Under the Securities Act of 1933 the accountant has been made liable to third-party investors in general for innocent but negligent misrepresentation as well as for fraud, where such misrepresentation occurs in the financial statements accompanying registration statements filed with the Securities and Exchange Commission. *Civil Liability of Accountants under the Securities Act,* a reprint of an article which previously appeared in the *Journal*

of Accountancy, interprets the liability features of the Securities Act. This is a subject on which there have been no court decisions, at least not at the time this article appeared.

As the result of the sensational disclosures last year in the case of a well-known manufacturer of pharmaceutical supplies where there had been substantial overstatement of assets, a great deal of attention has been focused on the subject of the extent of responsibility of public accountants. It seems probable that a greater degree of responsibility will be expected in the future and this will doubtless be reflected in court decisions.

HOWARD G. CRANE.

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Practical Underwriters Guide. M. E. Bulske. Rough Notes, Indianapolis, 1939.

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CURRENT NOTES

THOMAS O. CARLSON, CURRENT NOTES EDITOR

AUTOMOBILE

Medical Payments Coverage

The latter half of the year witnessed the general introduction of automobile medical payments coverage to be afforded under a liability policy on a private passenger car. The coverage provides for payment of all medical expenses and, in the event of resulting death, of funeral expenses up to specified limits to each person who sustains bodily injury while in or upon, entering or alighting from the insured automobile. The named insured is not covered. A release is not required. Limits of $250 or $500 per person are available. Rates are calculated as percentages of the standard limits classification rate for the bodily injury policy, with specific minimum and maximum premiums. An alternative form, written at lower rates, provides coverage subject to execution of a signed release of liability by the injured person.

Rate Revision

The trend of liability rates for automobiles is still downwards, the rate level being increased in only one state out of the ten in which revisions have been made in the last six months. The most important revisions were in New York where rates for private cars were reduced an average of 9.6% on September 1 and rates for commercial cars were reduced 8.5% on December 31. With the September 1 revision the Private Passenger Automobile Rating Plan which has been previously reviewed in these Notes was made effective in New York with differentials of 10% for Class A and 15% for Class A-1. This plan is now effective in all but six states.

BURGLARY

Broadening of Coverage

The coverage under the standard Interior, Messenger and Paymaster Robbery policies has been extended to cover twenty-four hours daily without additional premium, as compared with the

previous coverage from 7 A. M. to 12 Midnight on the Interior and from 7 A. M. to 7 P. M. on the Messenger and Paymaster Robbery policies.

The standard Interior and Paymaster Robbery policies have been extended to include kidnaping coverage without additional premium.

The standard Interior Robbery policy has been extended to include show window insurance covering merchandise when the premises are open for business, without additional premium.

Rate Changes

Recent territorial changes for the Mercantile Safe, and Interior, Messenger and Paymaster Robbery coverages resulted in slight reductions in the countrywide rate levels. The basic rate tables have not been revised recently.

GLASS

Broadening of Coverage

The standard policy has been extended to include coverage for damage to glass caused by acids or chemicals, the 25% additional charge for such coverage being eliminated.

A further extension provides for insurance covering (1) the cost of repairing or replacing window sashes, (2) the cost of removing and replacing any fixtures or other obstructions except show window displays and (3) the cost of boarding up, or installing temporary plates in the windows insured, to the extent of $75 for each coverage with a limit of $150 on all three coverages as respects a loss due to one occurrence. Such coverage may be increased for additional charges.

Rate Changes

Territorial revisions during the year have resulted in a slight reduction in the countrywide rate level.

WORKMEN'S COMPENSATION

Multi-Split Experience Rating Plan

After many months of study of various suggestions for improving and simplifying the existing experience rating procedure, the

National Council on Compensation Insurance has developed a Multi-Split Experience Rating Plan which is generally conceded to include innovations which are in theory at least definitely superior to the corresponding provisions in the present plan. The practical advantages of the new plan are somewhat more debatable. In view of the disadvantages of having the existing plan superseded in a limited number of jurisdictions, it has been submitted to supervisory authorities for their consideration with the understanding that it will not be made effective in any state until it has been approved in two-thirds of those states where approval is necessary.

There is not space here to do more than to indicate the chief differences between the two plans, and it is to be expected that in the event the new plan is widely used a paper will appear in the *Proceedings* to do the whole plan justice. The feature which gives the plan its name relates to the treatment of losses and the determination of credibility: the principles underlying this treatment of losses and credibility are set forth in the paper by Mr. F. S. Perryman in Volume XXIV of the *Proceedings*.

States would be divided into three groups on the basis of distribution of losses by size. Those states with the greatest preponderance of losses in the lower size groups would qualify for rating with $300 annual premium, the next group with $400, and the third group with $500.

Every loss is divided into $300, $400 or $500 units according to the premium qualification: all of the first unit of each loss is included in the "primary" portion, two-thirds of the second unit, four-ninths of the third unit, and so on in geometric progression, the maximum "primary" loss being in consequence equal to three times the smallest annual premium subject to rating. The remaining losses, not "primary," are "excess." Expected losses are calculated by application of tabular pure premiums to the classification exposures for the respective years and are then divided into "primary" and "excess" by factors varying by classification. The comparisons of primary actual and expected losses and of excess actual and expected losses are analogous to the comparisons of normal and excess losses, actual and expected, under the present plan. The credibility for the excess portion is zero for a wide range of small risks, so that for this group of risks which

constitute the bulk of the ratings in number the rating procedure is simplified to the use of the formula

$$\frac{\text{actual primary losses} + B}{\text{expected primary losses} + B},$$

where B is a credibility constant. The formula for the larger risks varies the B-value by size of risk, and adds to the numerator the actual excess losses multiplied by a variable W and to the denominator the expected excess losses multiplied by W. The values, B and W, by means of which credibility is introduced, are obtained from tables. The B-value is constant and the W-value equal to zero for risks on which the total expected losses are not greater than twice the average death and permanent total value. Self-rating is attained when the total expected losses equal twenty times the average death and permanent total value.

The five-year period with weights would be replaced by a three-year period without weights, making the plan more responsive to current conditions.

Further simplification is obtained by combining medical and indemnity losses for rating purposes.

The credibility values have been so calculated as to produce the same average modifications for all risks combined as those produced by the present plan, although individual ratings can, of course, be markedly affected.

Retrospective Rating Plan

A supplement to the Retrospective Rating Plan, providing for an alternative procedure in the rating of long-term construction risks, has been made effective in many jurisdictions. This alternative procedure permits the retrospective premium adjustment to be based exclusively upon the assured's experience in connection with a specific construction contract, even though the operations cover more than a year, provided the entire project is insured with one carrier. For eligibility and rating requirements the basic, minimum and maximum retrospective premiums are based upon the standard premium for the entire period covered by the long-term contract.

The application of the original plan has been extended to Colo-

rado, Minnesota and Wisconsin in the last half of 1939. In Minnesota, the plan is applicable only on an intra-state basis, but is available to risks with an annual premium of $300 or more. The plan is now applicable in thirty-two jurisdictions. Major changes of recent date include the elimination of July 1, 1939 of the rule requiring the advance collection of a part of the maximum retrospective premium surcharge, the lowering of the eligibility point generally to $1,000 annual premium, and the graduation of rating values beyond $150,000 to the $500,000 premium point; the two latter changes are currently being introduced.

Legislation

Although benefit provisions were revised in several states, in only five was the effect on the benefit level greater than 1%:

California	+ 1.6%
Illinois	+ 6.1%
New Hampshire	+ 8.3%
Pennsylvania	(see below)
South Dakota	+ 2.9%

In Pennsylvania, the increases remarked upon in Current Notes, Volume XXIV, page 200, were virtually eliminated, the reduction in benefit level consequently being in the neighborhood of 40%.

In Idaho and Maryland, occupational diseases have been brought under the compensation law. The Massachusetts law was amended to provide for a graduated scale of silicosis benefits.

Rate Revision

Indications point to the probability that a turning-point has been reached in the downward trend of loss ratios. Rate levels were increased during the year in twelve jurisdictions, and reduced in twenty-five; but of the twenty-five jurisdictions in which reductions were made, in only five did the reductions exceed 10%, and in nine the reductions were less than 5%.

A general revision is currently being made in the occupational disease rates, the level of the specific hazard classifications being reduced approximately 25%.

AUTOMOBILE

Statutory Automobile Rating Bureau

A new rating bureau, known as the Statutory Automobile Rating Bureau, has been established in New York for the servicing of four mutual and two stock carriers that specialize in the writing of statutory coverage, particularly on public automobiles. Mr. Richard Fondiller has been engaged as consulting actuary. The new bureau will cooperate with the two major rating organizations in the determination of rates for public automobiles in New York.

PERSONAL NOTES

James M. Cahill has been advanced to Actuary of the Compensation Insurance Rating Board.

John W. Carleton is now connected with the State Compensation Insurance Fund, San Francisco, Cal.

Raymond V. Carpenter has retired as senior actuary of the Metropolitan Life Insurance Company.

James D. Craig has retired as vice-president of the Metropolitan Life Insurance Company.

Robert S. Hull is now in the Unemployment Compensation Division of the Social Security Board.

Earl O. Dunlap was appointed third vice-president of the Metropolitan Life Insurance Company.

Gilbert W. Fitzhugh has been appointed assistant actuary of the Metropolitan Life Insurance Company.

Frederick L. Hoffman is now in San Diego, Cal.

Miss Elsie Kardonsky has been made Statistician of the Compensation Insurance Rating Board.

Thomas M. Oberhaus has resigned from the Mutual Life Insurance Company to become affiliated with Woodward and Fondiller, Consulting Actuaries.

Sanford B. Perkins has been made secretary of the Travelers Insurance Company in charge of research and rating in the compensation and liability department.

Harry V. Williams is now connected with the Hartford Accident and Indemnity Company at Hartford.

Austin F. Allen has been elected president and general manager of the Texas Employers Insurance Association and the Employers Casualty Company.

James M. Bugbee has been promoted to assistant manager of the Automobile Department of the Maryland Casualty Company.

Leo D. Cavanaugh has been elected president of the Federal Life Insurance Company of Chicago, Ill.

Stuart F. Conrod has been advanced to actuary of the Loyal Protective Life Insurance Company.

Malvin E. Davis has been appointed associate actuary of the Metropolitan Life Insurance Company.

H. E. Economidy has been advanced to vice-president and comptroller of the United Employers Casualty Company.

William Lassow is now statistician of the Board of Transportation of the City of New York.

George A. Cowee has resigned as an Associate.

LEGAL NOTES

BY
SAUL B. ACKERMAN
(OF THE NEW YORK BAR)

ACCIDENT—PROXIMATE CAUSE

[Police & Firemen's Ins. Assn. *vs.* Blunk (20 N.E. 2d, 660).]

This is an action on an accident policy. The insured was a member of a fire department. During his employment as a fireman his general health was good and he had worked continuously on a 24-hour shift. On February 25, 1936 he and other firemen in response to a call went to a burning building. Upon arriving they kicked in the back door. They then entered the house and encountered a fire caused by the explosion of a coal oil stove.

The smoke was of greater density and of a much higher temperature than is usual or ordinary in a burning building. The smoke was black, heavy, and hot. Shortly after entering the house, the insured emerged, holding his throat, and staggered to a nearby fence or building, and there he was observed by a fellow-workman gasping for breath and perspiring profusely. He was assisted to a chair in the front part of the house where he sat in a state of collapse. In a few minutes he was taken to the hospital where he died shortly afterwards.

Suit was commenced under the policy but the company denied liability. The policy provided that the company was liable if the accident was caused through external violent and accidental means independently of all other causes. In addition, the policy provided that the company was not liable so far as accidental injury is concerned if it happened directly or indirectly in consequence of disease or to any death or disability which may have been caused wholly or in part by mental or bodily infirmities or disease. The insurance company claimed that the deceased suffered from a disease of the heart at the time of the accident. The company contended, therefore, that if there was any disease present even though there was an accident the company was not responsible and demanded a directed verdict in its favor.

The testimony of the medical witnesses was susceptible to the

interpretation that if it were not for the accident, the insured would not have died at the time from coronary occlusion.

What was the company's liability?

The court decided that it has been held in similar cases where the liability of the insured was limited to bodily injuries effected through external, violent and purely accidental causes—such injuries as shall solely and independently of all other causes, necessarily result in death within a limited time,—that the causes referred to relate to proximate and not remote causes; and furthermore, that when more than one cause contributed to an injury, and if there was doubt, or if the facts were such that equally prudent persons would draw different conclusions therefrom, the question as to which of the contributing causes was the efficient, dominant, proximate cause, was a question for the jury.

The testimony of the medical witnesses was susceptible to the interpretation that if it were not for the accident, the insured would not have died at the time from coronary occlusion. It is true that in a strict or literal sense any departure from an ideal or perfect state of health is a disease, defect or an infirmity. But it is not every defect or infirmity of the insured that is contemplated by the parties in attempting to define the chain of causation, for to so hold would make the contract an absurdity.

The coronary occlusion in the manner in which it appeared was a disease within the meaning of the policy and as contemplated by the parties.

There was sufficient evidence under proper instructions to submit the question of whether the insured's death was the result of the accident, to the exclusion of all other causes, and there was no error in refusing to direct a verdict for the insurance company.

Automobile Insurance—Employees

[Johnson et al. *vs.* Aetna Casualty & Surety Co. (104 F. 2d, 22).]

This action involved a suit on an automobile bodily injury insurance policy. One Frank Green carried a policy of liability insurance on a truck used in his sawmill business. He lived at Norwood, Georgia, but his sawmill was located about forty miles away in South Carolina. He customarily took with him in the truck each Monday morning the sawmill hands who lived near his

home, and brought them back Saturday afternoon. They would be paid off at Green's office in Augusta, Georgia, on the way home. On Saturday afternoon, April 23, 1938, Green was returning homeward in the truck with certain sawmill hands, including Willie Johnson, Willie Radford and Elvin Green, the latter driving the truck. About nine miles from the mill and in South Carolina the truck collided with another truck, and Johnson was killed and Radford injured. Suits were threatened against Frank Green and Elvin Green, and called on the insurance company to defend. The company contended that its policy did not cover the cases.

The evidence was uncontradicted that work at the sawmill ceased on this Saturday as on other Saturdays at noon, that the "time" of each man for the week was ascertained, and their money was to be paid at Augusta on the way home. Johnson, however, was overdrawn and no money was coming to him. The collision occurred before reaching Augusta.

The transportation to and from the mill was not expressly a term of the hiring of the hands, but had been afforded for several years, and it was understood that they could ride if present when the truck started.

What were the rights of the company?

The court held that transportation was an implied term of the employment. The distance from the homes of the men to their work was so great that transportation must have been considered by both employer and employee. The ride was not for the mere convenience of the employee after his work was done, but was for the forwarding of the employer's work in that it was necessarily provided to get these employees for the very moderate wages paid them. No one would doubt that to carry them forty miles to work on Monday was forwarding the sawmill enterprise, or would think the employer had discharged his obligations if he had left them in the woods forty miles from home on Saturday. It has often been held that employees riding free to and from their work in the employer's vehicle continue to be employees and are not passengers.

Since Johnson and Radford were when injured by the operation of the truck still employees of Frank Green, the policy clearly does not protect Green, for: "This policy does not apply * * *

(e) to bodily injury or to death of any employee of the insured while engaged in the business of the insured * * * or to any obligation for which the insured may be held liable under any workmen's compensation law."

It was claimed that Elvin Green was protected by the policy because he was using the truck "commercially," that is in Frank Green's business, and by the latter's permission. Unquestionably the truck was so used. The policy provision applicable is: "IV. Definition of Insured. The unqualified word 'Insured' wherever used includes not only the named insured but also any person while using the automobile * * * provided that the declared and actual use of the automobile is * * * commercial, as defined herein, and provided further the actual use is with the permission of the named insured. The provisions of this paragraph do not apply * * * (d) to any employee of an insured with respect to any action brought against said employee because of bodily injury or death of another employee of the same insured injured in the course of such employment in an accident arising out of the maintenance or use of the automobile in the business of such insured." Because of the first sentence, Elvin Green was also an insured. But this effect of Par. IV did not obtain if (d) was true, that is, if Elvin Green was an employee of an insured (Frank Green was an insured) and the action was brought against him for injury or death of another employee of the same insured (Frank Green) occurring in the course of the employment by the use of the insured automobile. Therefore the policy excluded the threatened suits against Elvin Green from the coverage of the policy.

Automobile Insurance—Non-Ownership

[Fertig *vs.* General Acc. Fire & Life Assur. Corp. (13 N.Y.S. 2d, 872).]

This is a suit under a non-ownership automobile policy. The insured William L. Blumberg Co., Inc. was in the hardware business. Among its salesmen was William Fertig, the plantiff. Fertig owned and operated an automobile. The car was involved in an accident while being operated by Fertig and an injured party brought suit against both Fertig and William L. Blumberg Co., Inc., alleging that the relationship of respondent superior existed

between the two. The insurance company declined to defend Fertig but defended only William L. Blumberg Co., Inc. Blumberg denied that Fertig was its employee at the time of the accident and asserted that he was an independent contractor over whom it had no control. Fertig insisted that he was an employee subject to constant direction and control of the employer.

The pertinent portions of the policy were as follows:

"111. Definition of 'Insured.'

"The unqualified word 'insured' wherever used in coverages A and B and in other parts of this policy, when applicable to these coverages, includes not only the named insured but also any person while using the automobile * * * and provided further that the actual use is with the permission of the named insured."

Affixed to and made a part of the policy was an endorsement reading in part as follows:

"Employer's Non-Ownership Liability."

The policy does not apply: (1) to any automobile owned in full or in part by, or registered in the name of, or hired by the named insured or a partner thereof if the named insured is a partnership.

There follows a list of names together with addresses for each and a premium charge designated as advance premium. The premium listed beside the name of William Fertig, whose address is given as "New York, New York," totals $29.

The defendant contended that the omnibus clause was operative only when the word "insured," as used in the policy, was unqualified and that the endorsement, which formed a part of the policy, qualified the word "insured" to restrict the. coverage to the named insured only with respect to the operation of automobiles not owned by the named insured. Since the policy did not, in itself, provide any specified car coverage, the non-ownership endorsement must determine the scope of the coverage.

The defendant further argued that the premium charged for non-ownership liability insurance, because it was intended to protect only the interests of the named insured and not the interests of the owner of the vehicle, was written at a very much lower rate than would otherwise prevail. Rates provided for a premium of $106 for the year to cover an automobile operated in the territory assigned to Fertig in the endorsement, whereas the advance pre-

mium of $29 charged the employer for its contingent liability with respect to Fertig's automobile was less than one-third of the coverage charged.

What were the rights of the employee?

The court held that there seemed to be no privity between the employer and the two parties to the insurance contract, that is the employer and the insurance company. The premium was paid by the employer and no contribution was made by Fertig. The papers revealed that the parties to the contract did not intend to cover any cars owned by William L. Blumberg Co., Inc., but only to protect the employer and no other. While a third party may recover in certain circumstances upon a contract made by others for his benefit yet to give a third party, who may derive a benefit from the performance of the promise, an action, there must be, first, an intent by the promise to secure some benefit to the third party.

In writing the non-ownership coverage as requested by its assured, the insurance company utilized a so-called standard form automobile policy, to which was affixed the employer's non-ownership liability endorsement. This endorsement, by its terms, extended the ordinary coverage of the standard policy to automobiles not owned by the assured. In thus defining and qualifying the protection, the word "insured" as used in coverages A and B of the insuring agreement was qualified in that non-ownership liability was provided only for the named insured. The endorsement listed the names of those employees, agents, or representatives who were known to use private cars occasionally while selling the product of the named insured. Thus, cars owned by the named insured specifically were eliminated from coverage under the entire contract and the non-ownership endorsement must determine the scope of the coverage under the policy.

By its terms, the additional insured clause was operative only when the word "insured" was unqualified. The superseding endorsement qualified the coverage to automobiles not owned by the assured and extended such protection to the named insured only. This was a qualification sufficient to eliminate the clause.

The defendant contended that Fertig was not covered under the policy, whether or not he was an additional assured. Condition 2 of the endorsement specifically excluded coverage to any automo-

bile owned in full or in part by the insured. It read: "Exclusions. The policy does not apply: (1) to any automobile owned in full or in part by, or registered in the name of, or hired by the named insured * * *." Assuming, therefore, that Fertig was an additional insured under the policy, he was covered only as respects the use of any automobile not owned by him. But the automobile which he was operating at the time of the accident belonged to him and therefore he was not protected by the policy.

Broker's Blanket Bond—Trading

[Cohon et al *vs.* United States Fidelity & Guaranty Co. (13 N.Y.S. 2d, 976).]

The action was brought by the insured, copartners in business as over-the-counter brokers, upon a "Bankers' and Brokers' Blanket Bond," indemnifying the insured in the sum of $10,000 for losses sustained, generally, "Through any dishonest act, wherever committed, of any of the Employees, * * * whether acting alone or in collusion with others."

The action resulted from what may be denominated faithless acts of one of the firm's employees. On January 11, 1937, the employee reported to the firm that he had purchased for its account from one A. Perrin, 60 shares of Nassau & Suffolk Lighting Company stock at 35½. Relying on the fact that such purchase had been made, the firm sold 60 shares to customers at prices ranging from 36¼ to 37¾. No such purchase had been made by the employee. When the firm so learned it was compelled to buy 60 shares in the market in order to make delivery to its customers. These purchases were made at prices approximately 9 to 10 points higher than the prices at which the firm had contracted to make the sales. Obviously there was a loss to the firm, which was included as part of the loss sought to be recovered. In addition to this, the employee sold various stocks at certain given prices to a number of customers. The stocks sold were already on the shelves of the firm at the time of the reported sales. When the firm discovered that the sales made had actually not been made to the customers reported, and the latter refused to accept delivery, it sold the securities in the open market at lower prices than those reported by the employee. The insured claimed as a loss the difference

between the price at which it purchased the securities originally and for which it sold them. What the employee's motive was in making these sales did not appear, except to the extent that he received $625 in commissions for making the pretended sales, which sum was included in the total amount of recovery demanded.

Two important provisions of the bond were as follows:

"Sec. 7. This bond does not cover—

"a—Any loss resulting directly or indirectly from forgery, unless the forgery be committed by or in collusion with one or more of the employees.

* * *

"f—Any loss resulting directly or indirectly, from trading, actual or fictitious, whether in the name of the insured or otherwise, and whether or not within the knowledge of the insured, and notwithstanding any act or omission on the part of any Employee in connection therewith, or with any account recording the same."

The company contended that the loss resulted from "trading, actual or fictitious." It therefore became important in the course of the trial to inquire whether the transactions from which the loss resulted were in the nature of "trading." The company endeavored to show that the word "trading" would have to be construed in the common ordinary sense of buying or selling. The insured, on the other hand, relied upon the term as it is understood in the special practice of the over-the-counter market. The position taken by the insured that the term "trading" as used in the policy is to be construed in a technical rather than a broad sense is the correct one, if for no other reason than that the rule of strict construction requires an interpretation most favorable to the insured. Experts testified as to the meaning of the expression as used and understood in the Street. Sales or purchases as brokers for the account of another were excluded from the scope of the term. A difference arose, however, as to what constituted "retail sales." The insured's expert excluded from the term "trading" transactions in the nature of "retail sales," and limited the term to transactions between dealers or brokers or financial institutions. The insurance company's expert, on the other hand, called a transaction a trade if it was bought or sold on a flat price and not for the account of the customer, as in brokerage transaction; but he

did admit that where a firm is in a position to supply a stock from a given amount of shares on its shelf the resulting sales of the stock are "retail sales." He also used the expressions "wholesale trade," "retail sale" and "retail trade" interchangeably. In any event, his testimony was not precise on the subject as against that of the insured's expert that a sale to an individual customer is not trading.

What were the rights of the insured?

The court stated that a holding that every "retail sale" on a net basis is "trading," as defendant's expert testified, must lead to this reductio ad absurdum:

An employee goes out and sells and delivers stock to a prospective customer for cash which he receives and embezzles. A bonding company having issued a similar "Bankers' and Brokers' Blanket Bond" could then disclaim liability under subdivision f upon the ground that the loss resulted "from trading" in connection with which an "act or omission on the part of" an "employee" was involved. Any construction making effective such a plan would not only violate common sense but would give substantial support to a charge that insurer in drafting the bond used words that were intended to conceal rather than to express thought. The jury resolved the doubt created by the testimony of the experts as to the meaning of the term in favor of defendant, evidently deciding that the forgery was not the sole cause of the loss but that there was a concurrence of the factor of fictitious trading. In so doing they must have found that the fictitious retail sales and purchases made by the employee, and the firm's transactions to which they gave rise, constituted "trading." The weight of the credible evidence and the attending circumstances do not sustain this conclusion.

While a court is ordinarily loath to interfere with the verdict of a jury on a question of fact, the following circumstances caused the court to act otherwise: (1) The vacillating testimony of defendant's expert as to the meaning of "retail sales," which he virtually in all cases, except brokerage sales, considers "trading"; (2) although the losses may not have been the direct and inevitable and proximate results of the employee's forgery, they were undoubtedly caused indirectly thereby, and effect must be given to the word "indirectly" as used in the bond; (3) the correctness of

the method and manner of the admeasurement of such losses was not challenged, nor was the amount thereof as computed from the firm's books, the integrity of which was not attacked; (4) there was no "trading" integrated with the commission of the forgery.

Compensation—Description of Operations

[American Mut. Liability Ins. Co. of Boston *vs.* Chodosh et al. (8 A. 2d, 64).]

Chodosh Brothers and Wexler Coal & Ice Company, Inc., a corporate organization owned and controlled by members of the same family, three of them—the Chodosh brothers, and a fourth, Wexler, a brother-in-law—was engaged in the coal, ice and fuel oil business. The company had two plants, one in Carteret, another at Rahway, and in addition owned some residential property close by the Carteret plant—two houses at Railroad Avenue, Carteret, where the decedent and one of his brothers, and Wexler, lived with their respective families. In back of the residential properties was a screened summerhouse which was used by these business associates for meetings of the corporation each week during the summer months. The decedent, while painting the roof of this summerhouse, suffered sunstroke and died a week later. His wife filed a claim petition in the Compensation Bureau, and was awarded compensation. No appeal was taken. The insurance carrier had refused to defend the action for compensation against its assured, the employer, on the stated ground that the work being done by the decedent at the time he suffered sunstroke, was not "within the inclusion of the policy for insurance coverage or liability."

The company contended that the deceased at the time of the accident from which he died, was not performing a service for his employer within the scope of the "schedule of operations" set out in the insurance contract. Under this heading, the business of the employer was listed as coal merchant and the service of those insured, among whom was the decedent, stated as "* * * drivers, chauffeurs and their helpers, excluding stevedoring."

What were the rights of the company?

The court held that the determination of the Compensation Bureau was *res judicata* on the matter of the liability of the em-

ployer to pay the award but did not agree that such judgment was *res judicata* on the matter of the liability of the carrier. The carrier informed the employer that the operation out of which the death by accident occurred was not within the coverage of the contract of insurance. It had the right to be heard on this issue but it could not have had a finding on that point in the Bureau. The jurisdiction of the Bureau extended only to whether the injury or death by accident arose out of and in the course of the employment. It had no authority to determine an issue like the one here presented.

The judgment in the Bureau that the decedent met his death by accident arising out of and in the course of the employment cannot be collaterally attacked nor can it be relitigated in a subsequent proceeding.

It was argued that by virtue of Section 14 of the Compulsory Insurance Act of 1917 entitled "Limitations and restrictions on liability," that the policy covered the claim in question. The pertinent part of this enactment is that "no provision of such policy shall be construed to restrict the liability of the insurer to any stated business, * * * carried on by an assured unless the business * * * excluded by such restriction shall be concurrently separately insured or exempted as provided for in this article." But the court held that there was no such separate business, as the term is ordinarily understood, carried on by the employer. It was not contended that there was. There was no claim that at the time this contract of insurance was written that the deceased would ever be employed to paint a summerhouse in back of a residential property.

The liability of the carrier was limited by the contract to the operations of the deceased as a driver or chauffeur in the conduct of the coal, ice and fuel oil business—and any task reasonably appurtenant thereto—and nothing more.

It was contended that the carrier, by its contract, was bound to defend in behalf of the employer any suits or other proceedings, etc., although such suits were wholly groundless, false or fraudulent, and that, failing to do so, it had waived its right to raise the question now under discussion. However, the court held that this applied only to suits or claims made within the apparent schedule of operations—not one that was outside the scope of the con-

tract. If the carrier had undertaken the defense of the petition, without obtaining a non-waiver agreement, it might well have been held to have waived such right and be estopped from questioning the final judgment.

Instead it elected not to defend the suit at all on the ground that it was not within the coverage of the contract. This the court held it had a perfect right to do. At the hearing no evidence was presented tending to show that the work undertaken by the decedent at the time he met with the fatal accident was within the operations covered by the carrier's contract of insurance.

FORGERY—DEFINITION

[Fitzgibbons Boiler Co. *vs.* Employers' L. Assur. Corp. (105 F. 2d, 893).]

This is an action on a forgery bond. By the policy the defendant agreed during its term to indemnify the insured against any losses to an amount not exceeding $5,000 sustained by the latter through its payment of "any check * * * or any other written promise, order or direction to pay a sum certain in money, made or drawn by * * * or purporting to be made or drawn by" the insured or any authorized representative of the insured upon which the signature of the insured as maker or drawer was forged.

The assistant treasurer of the insured had general authority to approve vouchers for legitimate transactions and sign checks. He prepared checks of the company by these vouchers which he passed to two officers of the corporation, for signature by them as officers of the company and each check was accompanied by a pay voucher fraudulently issued by the assistant treasurer, who stated to the officer that it represented a legitimate transaction, whereas it in fact did not. The checks were presented to the banks and in case of five of them signed by the assistant treasurer with an intent to deceive and to misappropriate the proceeds, and were paid by the banks on which they were drawn and the proceeds were converted by him to his own use.

An action was commenced under the forgery bond and the question was whether the vouchers were direction to pay money and whether the signatures of the checks were forgery within the meaning of that term as used in the policy of insurance.

The court held that the vouchers could not be treated as direction for the payment of which recovery could be had. They were nothing more than business memorandum to be followed by the checks and were only steps leading to the delivery of these checks.

The court held that the signature though obtained by false representation was itself genuine. Under the circumstances there was no forgery.

The insured contended that when the assistant treasurer signed the five checks for the purpose of converting the proceeds to his own use he acted without authority and thus committed forgery. Since the insured alleged in its complaint that the employee in his capacity as assistant treasurer in charge of credits and collections "had authority to issue or cause to be issued and to sign in his capacity as assistant treasurer * * * checks of the insured, on which the name of the insured appeared, in connection with valid and legitimate transactions into which plaintiff should enter and in discharge of valid and legitimate obligations which plaintiff should incur," such a general power to execute contracts on behalf of the insured would seem to prevent the possibility of forgery in a case like the one that occurred.

HEALTH—WARRANTIES

[Massachusetts Acc. Co. *vs.* Stone (6 A. 2d, 483).]

This was an action seeking the cancellation of a health insurance policy. The policy contained the following stipulation: "No statement made by the applicant for insurance not included herein shall avoid the policy or be used in any legal proceeding hereunder." One of the questions asked in the application was whether the applicant had within the past 10 years had medical or surgical advice or treatment or any departure from good health and then asked for particulars. In answer to this question the applicant merely replied that he had consulted a physician for an infected foot. The facts were that he had also consulted five other physicians for other ailments.

Defendant had been a captain of infantry in the world war. Throughout the month of October, 1918, he was continuously at the front in the Argonne, much of the time under fire, and occasionally exposed to gas. He was honorably discharged June, 1919,

and resumed the practice of law in Newark. Beginning in the fall of that year and continuing into the spring of 1922, he had a chronic cough and frequently suffered from severe pains in his back and chest. He consulted at least five physicians. Medicines and other treatment were prescribed. He was examined by X-ray. In January, 1922, he applied to the government for compensation as a disabled veteran, but his application was denied July 27, 1922, on a rating of temporary partial disability of 1 per cent. due to chronic bronchitis. Conversely, he was rated 99 per cent. sound.

Like many other soldiers, Stone was deeply affected by the strain of battle. He was nervous, neurotic. He feared that his lungs had been injured by gas and that tuberculosis would develop in him, as it did in so many of his comrades. He undoubtedly thought himself a sick man in 1920 and 1921, and until he received the reassuring rating from the Veterans' Bureau July, 1922. By this time, his nerves had doubtlessly recovered; he felt good; the fear of tuberculosis vanished and he was, and considered himself to be, a normal, healthy man, from then until the time of his application for the policy, and for a year thereafter, when he became incapacitated by arthritis. That condition disappeared and he continued in good health for another ten years, until he was stricken with the malignant disease from which he now suffers.

What were the rights of the insurance company?

The court held that it was obvious that the defendant within the ten years preceding his application for the policy had had departures from good health beyond the infected foot mentioned in his answer. Questions in the application relating to the defendant's health were necessarily directed at his knowledge only. They sought to probe his mind and required that he answer truthfully to the best of his belief. The defendant contended that when the policy was written he was convinced that the various diseases which he formerly had were largely fanciful. Nevertheless the court held that it is difficult to classify a condition which lasted more than two years as trivial like a cold that clears up in a couple of days.

The question whether defendant had had medical advice or treatment called for more than an honest opinion,—it inquired for a fact within the applicant's positive knowledge. While a policy will not be avoided for failure to disclose treatment by a doctor

for a slight cold, the present case is not in that category. The frequent medical consultations, examinations and treatments from 1919 to 1922 were a fact material to the risk and therefore the policy could be cancelled.

Owners, Landlords, Tenants—Bursting Pipes

[Lagowitz *vs.* United States Fidelity & Guaranty Co. (11 N.Y.S. 2d, 338).]

The defendant company issued an owners and landlords, tenants liability policy. Tenants in the building claimed injury as the result of the emission of steam from a pipe which had burst. There was an appreciable lapse of time between the happening of the accident and the suffering from the effects of the steam. Action was commenced against the landlord and the insurance company denied liability under the policy. What was the company's liability?

The court held that although there was an appreciable lapse of time between the happening of the accident and the suffering from the effects of the steam, the tenants suffered from an effect which was not a normal exposure to the steam. The consequences resulting from the accident therefore constituted bodily injury accidently suffered or alleged to have been suffered by any person within the meaning of the language of the policy issued by the insurance company.

Robbery—Custodian

[Grimes *vs.* Maryland Casualty Co. (20 N.E. 2d, 982).]

The insured was engaged in the wholesaling of cigarettes, candy and tobacco, and obtained a robbery policy. He instructed his truckmen to take his truck, pick up certain cigarettes and tobacco at freight stations. The truck driver secured the cigarettes and tobacco from one freight station and put them into the truck and then drove to a second freight station, where he expected to obtain additional packages of cigarettes. He gave the delivery certificates to a freight handler and asked him to get the cigarettes and tobacco from the vault at the freight station. The freight handler and the truck driver were standing near the freight door where the truck

was parked. This door was closed. The freight handler opened the freight door and the truck driver discovered that the truck was being driven away and was then 125 feet away from where it had been parked. Later the truck was recovered but the cigarettes and tobacco which were in the truck were never found. The company denied liability on the ground that the alleged robbery was not covered by the policy.

The policy, under the provision "definitions, 'Robbery,' " Subdivision (c), provides as follows: "Definitions, Robbery, * * * (c) by any other overt felonious act committed in the presence of such custodian or custodians and of which they were actually cognizant at the time, provided such act is not committed by an officer or employee of the assured."

The question was whether the theft of the goods was committed in the presence of the custodian of the goods.

In order to decide this question the court held that it would have to refer to attestation of wills. The attestation of a will to be in the presence of the testator within the meaning of the law must take place within the uninterrupted range of the testator's vision. The word "presence" of the testator means contiguity with such an uninterrupted view between the testator and the subscribing witness that he could if so desired see the act of attestation whether in the same room or in an adjoining room. Tested by this interpretation, the court held that the theft of the goods was not in the presence of the custodian of the goods.

The words of the policy were not ambiguous and under the terms of the same there was no custodian present at the time the goods were stolen, and the company was not liable therefor, under the contract of insurance.

Safe Burglary—Ambiguity

[Copelin-Mohn, Inc. *vs.* Buckeye Union Casualty Co. (20 N.E. 2d, 713).]

The insured obtained a burglary policy from the above defendant. The burglary policy provided coverage for loss from "inside the chest or compartment in safe No. 1." The policy also provided that the company would not be liable for loss of property from within the chest or compartment contained in any safe unless both

the safe and the chest or compartment were broken into in accordance with the terms of the policy. The safe contained a steel chest equipped with a combination lock which was out of order for some time prior to the burglary. The insured kept money in a wooden compartment within the safe locked by key. At the time the safe was burglarized both the safe and the compartment door were locked but were opened by the burglars by the use of force and violence, of which force and violence visible marks were left on the outside door of the safe and upon the door of the compartment. The insurance company denied liability on the ground that the money was to be kept in a steel chest and not in the compartment. The insurer contended that the policy was intended to cover a steel chest equipped with a combination lock and not a key-locked wooden compartment as the words "chest" and "compartment" are synonymous as used in the policy.

What were the rights of the insured?

The court held that the phrase "chest or compartment" was ambiguous. The term was susceptible of two different but sensible and reasonable constructions. The terms "chest" and "compartment" may be interpreted as having an identical meaning and also have an alternative meaning. This ambiguity arose from the careless use of the word "or." It may sometimes be used to connect words having the same meaning and may sometimes also be used to connect words having different meanings.

If it was the intention of the insurer to limit its liability to a loss of money from the chest only, it was within its power as drafter of the policy, to use language more expressive and less ambiguous.

Following the rule of construction above stated, the term "chest" and the term "compartment" must be held to have been used in an alternative and not in a synonymous sense. As thus construed, the insured was entitled to recover on its policy of insurance.

OBITUARY

THOMAS BRADSHAW

1868-1939

Mr. Thomas Bradshaw, a Fellow of this Society, died on November 10, 1939.

At the time of his death he was President of the North American Life Assurance Company and no better tribute can be paid to him than was recorded by the Directors of this company:

> "The Directors record their profound sense of loss in the death of the President, Mr. Thomas Bradshaw. Realizing that no words can adequately express their sentiments, they feel that it is timely to refer in particular to his long connection with the North American Life Assurance Company, and especially to the outstanding service he rendered as President. His inspiring leadership and his genuine and absorbing interest not only in all the affairs of the Company but in the men and women connected with it, have made an impression that will last beyond the memories of all now associated with the Company.
>
> "It is with pride too, that mention is made of the place he occupied in the hearts of the people of our Country at large. No better citizen has lived among us; no man ever more completely or more unselfishly spent himself in worthy causes and in promoting the welfare of his fellow men. And with his greatness he had the simplicity of character that has ever been the mark of a true Christian gentleman.
>
> "His works shall follow him and his name shall live forevermore."

Mr. Bradshaw was a man who, fired by unusual ambition and gifted with a versatile intellect, rose from a cash-boy in a department store to the presidency of one of the largest Canadian life insurance companies. During his career he has occupied many important positions at the head of insurance companies and in public and private finance and industry. Whatever have been his duties, he has left a lead to follow in regard to the future conduct of any enterprise with which he has been associated.

At the time of his death he was connected in a directing capacity with many insurance companies and financial and industrial enterprises in Canada.

Mr. Bradshaw was the author of three books—"Essential Features of Life Insurance Organizations"; "Actuarial Tables" (published in collaboration with Frank Sanderson); and "Investments of Canadian Life Offices."

He was the first man in Canada to be elected a Fellow of the Casualty Actuarial Society, and was also a Fellow of the British Institute of Actuaries, having been the first man in Toronto and the second in Canada to qualify by examination for this Fellowship.

CASUALTY ACTUARIAL SOCIETY

NOVEMBER 16, 1939

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*Terms expire at the annual meeting in November, 1940.
†Terms expire at the annual meeting in November of the year given.
‡Deceased February 3, 1940.

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Arthur L. Bailey
Arthur E. Bateman
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ABSTRACT FROM THE MINUTES OF THE TWENTY-FIFTH ANNIVERSARY CELEBRATION AND ANNUAL MEETING

NOVEMBER 16 AND 17, 1939

The twenty-fifth anniversary celebration and annual meeting of the Casualty Actuarial Society was held at the Hotel Biltmore, New York, on Thursday and Friday, November 16 and 17, 1939.

President Perryman called the meeting to order at 10:20 A. M. The roll was called, showing the following sixty-six Fellows and twenty-nine Associates present:

FELLOWS

AINLEY
BARBER
BERKELEY
BLANCHARD
BROWN, F. S.
BURLING
CAHILL
CARLSON
CLEARY
COMSTOCK
CONSTABLE
CORCORAN
CRANE
DORWEILER
DUNLAP
ELSTON
FALLOW
FLYNN
FONDILLER
FULLER
GINSBURG
GODDARD
GRAHAM, C. M.
GRAHAM, T. B.
GRAHAM, W. J.
GREENE
HOBBS
HUGHES
JACKSON, H. H.
JONES, H. M.
KARDONSKY
KELLY
KORMES
KULP
LAWRENCE
LINDER
MAGOUN
MARSHALL
MASTERSON
MATTHEWS
MAYCRINK
MICHELBACHER
MILLS
MOORE, G. D.
MULLANEY
MURPHY
NICHOLAS
OBERHAUS
PAGE
PERKINS
PERRYMAN
PRUITT
ROBBINS
SENIOR
SHAPIRO
SILVERMAN
SINNOTT
SKELDING
SKILLINGS
SMICK
TARBELL
VALERIUS
VAN TUYL
WHITNEY
WILLIAMS
WOLFE

ASSOCIATES

ANKERS	HAGEN	PIKE
BAILEY	HARRIS	POTOFSKY
BARRON	HIPP	POWELL
CAVANAUGH	JONES, H. L.	SMITH, A. G.
ELLIOTT	KOLODITZKY	SMITH, S. E.
FITZ	LASSOW	UHL
GATELY	MALMUTH	WARREN, C. S.
GILDEA	MARSH	WILLIAMSON
GORDON	MAYER	WOODMAN
GUERTIN	NEWELL	

By invitation, a number of officials of casualty companies and organizations were present.

Mr. Perryman read his presidential address.

The minutes of the meeting held May 19, 1939 were approved as printed in the *Proceedings*.

The Secretary-Treasurer (Richard Fondiller) read the report of the Council and upon motion it was adopted by the Society. The Council had decided that the new Syllabus of Examinations for Associateship and for Fellowship would be made effective for the 1941 examinations instead of the 1940 examinations:

The following Associates had passed the necessary examinations and had been admitted as Fellows:

HAROLD M. JONES RAINARD B. ROBBINS

The following candidates had passed the necessary examinations, had met the experience requirements, and had been enrolled as Associates:

SAMUEL N. AIN	SEYMOUR E. SMITH
ARTHUR L. BAILEY	H. E. STELSON
OLAF E. HAGEN	J. CLARKE WITTLAKE
FREDERICK KNOWLES	

The following candidates had been successful in completing the examinations for Associates, but had not been enrolled by reason of the terms of Examination Rule 4:

PHILIP D. ANDERSON	ROBERT H. LITTLE
PHILIP DI SALVATORE	JOHN P. TILLINGHAST
THOMAS N. E. GREVILLE	

Diplomas were then presented by the President to Harold M. Jones and Rainard B. Robbins, who had been admitted as Fellows under the 1939 examinations.

The President announced the deaths, since the last meeting of the Society, of Thomas Bradshaw, Fellow, and Edward T. Jackson, Associate, and the memorial notices appearing in this Number were thereupon read.

The report of the Secretary-Treasurer was read and accepted. The annual report of finances follows:

CASUALTY ACTUARIAL SOCIETY

ANNUAL REPORT OF FINANCES

Cash Receipts and Disbursements from October 1, 1938, to September 30, 1939

INCOME

On deposit on October 1, 1938 in Marine Midland Trust Company		$ 4,388.47
Members' Dues	$2,700.00	
Sale of *Proceedings*	1,456.26	
Examination Fees	746.00	
Luncheons and Dinners	596.50	
Interest and Miscellaneous	19.25	
Michelbacher Fund	163.25	5,681.26
Total		$10,069.73

DISBURSEMENTS

Printing and Stationery	$ 3,436.22
Postage, Express, etc.	116.68
Stenographic Services	420.00
Library Fund	8.22
Luncheons and Dinners	705.79
Examination Expense	396.85
Insurance	36.95
Miscellaneous	139.50
U. S. Saving Bonds	3,750.00
Total	$ 9,010.21
On deposit on September 30, 1939, in Marine Midland Trust Company	1,059.52
Total	$10,069.73

Income	$5,681.26	
Disbursements	9,010.21	
Excess of Disbursements over Income	$3,328.95	
1938 Bank Balance	4,388.47	
1939 Bank Balance	$1,059.52	

ASSETS

Cash in Bank	$1,059.52
*Bonds	4,750.00
Total Assets	$5,809.52

* Includes Michelbacher Fund $1.140.59.

The Auditing Committee (W. P. Comstock, Chairman) reported that the books of the Secretary-Treasurer had been audited and his accounts verified.

The Examination Committee (N. M. Valerius, Chairman) submitted a report of which the following is a summary:

1939 EXAMINATIONS — SUCCESSFUL CANDIDATES

The following is a list of those who passed the examinations held by the Society on May 17 and 18, 1939:

ASSOCIATESHIP EXAMINATIONS

PART I:

Samuel N. Ain
Arthur L. Bailey
John M. Blackhall
Charles W. Crouse
Philip Di Salvatore
Robert Dorfman
William W. Fellers
Daniel Finkel
Thomas N. E. Greville
Howard H. Hennington
Robert G. Kelly
Lloyd A. Knowler
Bela A. Lengyel
Allan E. Paull
Stefan Peters
Herbert C. Rackoff
Norman Rosenberg
H. E. Stelson
William I. Struble
Donald J. Tevlin
Eleanor Tracy (Miss)
Bernard Weinflash

PART II:

Samuel N. Ain
Philip D. Anderson
Arthur L. Bailey
Joseph L. Clemens
Florence Conrad (Miss)
Philip Di Salvatore
Robert Dorfman
William W. Fellers
Foster C. Greene
Thomas N. E. Greville
Olaf E. Hagen
Norris W. Hetherington
Daniel Kalish
Robert G. Kelly
William Leslie, Jr.
Robert H. Little
Edwin B. Marshall
Jack Ogus
Allan E. Paull
Herbert C. Rackoff
Norman Rosenberg
S. M. Ross
Max J. Schwartz
H. E. Stelson
William I. Struble
Donald J. Tevlin
John P. Tillinghast
Lilian S. Weiss (Miss)
J. Clarke Wittlake

PART III: Samuel N. Ain, Arthur L. Bailey, John M. Blackhall, Fletcher S. Boig, A. Arthur Charous, Florence Conrad (Miss), Philip Di Salvatore, Harold A. Gouss, Thomas N. E. Greville, Olaf E. Hagen, Howard H. Hennington, Robert G. Kelly, Lloyd A. Knowler, Bela A. Lengyel, Robert Lufkin, George C. Munterich, Allan E. Paull, Stefan Peters, Herbert C. Rackoff, Norman Rosenberg, Max J. Schwartz, Seymour E. Smith, H. E. Stelson, William I. Struble, Ira N. Tuck

PART IV: Samuel N. Ain, Arthur L. Bailey, Lyle Barnhart, John M. Blackhall, Philip Di Salvatore, Thomas N. E. Greville, Howard H. Hennington, Lloyd A. Knowler, James R. Miles, Allan E. Paull, Stefan Peters, Herbert C. Rackoff, H. E. Stelson, Paul A. Turner

FELLOWSHIP EXAMINATIONS

PART I: William Lassow

PART II: Morris Kolodítzky, Walter F. Sullivan

PART III: Harold M. Jones, Rainard B. Robbins

PART IV: Harold M. Jones, Rainard B. Robbins

The Council's election of Clarence W. Hobbs as Editor and of Thomas O. Carlson as Librarian, was announced.

The annual elections were then held and the following officers and members of the Council were declared elected:

President—Francis S. Perryman
Vice-President—Harmon T. Barber
Vice-President—William J. Constable
Secretary-Treasurer—Richard Fondiller
Editor—Clarence W. Hobbs
Librarian—Thomas O. Carlson

Members of Council (terms expire in 1942):

N. M. VALERIUS H. J. GINSBURGH
A. Z. SKELDING

The papers read at the last meeting of the Society were discussed.

The presentation of new papers was begun.

Recess was taken for lunch at the Hotel until 2:15 P. M.

As part of the program in connection with the celebration, the following were given by express invitation of the Special Committee:

"Reminiscences of a Charter Member." A talk by Leon S. Senior.

"Society and Insurance." An address by W. R. Williamson, Actuarial Consultant of the Social Security Board.

On behalf of the Committee on Papers, the Editor (Clarence W. Hobbs), announced that the best paper presented during the last four years by a member of less than ten years' standing was "Policy Year Modification of Losses." The Editor thereupon presented the Richard Fondiller II prize of One Hundred Dollars to Russell P. Goddard.

After a roll-call of those Charter Members who are still members of the Society, a group picture was taken of the Charter Members present.

An informal dinner was held in the evening at the Hotel. Mr. Ray D. Murphy, President of the Actuarial Society of America and a Fellow of the Society, and Mr. R. A. Hohaus, President of the American Institute of Actuaries, were present as guests of the Society. Non-actuarial talks were made as follows:

"The Lady Casualty and Her Servitors." An Ode by Clarence W. Hobbs.

"The Old Order Changeth," by William J. Constable.

"Actuarial Diversions," by Henry H. Jackson.

"Actuaries, Retrospectively Rated," by Winfield W. Greene.

These talks were following by entertainment.

On November 17th the meeting was called to order at 10:15 A. M. by the President.

The presentation of new papers was completed.

Informal discussion was participated in by a number of members and representatives of insurance organizations upon the following topic:

"Probable Effects of the Present War on the Casualty Insurance Business in the United States"

A vote of thanks was tendered by the Society to the Special Committee on Program, James M. Cahill, Chairman, for the efficient arrangements made for the Twenty-Fifth Anniversary Celebration.

Upon motion, the meeting adjourned at 1:15 P. M.

REPRESENTATIVES OF CASUALTY COMPANIES AND ORGANIZATIONS PRESENT

Charles W. Crouse, Actuary, American Casualty Company, Reading, Pa.

H. E. Curry, Actuary, Farm Bureau Insurance Companies, Columbus, Ohio.

George A. Dierauf, Secretary-Treasurer, Compensation Insurance Rating Board, New York.

Elizabeth V. Doogan, Attorney, Arbitration Division, Compensation Insurance Rating Board, New York.

William F. Dowling, Assistant Treasurer, Lumber Mutual Casualty Insurance Company, New York.

Ernest A. Erickson, Statistician, Utilities Mutual Insurance Company, New York.

A. J. Gavey, Manager, Casualty Department, Alfred M. Best Company, New York.

Hon. C. F. Harrington, Commissioner of Insurance, Commonwealth of Massachusetts, Boston, Mass.

R. L. Inglis, Vice-President, Associated Indemnity Corporation, New York.

Myrtle S. Kelly, Statistician, Pennsylvania Compensation Rating and Inspection Bureau, Philadelphia, Pa.

Frederick C. Kessler, Secretary-Treasurer, Consolidated Taxpayers Mutual Insurance Company, Brooklyn, N. Y.

Walter Klem, Assistant Actuary, Mutual Life Insurance Company, New York.

Robert C. Mead, Actuary, State Farm Mutual Automobile Insurance Company, Bloomington, Ill.

Henry P. Morrison, Office of Woodward and Fondiller, New York.

A. G. Provis, Chief Accountant, Ocean Accident & Guarantee Corp., San Francisco, Cal.

Arthur H. Reede, Assistant Professor of Economics, Pennsylvania State College, State College, Pa.

Henry Reichgott, Group Underwriter, Equitable Life Assurance Society, New York.

F. B. Schroeter, Zurich General Accident & Liability Insurance Company, New York.

Thomas H. Silver, General Manager, Lumber Mutual Casualty Insurance Company, New York.

V. A. Trundy, Resident Vice-President, American Mutual Liability Insurance Company, New York.

Paul A. Turner, Statistician, Eastman, Dillon & Company, Philadelphia, Pa.

C. G. van der Feen, Statistician, National Bureau of Casualty and Surety Underwriters, New York.

Richard Woike, President, Manhattan Mutual Automobile Casualty Company, New York.

B. H. Zimels, Statistician, Consolidated Taxpayers Mutual Insurance Company, Brooklyn, N. Y.

VOL. XXVI, PART II NO. 54

PROCEEDINGS

MAY 17, 1940

ASSETS AND LIABILITIES

PRESIDENTIAL ADDRESS BY FRANCIS S. PERRYMAN

"In the middle of the woods
Lived the Yonghy-Bonghy-Bo.
Two old chairs and half a candle
One old jug without a handle—
There were all the worldly goods."
EDWARD LEAR.

The title of this address will very likely suggest to you several different possibilities as to the subject matter of the talk. It might conceivably be a biographical or autobiographical sketch, for of late it has become the fashion to give such biographical works rather tantalizing titles such as "The Old and the New" or "Youth and Age." My title is, however, not a disguise for reminiscence; I would not want to presume to compete with the most entertaining talk of that nature that we had at our last meeting, the Twenty-Fifth Anniversary of the Society, from that excellent speaker, our friend Leon Senior, whose recent and unexpected death was such a shock to us. The title might on the other hand bring to mind to some of you, as it did to me, Rudyard Kipling's volume of short stories, "Debits and Credits"; but of course, that is as far as the resemblance goes because I am not about to inaugurate the policy of having the presidential address consist of a series of anecdotes. Much more likely is the supposition that I am about to draw up a sort of "balance sheet" of our Society or of our profession, setting up and evaluating on the one hand our accomplishments and our resources and on the other hand our shortcomings and the duties that we owe to society. This, however, while it might be very instructive, would be too similar to the evaluation of our Society's achievements that I made in my last address to you; thus, it is not this kind of moral "balance

sheet" that is the subject matter of my address to-day. There remains one other supposition and that is that I intend to talk of "actual" balance sheets, or material assets and legal liabilities; that supposition actually is the correct one. I am going to call your attention to some aspects of the balance sheets and financial statements with which we deal in our everyday work and to put forward some thoughts which it may be helpful for us to recall from time to time. There is one advantage of deciding to make a presidential address on a technical topic such as this one, and that is that I need not attempt to make it comprehensive nor pretend to cover the whole subject in text-book fashion but can pick and choose the high spots.

It is perhaps rather more suitable that some of the observations I shall make should be made at the present time rather than, for instance, during the depths of the depression, for these are easier and more prosperous times and most if not all of the carriers whose balance sheets I shall be talking about are now in so much better financial shape than at that time. This is one of the reasons why it seems to me that the time has come to consider in a calmer atmosphere certain features or principles that it would have been rather harder to talk about a few years ago without running a considerable risk of treading on a good many people's toes. Do not think from this that I am going to explode a lot of bombs or launch violent attacks on the methods of our business. There are, however, some notions current, rising out of the recent financial hard-times, that could very well be dispassionately reexamined. Neither am I making this survey of balance sheets solely for the purpose of attacking these notions. You will readily recognize my crticisms as I come to them and I trust you will not find them unreasonable.

I intend to discuss briefly the points of view from which we should regard the assets and liabilities of the various insurance entities with which we have to deal, including not only the ordinary insurance carriers but some of the "Funds" set up for various purposes. Before going into details, let us first touch on the point as to why there is so much interest in the financial statements of insurance carriers. By "interest" I mean here not so much our professional interest, but rather the interest the general public or insureds have in such statements. When we deal with business entities in every-day life we are usually not particularly concerned

as to their financial condition, although sometimes, of course, we are incidentally concerned, as for example if we are buying an automobile and do not want to find we have an "orphan" on our hands. But normally if we are buying some goods, say furniture, we are more interested in the seller's reputation for selling good and honest products than we are in whether it is making money and will be in existence five or ten years hence. I am naturally not speaking of transactions such as investing in or lending money to an individual corporation, in which case we would be greatly interested in its financial status. With insurance, however, it is different. If a man in the street is taking out a life insurance policy that may run for ten, twenty, forty or more years, or if he is buying a five-year fire insurance policy, or even if he is purchasing an automobile policy for a year only, he has or should have a very vital interest in the financial stability of the company he is dealing with. The reason for this is, of course, obvious—when we are dealing with an insurance carrier we are dealing with a financial institution and buying its promise to do something primarily financial in character, if certain contingencies arise; and so we want to make sure the carrier will be in existence and able to carry out this promise if called on to do so. Similar consideration would apply to dealings with other financial institutions such as banks, but most people seem to be less interested in the financial strength of their banks than they are in the solvency of their insurance carriers. As to the reasons for this, several could be advanced, but I do not intend to pursue this aspect of the subject.

Now to get at last to our balance sheets. Let us consider first the usual case of a casualty insurance carrier, whether stock or mutual, whether private or public or semi-public (the last category would include for instance competitive Workmen's Compensation State Funds). The balance sheet we are now going to consider is in the usual form, in that assets are on one side and liabilities on the other; but we find that for an insurance carrier the balance sheet differs quite considerably even from those for other financial institutions, in that the liabilities are so large and contingent, in the sense that they represent a lot of debts that are as yet undetermined and in many instances not yet due. Naturally, the evaluation of these large contingent liabilities is a matter for experts, that is to say actuaries. However, I will return later to this question of the evaluation of liabilities for it seems rather

more orderly first to consider the left-hand side of the balance sheet, the assets.

Before doing this however, a few words are necessary as to the philosophy of preparing a balance sheet at all: the carrier has these more or less contingent and indeterminate liabilities and to meet them has its assets which are realizable or liquid in varying degrees: the question is, how can these different quantities be compared one with the other, or in other words, what common denominator should be used to make the desired comparison. The answer to this question is, and it is difficult to admit any other, reduce both sides to reasonable present values; that is, find out what the liabilities and what the assets are worth now. It is desirable to bear this principle constantly in mind, for while few would deny it lip service, most of the departures from sound practice in regard to balance sheet arise from a neglect of the principle, either unconscious or deliberate.

The assets of a casualty carrier consist of items such as cash, investments (bonds and stocks, real estate, mortgages, etc.), uncollected premiums, accrued interest and various miscellaneous items. I do not intend to discuss all of these in detail. The item "cash" does not require much consideration, for if the cash is in a solvent bank it can be taken at its face value. In troublous times, however, consideration may be required to be given to the banks in which the cash is held. As to bonds and stocks, however, some thought should be given to the values to be placed upon such investments. We are all familiar with the debates upon the proper method of evaluation, particularly during times of depression and panic. To the question "How are bonds and stocks to be valued for statement purposes?" the rational answer would appear to be to use market values or, perhaps, if we have had a rather different early training, we might say "not greater than market values." On second thought, it might be advisable to stop here and first ask ourselves a question or two. Bonds and stocks usually make up the major portion of a casualty company's invested assets. For what purpose are these invested assets held? To be available to meet the liabilities set out on the other side of the balance sheet and in the meanwhile to earn interest, some of which may be required to maintain those portions of the reserves which are long-term and valued on an interest or discounted basis. Arguing on these lines we could come to the conclusion that the value to be

placed on the assets, particularly invested assets, should be that which will produce the required interest (required to maintain the reserves) and the amounts of the liabilities at the time they are due. Since we know, so far as the liabilities are concerned, only approximately when and what will be due, it is hard to put the invested asset valuation on this basis. In any case, who can say what a given invested asset will be worth in the course of a few years? So here we are no further forward toward a suitable basis of valuation.

An extension or variation of the preceding argument, and another one of a rather different type, can lead to the following conclusion, at any rate for bonds. A casualty company, being a going concern and having a good part of its liabilities not due until after the lapse of what may be a considerable time in the future, does not have to sell its investments to meet its current liabilities. Consequently, provided the bonds are sound, the carrier can afford to hold them to maturity and thus can value them on a "yield basis." This leads to the amortization method of valuation. I won't go into the pros and cons of this at length. The method has some obvious advantages, the principal being that we get a steady and readily-checked valuation, and in times of depressed market values, where there is not a free or representative market, we avoid having to face the severe but assumedly temporary depreciation. All the same, I personally do not like the idea of carrying bonds at values in excess of market, even in troublous times. On the other hand, in times when market values are high, it seems just as bad to have to show all the appreciation, which is possibly just as temporary.

As regards stocks, similar principles hold, but since there is no maturity date or fixed yield, there can be no genuine amortization plan. As we all know, in times of depressed markets it has been found to be necessary to avoid the facing of severe depreciation by setting up so-called "convention values" above the actual market values. A corollary of this theory should be, that when the market is high, perhaps artificially high, convention values lower than market should be set up. This, however, has not been done. A desirable accomplishment would be the working out of a system of stable values not exceeding the actual market values. The attainment of such a millennial objective in the near future does not seem possible, in view of the degree to which times are out-of-joint.

It will be observed that in this discussion of the valuing of bonds and stocks I have apparently disregarded the principle set out just before, that the present value should be the common denominator for both assets and liabilities, and I have disregarded this principle immediately after saying that departure from it has been the root of a great deal of evil. There are several good reasons for my doing this. First of all "actual market values" may not be actual in the sense that they could be actually realized and to admit the use of temporary high present values that may melt away like the snow in spring may well be far from sound. On the other hand the interjection of hope into the balance sheet by taking values above assumed temporarily depressed prices seems equally unsound.

Real estate does not play a large part in casualty companies' assets, and this is fortunate from the valuation point of view, for such holdings are not easily evaluated. Mortgages also do not usually constitute an important factor in casualty companies' portfolios. The other assets, including premiums, accrued interest, miscellaneous balances, etc., do not call for much consideration here. Accrued interest on good bonds is easily calculated; outstanding premiums with certain precautions can be admitted as good assets; and the remaining assets which usually do not constitute a large part of the total can be dealt with on their merits.

So far, I have confined these remarks on the valuation of the assets to the actual problem of setting a value on what assets there are, and have deliberately left alone the question of the composition of the portfolio; how much cash there should be, how much in the way of bonds, what proportion in stocks, etc. This issue is tied up with the question of liquidity, and with the larger problem of the degree to which the kind of assets held should be correlated to the nature of the carrier's liabilities. It was natural that as an aftermath of the depression there should have grown up a demand on the part of policyholders for a carrier to show liquidity of its assets, and a desire on the part of the carriers to have such liquidity. It is readily understandable that, immediately after the arduous financial stress of the early thirties, when the casualty business experienced one of its severest tests, when some companies failed, when many others were almost on the brink of failure, and when all were hard-beset with adverse experience and with investment problems, losses and bank failures—it is readily understandable,

I repeat, that at that time this question of liquidity should have come to the fore and that the companies, or those that could, should have been anxious to say, "see what large amounts of cash we have and what large holdings we have of readily realizable Government Bonds." With the coming of easier times, the emphasis on this feature has lessened but it is still a highly regarded quality and perhaps too much so. Doubtless the continuance of the high degree of liquidity of many of the carriers has been fostered by the difficulty of the investment problem—that is, the difficulty of finding suitable investments and the fear of the return of conditions that will again bring large decreases in market values. Under such conditions many carriers have, in effect, said "we will play safe and invest, if at all, in Governments, despite the low yield, for in what else can we invest our money?" And here let me interject the observation that under these conditions of extremely low yields, casualty carriers have been fortunately placed, in that they do not have, except to a minor degree, to depend on interest to maintain reserves, or in other words to fulfill their contractual obligations. Certainly a nice interest income provides a desirable additional cushion and safety margin, and is a great help in paying dividends, but the reduction of interest income to a low or nearly vanishing level does not of itself impair the carrier's ability to carry out its insurance contracts nor necessitate rate increases, as in the case of our friends, the life companies, for example. There are, however, some carriers in our field to whom interest yields are of paramount importance, as for example the New York Aggregate Trust Fund, and in such cases those responsible for running such carriers or funds could not and did not sit by and see their interest yield fall off without taking action to remedy the situations.

But to return to "liquidity," a certain amount of this is undoubtedly desirable but too much is not necessary; and over-emphasis of this quality, largely enforced as it may be at the present time, may well prove a boomerang under different conditions. After all, a carrier's liabilities are not usually, except in a minor degree, payable in a short time, and even if they were, the immediate liquidation of even Government Bonds in the amounts held by the carriers would paralyze the market.

This brings me to the other and larger question of the degree to which a carrier's investments or distribution of assets should be

correlated with the nature of its liabilities. Are, for instance, bonds or fixed amount investments the most suitable for casualty companies' needs? Should not stocks find some definite place in a carrier's portfolio—say as a hedge against possible inflation? I do not intend to go into this in detail here; the Society has from time to time considered this question. For example, we had an informal discussion on "Investments" in November, 1937. I would also recall to your minds Mr. Tarbell's very thought-provoking presidential address in November, 1932, on "The Effects of Changes in Values on Casualty Insurance." Arguments as to the types of insurance desirable and permissible for casualty and indeed all types of insurance carriers was prominently to the fore during the enacting of the new New York Insurance Code, and as most of you know, in that revised Code there are laid down new regulations considerably more stringent than those heretofore in effect. It would take me too long to discuss these requirements at length, but, very briefly, permissible investments are divided into three classes, namely Capital Investments, Reserve Investment and All Others, with regulations as to the minimum amounts to be maintained in the first two classes. Capital Investments are the very preferred (that is from the point of view of security, for example Government Bonds). The Reserve Investments are the next preferable, for example good corporate bonds; and the others are the more speculative, for example, stocks. It would be an excellent thing for the Society to have a paper or two on this and other important provisions of the revised New York Insurance Code. In the case of the topic we are now considering, it would be desirable to have a full discussion as to whether the new regulations go far enough, that is to say whether they provide enough protection, or whether they go too far, that is to say whether they are too hampering.

One more observation on Assets—when making analyses of and comparisons between different companies, as has to be done by compilers of the various reports on insurance, for such purposes as guiding the public, it is necessary, of course, to give some attention to the assets; and comparisons are made of liquidity, security, etc. Naturally, some of these reports do the work better than others, although all tend to be guided by current notions, with for example over-emphasis on "liquidity." One not uncommon comparison that I would like to comment on takes the form of an

exhibit of the percentage of a carrier's assets in each category of investments, for example cash, real estate, mortgages, bonds, stocks, etc. This seems to lead to the suggestion that the larger the percentage of some particular kind, say stocks, the less desirable the portfolio. Now it may well be that the holding of well-selected stocks may have its use, if security is not thereby impaired—in any case, such undesirable investments (assuming they are undesirable) should be considered in relationship to the free surplus of the company. Take for example, two carriers—the first with well-selected assets and an adequate surplus of say $10,000,000; and the second with exactly the same kind of assets and the same liabilities, except that it holds, in addition, $2,500,000 of good stocks and thereby has a surplus of $12,500,000 —wouldn't you say that the second company was the stronger? Yet its proportion to total assets of cash and government bonds and other bonds, etc., would be less and its proportion of stocks greater than for the first carrier.

Having thus rather summarily and disjointedly dealt with the asset side of the casualty companies' balance sheets, we will apply the same sort of cavalier treatment to the liability side. The main division of the items on this side, apart from capital, surplus and general contingency or voluntary reserves (not required for any specific or known liability), are loss and loss expense reserves, unearned premium reserves, reserves for commission, taxes and other expense items and miscellaneous reserves. The most important both in point of size and difficulty of proper evaluation is the loss reserve. Many, if not most casualty claims outstanding are not at all determinate as to either liability or amount, that is to say it is often uncertain as to whether there is any actual liability to the carrier, and even if there is, then there is uncertainty as to the amount of money which will be required to settle the loss. The amount of the reserve to be placed on an individual loss is thus often purely a guess—an intelligent guess directed by experience it may be, but a guess nevertheless. Of course, when all the outstanding losses are taken in the aggregate, the law of averages can be brought into play. On the other hand, some determinate but unpaid claims (for example, claims paid over a term of years by an annuity) involve a question of purely actuarial methods. In addition, there are reserves to be set up for unreported claims and other contingencies that may have to be pro-

vided for. Altogether it is a very technical and complicated procedure to set up proper reserves that are adequate but not excessive, and the procedure by its nature requires the knowledge and experience of an expert, that is, an actuary. For the usual casualty company, special annual statement schedules are set up for the compensation and liability business, these being the lines that involve the most indeterminateness. These schedules are designed to assist at arriving at proper reserves and to give information that will enable some check to be made of the reserves carried. These schedules, which for most carriers are those collectively known as "Schedule P," are, by the nature of the subject matter dealt with, not entirely satisfactory or in their ultimate form, although they have been for many years in a process of evolution. Into their merits and shortcomings, I do not propose to delve, as a thorough discussion of them would leave me far away from my main line of thought. Some of the principal points were touched on in the informal discussion at our last May meeting.

The other casualty lines do not generally give rise to as great problems concerning loss reserves. However, property damage claims really involve exactly the same principles as liability (personal injury) claims, although the amounts involved are generally considerably less. No Schedule P is laid down for property damage, but there is a simple requirement for the showing of case estimates plus reserves for unreported claims and a reserve for the expenses of settling. Claims in respect of collision, burglary, glass and boiler and machinery business do not generally raise serious problems concerning loss reserves; on the other hand, accident and health claims require rather careful attention, particularly if there is a possibility of long-term cases, for example, permanent disability. As to fidelity and surety, particularly the latter, the loss reserves required for these lines are most troublesome to determine on a satisfactory basis. Indeed, I have given a good deal of thought and study to these lines for many years, and I must confess that my ideas on the proper methods of reserving are hazier for these bonding lines than for any other type of business. We have recently had a paper and a discussion on fidelity and surety rate making and I hope we shall have more. In addition, I think it would be of great assistance to the profession to have a good investigation into and account of claim reserving methods for these lines; the complications of the large amounts, reinsurance,

salvage and the intricate legal questions involved render the usual casualty methods almost useless without modification so great as to amount to practically complete reconstruction.

Despite the super-structure of Schedule P for the liability and compensation business, which at first sight introduces additional or different requirements for these lines, all the casualty line reserves are, or upon analysis are seen to be, made up of—*first,* reserves for the cost of known or emerged losses; *second,* reserves for the cost of unknown losses, that is, those which have actually occurred although this fact is not known to or reported to the carrier; and *third,* reserves for the expenses which will arise in connection with the settlement of the losses, both known and unknown. In connection with this third part of the reserves, that for expenses of settling, there exist grounds for differences in opinion arising out of different points of view. This is particularly true in respect of claims, the payment of which is spread over a period of years, such as liability and particularly compensation claims: and the more so since the structure of Schedule P helps to add to the confusion on this score. A considerable part of the expense incident to the handling of claims is incurred upon or soon after the reporting of the claim, but there is, of course, some expense to be met as long as the claim is unpaid. To clarify the argument, let us take the case of a compensation claim that has been reported, investigated and determined, so that all that remains to be done is to complete the payments in accordance with the status determined. Usually this takes the form of periodic payments over a period of time. It may well be assumed that most of the expense has been taken care of and that there remains only the relatively small expense of making the future payments and perhaps of checking up on the maintenance of the status of the payee, for example, in the case of a permanent total case, to see that the injured is still alive and has not recovered. The tendency seems to be to under-estimate the magnitude of these expenses in the aggregate; if we take the extreme case of a carrier ceasing to transact any new business, or at any rate any new compensation business, I think it would be found that there would be a considerable cost in the handling of such unpaid claims, and that estimates of such cost are too low, if produced by assumptions that, on the basis of a continuing business, most of the expense has already been met. Schedule P calling for "case estimates" for

all policy years prior to the latest three apparently does not specifically call for any loss expense reserves to be carried in respect of the older cases. This is what I referred to a few moments ago as fostering the confusion. But if we are endeavoring to set up reserves that will take care of the obligations of the carrier as of the balance sheet date, some provision should be made for the expenses of these older claims. In New York State most carriers now have to pay the present values of all death and certain kinds of non-fatal claims into the Aggregate Trust Fund, and the Fund very properly collects a certain amount (3%) over and above the present value to pay for the expense of handling. Thus, if a carrier, in respect of a certain death claim, belonging to, say, the third policy year prior to the current one, sets up merely the present value of the claim, then, if the claim has to be turned over to the Aggregate Trust Fund, the present value would not be sufficient to discharge the liability. Adequate expense reserves should be carried in respect of all claims to provide for the actual expense of carrying them to completion; of course, many carriers do this but it is a point easily overlooked. Some carriers seem to adopt the procedure of setting up, more or less perfunctorily, case estimates plus whatever "equity" Schedule P may produce, with sometimes a voluntary reserve as well, and then say that the equity, if any, in Schedule P and the voluntary reserves will take care of all the other contingencies, unreported cases, expenses of handling, etc. This indicates a lack of clarity in perceiving and applying the principles upon which loss reserves should be set up. These principles are, after all, in essence, quite straightforward, namely, to provide enough reserves now to discharge the company's obligations heretofore incurred. It may be that owing to the requirements of the Annual Statement the final results therein are not stated quite as straightforwardly as they might be, but on its own internal records a carrier should evaluate and set up reserves for all the different kinds of its claims liability. Not to face the facts, that is to say the cost of losses, and to omit to provide adequate reserves, is foolish if done through inadvertence or ignorance, and may be felonious if done deliberately; but to refuse to face the facts in the privacy of one's internal records is fatal.

For casualty carriers, next in size after claim reserves usually comes the unearned premium reserve. Practically this is produced mechanically, being calculated by well-defined formulas

from readily verified records kept for that purpose. From the point of view of the philosophy that underlies our balance sheets this reserve can be demonstrated to be more than ample, the only argument being as to the amount of the redundancy. The unearned premium reserve is the aggregate of the gross premiums for the unexpired risks; our philosophy requires us to provide reserves to cover the future liability of the carrier arising out of contracts already entered into, and the unearned premium reserve has to take care of all future claims, claim expenses and underwriting expenses arising out of such contracts, the loss and loss expense reserves taking care of losses already incurred. Accordingly, we should require only a portion of the gross unearned premiums, since a good deal of the expense, for example, premium taxes, commissions (in the cases of commission-paying carriers) and other underwriting expenses have already been paid or provided for elsewhere. Nevertheless, the gross unearned premiums are required to be set up in the statement on the theory that an assured can cancel or the company may have to; however, if the assured cancels, he will usually have to do so at short-rates, and in any case whether the policy be cancelled pro rata or short-rate, there is generally some recovery of items such as commissions and taxes. Another reason sometimes advanced for a gross unearned premium reserve is that the company might have to reinsure all or a substantial proportion of its outstanding business; but in such a case, unless the business were hopelessly unprofitable, some reinsurance commission, and usually a substantial one, can be obtained. You are all familiar with the pros and cons of this argument, so I will not elaborate the point. In sum, the gross unearned premium in most cases is quite substantially excessive, but there does not seem to be any sound alternative method that has any likelihood of adoption.

There are two more points I want to touch on concerning the unearned premium reserve: the first is that any method of prorating the total premium over the term of the insurance contract is inappropriate in connection with certain types of surety business, for example contract bonds, and the unearned premium reserve brought out by such a method can well be held to be *deficient*. The second is that in connection with policies written on an audit basis, particularly a periodic audit basis, to pro-rate, as we do, the deposit premium over the term of the policy is rather

meaningless, but probably no more unsatisfactory than any other plan that could be devised. Except under abnormal conditions, a reasonably managed carrier usually has a fairly substantial asset in the shape of undetermined audit premiums. I do not intend to touch on specialized unearned premium reserve features such as those in connection with non-cancellable accident and health, retrospectively rated risks, etc.

The remaining ordinary reserves, such as for taxes and other underwriting expense accrued and the commissions unpaid, do not require much notice here. They are fairly easily and satisfactorily determinable. Any other special reserves that different carriers may have to set up must depend on the circumstances of the carrier, and naturally are to be judged according to the same principle, that the carriers' obligations, whatever they may be, must be adequately provided for.

This concludes my necessarily brief survey of the liability side of the balance sheet but before passing on to consider specialized types of carriers I want to close this review of the balance sheet of the usual type of carrier by making a few observations of tests and comparisons of individual carriers. Apart from the various analyses, which doubtless most carriers make for their own information as to the condition of their friends and competitors, there are many publications and services that make and publish such analyses and comparisons for the purpose of advising and informing such interested parties as insurance buyers, agents, brokers, etc. These reports are of varying merit, reputation and price. Many of them are old-established, conscientious and competent —others less so. At one time I contemplated reviewing here a more or less representative sample of these publications; to do so fully would be a long, laborious and invidious task, and so, for this and other rather obvious reasons, I rather regretfully abandoned the idea and will restrict myself to more general observations.

These "reports," as I will call them for convenience, exist to supply a demand, and the reason for such demand is not hard to find. As we know (and who better?), the proper appraising of a carrier's statement is not easy, even for an insurance actuary and still less for a non-actuarially trained person; hence the demand for advice. The form of the report usually falls into one of two general categories. The first consists of a presentation of a more or

less elaborate set of facts and figures relating to the carrier, followed by recommendations or ratings, the reasons for which are explained sometimes more and sometimes less fully, the idea being that the conclusions are to be relied on because of the reputation and experience of the reporting agency. The second category consists of a presentation of pertinent information in such a form that the reader can draw his own conclusions, although to assist him the report often points out how and what to look for; here the method really consists of attempting to give the reader rules, of reason or of thumb, to judge carriers. Now, as we actuaries know, it is hard enough to analyze satisfactorily a carrier's statement, even with our actuarial training and experience to draw on, and even if we have access to other information not contained in the published figures. We are aware that any rule of thumb or superficial test must be used with extreme caution, and the indications must be checked and cross-checked before drawing any conclusions, and in any case, a considerable amount of professional judgment has to be used. Thus it is not hard to conclude that of the two categories of "reports" I have just mentioned, the first, if made by conscientious and experienced specialists, will be of immeasurably greater merit than the second category, which indeed can be, and sometimes is, worse than useless—indeed downright misleading. It is understandable that the second category can have a popular specious appeal, but the highly technical matter of appraising an insurance carrier cannot be reduced to a few rules of thumb any more than the Einstein-Eddington-de Sitter theory of relativity can be explained in a few pages of monosyllabic words, although this has been too often attempted. I want here to make it clear that I do not mean to include in the second category, and thereby deprecate, those excellent compendiums of figures that give in handy form the pertinent financial facts of the various carriers.

Even the better reports in the first category, because of the large number of carriers to be reported on and the voluminous work thereby entailed, are not entirely free from objections on the score of the use of certain rules of thumb and because of the inability of the compilers to be intimately acquainted with every circumstance of the carriers reported on. Any general survey of the errors and misconceptions that are found in the reports, of the second category particularly, and in the deductions made by

many people from the reports, should include the following. It is often assumed that high reserves, and still more especially high claim reserves, indicate strength and vice versa. Certainly it is true that, *other things being equal,* a carrier with higher reserves than the average is in a stronger financial condition than the average: but there are so many factors that can influence the size of the claim reserves in relation to, say, the premium volume—for instance, distribution of business by class and by territory, the age of the carrier, its history as to amount of business transacted, its policy as regards claims settling, (that is to say, whether it tries to pay up claims promptly or resists as long as possible) and many others. Thus all comparisons based *solely* on such size of reserves in relation to volume are inconclusive and can be extremely misleading. It is of course quite feasible for a trained actuary, after thoroughly studying the information available and exercising a good deal of professional judgment, to arrive at dependable conclusions as to the strength of claim reserves, although even then it is possible for a great change in economic conditions, for instance the onset of the depression of the early thirties, to upset all predictions. It is furthermore possible from available information to test how a given year's reserves ultimately did work out, but no reliable factual conclusions can be reached until after the lapse of some years, and in the meantime many conditions, either externally or within the carrier, may have changed. This reminds me strongly of the so-called "Principle of Indeterminacy" which is one of the striking features of recent physical theories. This principle asserts that in the microscopic (in contradistinction to the macroscopic) field where extremely accurate measurements are sought to be made, it is not possible to determine accurately *both* the position and the velocity of a particle such as an electron; the more accurately we fix the position, the more indeterminate is the velocity, and vice versa. This principle, which acts as a powerful means of reconciling the concurrent particle and wave theories of matter and radiation, can be exemplified by considering the process of measuring accurately the position of a particle. This we can do only by observing it with, for example, a beam of light; but this beam deflects the particle and changes its velocity, making it impossible to determine the velocity exactly. To return to our loss reserves, the analogy lies in the fact that to determine accurately the run-off of a carriers' loss

reserves we must wait for a period of years, and thus the older the reserves are, the more accurately we can measure their strength; and the more recent the reserves that we wish to test, the more indeterminate is the result of our test. Despite this existence of means of determining quite closely the results of running-off of reserves of prior years, I have seen a number of published reports giving quite erroneous results—most of these seem to be due to ignorance on the part of the compilers, some of whom should know better.

Another fallacy we find is that of comparing the unearned premium reserves of various carriers; since these reserves are determined more or less mechanically and can readily be checked, the reserves of most carriers can be taken at their face value, the only necessary precaution being to verify that the reserve is set up on the usual standard gross basis. There are many factors, such as the distribution of business by class, territory, etc., that can legitimately affect the relative size of the unearned premium reserve; thus all comparisons of unearned premium reserves as between carriers or with averages of carriers, even more than similar comparisons of loss reserves do not of themselves prove anything. Mr. Michelbacher in his timely and instructive paper, "Watch Your Statistics," presented at the November, 1938, meeting of the Society, deals quite fully with these questions of the adequacy and size of the loss and unearned premium reserves. Another weakness of most reports is the absence of consideration given to such less obvious factors as the adequacy of the carriers' reinsurance protection against catastrophe and other adverse developments. I do not think it necessary to pursue further this and other misconceptions and fallacies, as I think I have sufficiently indicated the kinds of weaknesses from which the reports can and often do suffer.

So far, the balance sheets I have had more particularly in mind have been those of what I have termed "ordinary carriers." In addition to these we have in the casualty field some other kinds of entities of funds in whose financial condition we have occasion to be interested. Some of these are "private"; for example, reinsurance or other pools set up by a group of private carriers; and some are "public"; that is, set up and supervised by public authorities, in many cases the private carriers being obliged to join or contribute to these funds. I shall not say much about these special-

ized funds; the principles upon which their Balance Sheets should be set up and analyzed are the same, *mutatis mutandis*, as those for the ordinary carriers. There are, however, a couple of points that it may be worthwhile to mention. The evaluation of the liabilities for some of these funds may involve to a very high degree purely actuarial or mathematical considerations, and the question of rate of interest the funds can earn may be of vital importance. Examples of this kind of fund are the New York "Aggregate Trust Fund" and a Workmen's Compensation Reinsurance Pool, covering the members for excess over a certain amount per accident; in both of these cases it is essential to use proper actuarial methods, including "safe" mortality tables and rates of interest that can be earned. Any deficiency in interest earnings will usually show up more quickly than mortality losses. Last year, the rate of interest upon which are calculated the present value of cases to be paid into the New York Aggregate Trust Fund was reduced from 3½% to 3% because of the deficit brought about by the inability of the Fund to earn anything like 3½% under present conditions, and there are proposals to reduce the rate still further. Incidentally, I believe the Fund will ultimately realize some, and possibly a sizeable mortality profit, but this will not emerge for some years.

There are other funds where the evaluation of the liabilities may be very difficult because of the indefiniteness of the contingencies involved or because of lack of data as to the probability of their occurrence. In these cases the best available technique must be used, and if desirable, as it usually will be, ample safety margins must be set up. Funds of this nature would include, for example, pools for the covering or reinsuring of occupational disease claims, particularly pneumonoconiosis, and funds such as the New York "Reopened Case Fund" covering Compensation cases reopened after a specified time. The recent history of this New York Fund illustrates the pitfalls that can trap the unwary or inexpert, as regards the proper provision for *incurred* liabilities; the Fund was examined by the New York Insurance Department in 1937 and found to be insolvent—quite insolvent. There were not sufficient assets in hand to cover even the cost of cases on which awards had been made or claimed against the Fund, and in addition there was a heavy liability on account of claims that had occurred and on which seven years (the minimum period before a case could come within the scope of the Fund) had elapsed, *and* a still greater lia-

bility in respect of claims which had occurred and on which less than seven years had yet elapsed. Further details can be found in Mr. Hipp's paper "Special Funds under the New York Workmen's Compensation Law" presented at the May, 1938, meeting. In the course of discussions as to the best means of rehabilitating this Fund it was argued quite strenuously—and sincerely—by many of the interested parties that it was not necessary to build up funds to cover all of this liability; that it would be sufficient to cover the first mentioned division and perhaps some of the second, but that the third was entirely hypothetical or "actuarial," and if the anticipated claims did actually emerge later, they should then be taken care of by a levy or assessment on the Workmen's Compensation business. Such arguments, which in this Society need no refutation, remind us of similar protestations that such and such a pension fund is not really insolvent but only "actuarially" so and there is no need to make up the "preposterously" large amount the actuaries say is required to take care of the accrued liability. I mention this point only as an illustration of the necessity for providing for all liabilities actually incurred or occurred or accrued, call it what you will. Incidentally, the New York Legislature at its recent session made some amendments to the Law, which will improve the position of the Reopened Case Fund. I will not discuss further these specialized funds, etc., as all I intend to do is to call your attention to them and point out that the same principles are to be invoked in the evaluation of their assets and liabilities.

So here I will conclude my brief survey of balance sheets or assets and liabilities. To many of you, what I have said is nothing very new but yet it has, I hope, been helpful to us all—I know it has been to me—to give a little thought once more to the underlying principles of that familiar statement of assets and liabilities —that snapshot of our ever-changing financial condition, to which can most aptly be applied the words of the poet Thomas Moore

> "This narrow isthmus 'twixt two boundless seas,
> The past, the future—two eternities"

THE EFFECT OF DAYLIGHT SAVING TIME ON THE NUMBER OF MOTOR VEHICLE FATALITIES

BY

JOHN A. MILLS

A study of the effect of daylight saving time on motor vehicle fatalities indicates that a considerable number of injuries and deaths might be avoided annually if clocks were advanced one hour throughout the nation from the first Sunday in April to the last Sunday in September. This result is suggested by a study of the 1938 and 1939 motor vehicle accident record of sixteen large cities, each with a population in excess of 250,000. Fatal motor vehicle accidents numbered 5,731 in these cities during the two years embraced in the study.

Ten of the sixteen cities were not on daylight saving time during 1938 and 1939. These ten cities with their total population of 6,830,000, gave rise to 2,138 fatal accidents. Six of the cities were on daylight saving time. They had a total population of 13,280,000 and gave rise to 3,593 fatal accidents during the period under observation. The individual cities covered by this analysis are listed under Appendix "A".

The hour-by-hour fatal accident record of these cities clearly shows the increased hazard brought on by darkness. The table and chart under Appendix "B" illustrate the increase in the number of fatal accidents that occur when an hour is dark as compared to when it is light. In spite of certain irregularities due to the inadequacy of the data the probable reduction in fatal accidents that would result from substituting an hour of light for an hour of darkness is clearly indicated.

The following exhibit shows that after taking into account the changes in traffic volume, fatal accidents average almost three times higher during hours of darkness than during hours of daylight. Details supporting this exhibit appear under Appendix "C".

	Average number of fatal accidents occurring each hour of each month per 10,000,000 population recognizing relative traffic volume by hour of day	
	Cities Without Daylight Saving Time	Cities With Daylight Saving Time
Daylight hours.....	7.4	6.7
Dark hours.....	21.4	17.6
Increase	14.0	10.9
% of incr.....	189.2%	162.7%

That changing an hour from darkness to daylight would result in a reduction in fatal accidents also is indicated by a comparison of the fatal accident record of each hour from 5 P. M. to 9 P. M. when it is light and when it is dark. Fatal accidents during each of these hours are roughly three times more numerous during months in which the hour is dark than during months in which it is light.

	Average number of fatal accidents per month per 10,000,000 population			
	Cities Without Daylight Saving Time		Cities With Daylight Saving Time	
	Light	Dark	Light	Dark
5-6 P.M.	6.6	23.9	5.4	19.1
6-7 "	5.7	21.8	5.2	15.9
7-8 "	8.8	16.8	4.4	12.0
8-9 "		10.7	4.0	9.0

A comparison between the fatal accident record of cities on standard time and cities on daylight saving time for the three hours from 6 P. M. to 9 P. M. indicates that a considerable number of lives were saved during 1938 and 1939 through the use of daylight saving time. In cities with daylight saving time these hours showed a reduction in accidents during the daylight saving months of 55% whereas these hours in cities that remained on standard time showed a reduction of only 38%.

	Average number of fatal accidents per month per 10,000,000 population 6-9 P.M.	
	Cities Without Daylight Saving Time	Cities With Daylight Saving Time
7 Mos. unaffected by D. S. T....	47.4	35.8
5 Mos. affected by D. S. T.....	29.3	15.9
Decrease	18.1	19.9
% of decr.....	38.2%	55.6%

It also is illuminating to compare the number of fatal accidents occurring during the last hour of daylight in the cities using daylight time with the same clock hour in cities using standard time. This hour is light in both groups of cities during the 7 months that are unaffected by daylight time whereas during the 5 months that are affected it is light in daylight time cities and dark in standard time cities. During the 5 months that are affected by daylight saving there is a reduction in fatal accidents in the case of daylight time cities whereas in the case of standard time cities fatal accidents more than double.

	Average number of fatal accidents per month per 10,000,000 population (Last hour of daylight in D. S. cities)	
	Cities Without Daylight Saving Time	Cities With Daylight Saving Time
7 Mos. unaffected by D. S. T....	6.9	5.9
5 Mos. affected by D. S. T.....	13.9	4.7
Increase	7.0	—1.2
% of incr.....	101.4%	—20.3%

Motor vehicle fatalities were not available during 1938 for the hours from 4 A. M. to 7 A. M. for most of the cities included in the survey, but the information is available for the year 1939 and it indicates that the extra hour of darkness in the morning would result in only a negligible increase in motor vehicle fatalities for the reason that the volume of traffic is so light. The available data are inadequate to form the basis for a reliable conclusion, but the figures taken at their face value point to an increase in fatalities for cities with daylight saving time of 0.6% during the five month period.

It might be argued that the adoption of daylight saving time disturbs the flow of traffic from hour to hour and that the seasonal migration of our population between the South and the North tends to invalidate certain of the comparisons which have been drawn. The influence of such changes is largely discounted when comparison is made of the combined fatal accident record for the four evening hours from 6 P. M. to 10 P. M. with the five daylight hours from 10 A. M. to 3 P. M. for cities with and without daylight saving time respectively. During the five months which are affected by daylight time, these four evening hours have 31% more

fatal accidents than the five daylight hours in the case of Daylight Time cities whereas they have 71% more in the case of Standard Time cities.

	Average number of fatal accidents per month per 10,000,000 population (Five summer months)	
	Cities Without Daylight Saving Time	Cities With Daylight Saving Time
10 A.M. - 3 P.M.	21.5	17.7
6 P.M. - 10 P.M.	36.7	23.2
Increase	15.2	5.5
% of incr.	70.7%	31.1%

The foregoing comparisons show that cities with daylight saving time had a better accident record during the hours influenced by daylight saving than did cities without daylight saving time, and the figures provide fairly conclusive evidence that the extra hour of daylight was the major factor contributing to this difference in the record. The actual saving in lives resulting from the adoption of daylight saving is estimated at 6.7% for the five daylight saving months and 2.5% for the twelve months. (Supporting details are given in Appendix "D").

The study indicates that more than 80 lives were saved during 1939 in areas using daylight saving time as a result of the extra hour of daylight. Less than 20% of the aggregate motor vehicle fatalities occurred in areas that were under daylight saving time. In estimating the additional lives that might be saved in extending daylight saving time to the month of April throughout the Nation and to areas that had not adopted daylight saving time in 1939, we are confronted with the problem of judging whether or not a test made of the accident record of sixteen large cities is indicative of the results that would be secured if the test had covered smaller cities and rural areas. Traffic is proportionately greater during the evening hours in urban than in rural areas and this in itself suggests that the savings would not be as great in rural communities. In arriving at the minimum number of lives that might be saved, the percentage savings indicated by the survey were applied to incorporated areas exclusively. So doing indicated that at least 350 deaths and probably at least 12,500 personal injuries might be avoided annually in the future if clocks were

advanced one hour from the first Sunday in April to the last Sunday in September. If similar savings were to be realized in rural areas as well, an aggregate of almost 900 deaths and over 30,000 personal injuries might be avoided each year. Details supporting these estimates appear in Appendix "E".

With so many lives at stake the question naturally arises whether or not it would be desirable to adopt daylight saving time throughout the year. There are two important reasons why such a step might not be a wise one. The first reason is the large volume of traffic that moves during the hour from 7 to 8 A. M. This traffic would be forced to move in darkness during the winter if daylight saving time were adopted on a year around basis. The second reason is the fact that business hours are set so as to utilize the maximum of the available daylight hours. It appears possible that the benefits derived from the adoption of year-around daylight saving time might be nullified over a period of time because of the readjustment of business hours and the resultant readjustment of traffic volumes.

The statistical evidence that has been presented makes it appear desirable from the standpoint of eliminating unnecessary suffering and loss of life to adopt daylight saving time throughout the country from the first Sunday in April to the last Sunday in September. It is of interest that this time schedule is substantially the schedule that was in use in Europe prior to the current war. France, Belgium and Portugal had daylight saving time during the period from April to September, and Great Britain had it from the middle of April to early in October.

Appendix "A"

The time of sunrise and sunset differs between cities and this creates distortion in the results when studying the effect of daylight saving time for combinations of cities. In order to minimize this distortion, cities whose "sun" time varies from the average by more than one-third of an hour were excluded from the study. The accompanying map shows the areas from which the cities were selected. Following are the sixteen cities, each with population in excess of 250,000, embraced in the diamond shaped areas that meet the described time limitations.

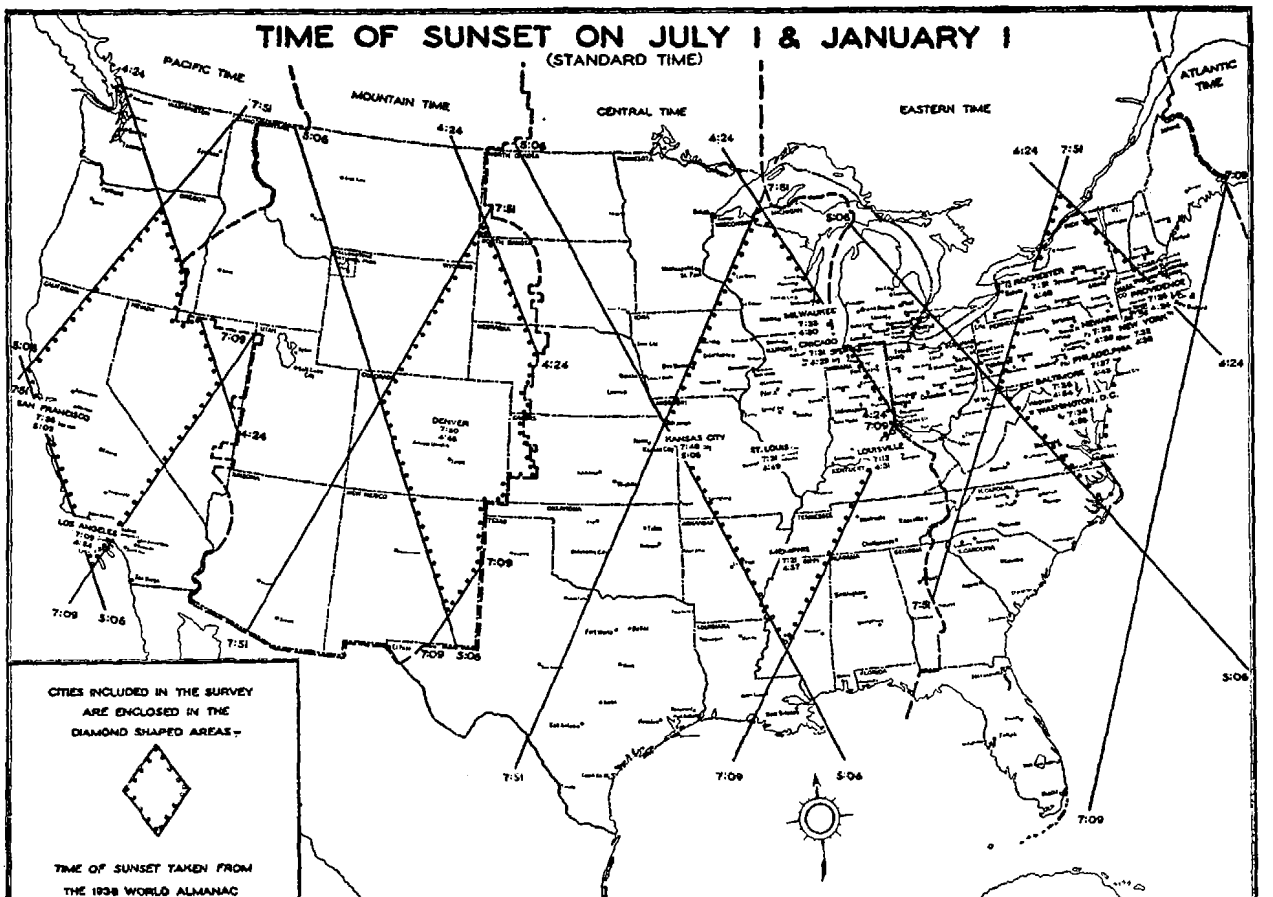
CITIES WITHOUT DAYLIGHT SAVING TIME

City	Population	No. of Fatal Accidents		
		1938	1939	Combined
Baltimore	805,000	108	125	233
Denver	288,000	56	65	121
Kansas City	340,000	63	28	91
Los Angeles	2,208,000	468	443	911
Louisville	308,000	35	46	81
Memphis	253,000	43	30	73
Milwaukee	578,000	44	56	100
St. Louis	822,000	82	81	163
San Francisco	634,000	95	106	201
Washington, D. C.	594,000	84	80	164
Total	6,830,000	1,078	1,060	2,138

CITIES WITH DAYLIGHT SAVING TIME

City	Population	No. of Fatal Accidents		
		1938	1939	Combined
Chicago	3,376,000	634	664	1,298
Newark	442,000	50	60	110
New York	6,930,000	782	760	1,542
Philadelphia	1,951,000	275	271	546
Providence	253,000	15	11	26
Rochester	328,000	36	35	71
Total	13,280,000	1,792	1,801	3,593

APPENDIX "A"


TIME OF SUNSET ON JULY 1 & JANUARY 1
(STANDARD TIME)
PACIFIC TIME
MOUNTAIN TIME
CENTRAL TIME
EASTERN TIME
ATLANTIC TIME
CITIES INCLUDED IN THE SURVEY ARE ENCLOSED IN THE DIAMOND SHAPED AREAS
TIME OF SUNSET TAKEN FROM THE 1938 WORLD ALMANAC

APPENDIX "B"

FATAL ACCIDENTS AND TRAFFIC VOLUMES DURING EACH HOUR OF THE DAY

Hour	Estimated % of Total Traffic Volume in each hour	Cities Without Daylight Saving Time		Cities With Daylight Saving Time	
		No. of Mos. in which the specified hour is in darkness	% of Tot. Fatal Accidents Occurring in each hour	No. of Mos. in which the specified hour is in darkness	% of Tot. Fatal Accidents Occurring in each hour
A.M.					
12-6	1.2	—	2.8	—	3.2
6-7	2.2	2	1.5	2	2.2
7-8	5.3	0	2.1	0	2.1
8-9	6.2	0	2.2	0	2.2
9-10	4.8	0	1.9	0	2.0
10-11	4.7	0	2.8	0	2.2
11-12	4.9	0	2.2	0	3.1
P.M.					
12-1	4.7	0	2.4	0	3.2
1-2	4.8	0	2.9	0	3.0
2-3	5.1	0	3.6	0	3.1
3-4	5.7	0	3.4	0	4.2
4-5	6.7	0	4.6	0	4.9
5-6	7.8	3	8.4	3	7.9
6-7	5.9	6	10.5	6	9.4
7-8	5.4	10	11.8	7	7.9
8-9	5.6	12	8.2	10	7.2
9-10	4.9	12	5.8	12	6.2
10-11	4.5	12	5.1	12	5.0
11-12	3.7	12	3.7	12	4.8

APPENDIX "C"

Average Number of Fatal Accidents Occurring Each Hour of Each Month per Unit of Traffic and per Unit of Population

It was assumed in this and other comparisons that darkness comes thirty minutes after sunset (approximate period of civil twilight) and that an hour is dark if an average of one-half or more of it comes after the assumed time of darkness. This assumption had to be made because accident data are not available for units of less than one hour.

Fatal accidents were not available by hour from midnight to 6 A. M. for most of the cities and since part of this period is dark and part is light it was necessary to exclude this time interval in determining the averages that are shown.

	Cities With D. S.		Cities Without D. S.	
	Light	Dark	Light	Dark
(1) Fatal accidents	776	1,000	1,426	1,468
(2) Total hours	294	138	304	128
(3) Average number of fatal accidents each hour of each month	2.64	7.25	4.69	11.47
(4) Sum of traffic volume percentages	1546.4	683.2	1601.2	628.4
(5) Total hours	294	138	304	128
(6) Average percent of traffic during each hour	5.26	4.95	5.27	4.91
(7) Population (in thousands)	6,830	6,830	13,280	13,280
(8) Average number of fatal accidents occurring each hour of each month, per 10,000,000 population, recognizing relative traffic volume by hour of day. (3) ÷ [(6) × (7)]	7.4	21.4	6.7	17.6

APPENDIX "D"

During the five months* in which daylight saving time was in effect the daylight saving cities showed an increase in fatal accidents during the hours of 6 P. M. - 10 P. M. as compared to the hours of 10 A. M. - 3 P. M. of 31.1% whereas standard time cities showed an increase of 70.7%. If standard time cities had as good a record as daylight saving cities they would have had a fatal accident rate during the hours of 6 P. M. - 10 P. M. of 28.2 fatal accidents per month per ten million population. This estimated accident rate represents a saving from the actual rate of 23.3% for the four hours. This indicated saving is equivalent to 7.3% for all hours of the summer months and to 2.7% for all hours of the year.

Partially offsetting these reductions is the indicated increase in the number of fatal accidents during the hours of 4 A. M. - 7 A. M. During 1939 this increase was 0.6% for the five summer months and 0.2% for the year. Therefore, the indicated net saving in lives which would result from the adoption of daylight saving time in these cities amounts to 6.7% for the five summer months and to 2.5% for the year.

Computations follow:

(1) Average number of fatal accidents per month per 10,000,000 population during the summer months for the hours of 10 A.M.-3 P.M. in cities that remained on standard time 21.5

(2) Increase during the hours of 6 P.M.-10 P.M. (comparable to that shown by D. S. cities..... 6.7
(1) × 31.1%

(3) Estimated fatal accident rate of standard time cities if they had adopted daylight saving time..... 28.2
(1) + (2)

(4) Total fatal accidents with estimated rate (3) times population in ten millions times the number of months..... 192.6
(28.2) (.6830) (10) = 192.6

(5) Actual number of fatal accidents during hours of 6 P.M.-10 P.M..... 251

(6) Saving during hours of 6 P.M.-10 P.M..... 23.3%
$$\frac{(5)-(4)}{(5)} = \frac{251-192.6}{251} = 23.3\%$$

(7) Saving during summer months..... 7.3%
$$\frac{(5)-(4)}{805} = \frac{251-192.6}{805} = 7.3\%$$

(8) Annual saving..... 2.7%
$$\frac{(5)-(4)}{2138} = \frac{251-192.6}{2138} = 2.7\%$$

* Daylight saving time is ordinarily in effect from the last Sunday in April to the last Sunday in September but the limitations of available data require that it be assumed to be in effect from May 1 to September 30.

APPENDIX "E"

How More Than 350 Lives Might Be Saved by the Nationwide Adoption of Daylight Saving Time

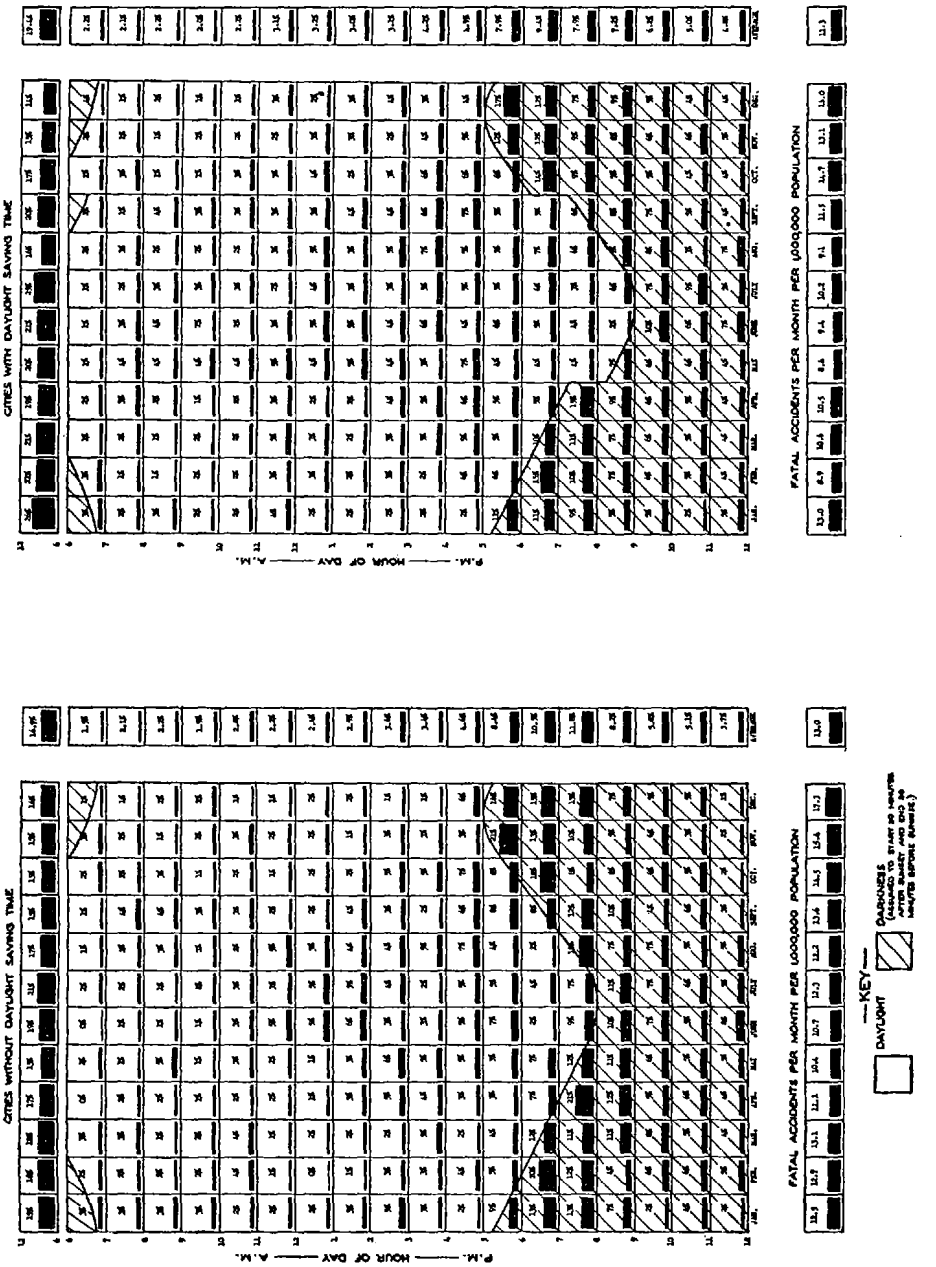
It was demonstrated in Appendix "D" that motor vehicle fatalities in certain large cities were reduced 2.5% by the adoption of daylight saving time from the last Sunday in April to the last Sunday in September. It is estimated that the extension of daylight saving to the month of April would have the effect of decreasing April fatalities by 6.7% (average decrease per month shown by daylight saving cities between May 1 and September 30). This represents a saving for the year of 0.5% and combined with the potential saving for the five months of 2.5% (per annum) makes the total potential saving per annum 3.0%.

Although darkness increases the hazards of driving in both urban and rural communities it is entirely possible that the saving in lives in rural areas would not be as great as that indicated in a study of cities over 250,000 population because the volume of traffic in rural areas is not as heavy during the evening hours. If the 3.0% saving suggested was realized in incorporated areas only it would mean 360 fewer deaths and 12,600 fewer personal injuries per year. If this saving was realized in unincorporated areas as well it would mean 893 fewer deaths and 31,255 fewer personal injuries annually. It appears therefore that the true saving would be somewhere between these figures.

Computations follow:

	Incorporated Areas	Nationwide
(1) Annual motor vehicle fatalities (Average of last three years)	14,675	34,940
(2) Fatalities occurring in areas that were under D. S. during 1939 (estimated)	3,200	6,200
(3) Estimated present saving in fatalities $\frac{(2)}{97.5\%} - (2)$	82	159
(4) Fatalities in areas not under D. S. during 1939	11,475	28,740
(5) Lives saved by adoption of D. S. in those areas not using it 3.0% of (4)	344	862
(6) Lives saved by extension of D. S. to April in areas now using it 0.5% of (2)	16	31
(7) Total saving in lives	360	893
(8) Decrease in personal injuries (7) × 35*	12,600	31,255

* Estimated ratio of injuries to each death.


CITIES WITH DAYLIGHT SAVING TIME
CITIES WITHOUT DAYLIGHT SAVING TIME
P.M. —— HOUR OF DAY —— A.M.
FATAL ACCIDENTS PER MONTH PER 1,000,000 POPULATION
—KEY—
DAYLIGHT
DARKNESS
(ASSUMED TO START 90 MINUTES AFTER SUNSET AND END 90 MINUTES BEFORE SUNRISE)

ABSTRACT OF THE DISCUSSION OF PAPERS READ AT THE PREVIOUS MEETING

CONTINGENCY LOADINGS — NEW YORK WORKMEN'S COMPENSATION INSURANCE

JAMES M. CAHILL

VOLUME XXVI, PAGE 12

WRITTEN DISCUSSION

MR. A. N. MATTHEWS:

Mr. Cahill has covered, in his usual thorough manner, this very important element of the New York Workmen's Compensation rate-making procedure and there is little that can be added to his complete exposition. The contingency loading, which has played a very important part in transforming the compensation business from a most unprofitable basis to a fairly respectable line, will be entirely eliminated as far as New York is concerned in the revision effective July 1, 1940. It is hoped that it will be many years before the need for this loading again arises.

The adjustment for interest discount shown in Table 6 is calculated on the basis of an interest rate of 3½% on the mean losses valued with credit for interest discount. Mr. Cahill states that this rate is proper even though the companies may not currently be earning as high a rate of interest, because the tables used to value the outstanding losses are calculated at 3½%. This is correct if only the effect of the interest discount on the incurred losses is taken into account. If the companies cannot earn sufficient interest on these reserves to maintain them, however, it is necessary to obtain the deficiency from surplus funds. It might well be argued that the drain on surplus necessary to maintain the reserves should be added to the underwriting loss or deducted from the profit for each calendar year. The same result could be accomplished by calculating the adjustment for interest discount at the average return rate of interest for the latest calendar year. Related to this is the matter of whether or not the mortality element in the tables used is producing redundant reserves. It is

possible that the savings as claims are liquidated (particularly permanent total claims) will largely off-set the losses that will be caused by the use of an interest rate higher than that currently realized.

The resolution relative to the contingency loading which was adopted by the National Convention of Insurance Commissioners included a paragraph to the effect that the accumulation of underwriting results should not continue indefinitely "and that it shall be terminated as to old balances after a reasonable period, viz. 5 years." Mr. Cahill is very decidedly of the opinion that old balances should not be terminated. As a matter of fact it would be difficult to justify the elimination of these balances. If the balance were to be eliminated at a time when either a net underwriting profit or a net underwriting loss is shown the contingency loading would not have served its function of producing a balance of profits and losses over a period of years. If a net loss were to be eliminated the insurance companies would be penalized and if a profit were to be eliminated the policyholders would feel that they have just cause for complaint. Of course the accumulated balance is automatically eliminated whenever the balance changes from a loss to a profit or vice versa.

In at least two states large profit balances have stimulated requests for the inclusion of negative contingency loadings in the rates. The California accumulated profit at the end of 1937 amounted to $5,708,590 or 17.3% of the 1937 earned premium. At the time of the January 1, 1939 rate revision two California insurance carriers advocated a contingency loading of minus 5%. Similarly, the Minnesota experience at the end of 1938 showed an accumulated profit of $3,199,992 or 48.7% of the 1938 earned premium. The Associated General Contractors of Minnesota has proposed the use of a contingency loading of minus 5% in the rates for that state. Incidentally, a group of employers in Minnesota unsuccessfully sued for the retroactive elimination of the contingency loading which was included in the rates for 1936 and 1937 and the return of that portion of the premium which resulted from the use of the contingency loading.

At various times in the past certain company executives have held to the belief that compensation loss ratios run in cycles the phases of which are opposite to those of the so-called business cycle. The following countrywide compensation loss ratios for all

stock companies licensed in New York tend to disprove this theory:

Calendar Year	Loss Ratio	Calendar Year	Loss Ratio	Calendar Year	Loss Ratio
1923	67.6%	1929	68.3%	1935	60.4%
1924	71.6	1930	68.9	1936	58.5
1925	67.4	1931	73.3	1937	53.0
1926	67.3	1932	71.4	1938	50.7
1927	65.2	1933	73.4	1939	54.9
1928	63.8	1934	61.9		

While it is true that the loss ratio was at its maximum in 1933 when the business cycle was at the bottom, it is equally true that in 1929 at the crest of the business cycle, the compensation loss ratio was close to the top. It is reasonable to anticipate that in the future with the contingency loading available the compensation loss ratios will run in cycles to a much greater extent than in the past, since as soon as the loss ratio has been unfavorable for a few years the contingency loading in the rates will tend to correct the situation. After a period of favorable experience as in the case of the last few years, the automatic elimination of the contingency loading and the effect of the favorable experience on the pure premiums will decrease the rate level to a point where the loss ratios will no longer show a substantial margin of profit. If the contingency loading procedure were to be modified to provide for negative loadings as has been advocated, it is probable that following a period of favorable loss ratios the rates would be reduced to an inadequate rate level and very unfavorable loss ratios would result. A company writing the compensation business for the first time at this period would be at a great disadvantage since it would not have had an opportunity to accumulate a reserve during the profitable period.

Since the contingency loading is zero when the accumulated profit is 2½% and 5 points when the accumulated loss is 2½% of the earned premium for the latest calendar year, it would appear at a casual glance that the companies are guaranteed an underwriting profit of 2½%. The following example will show that this is not the case: Assume a state with a rate level which produces exactly the permissible loss ratio each year and with no accumulated balance at the end of a particular year. The following year a 2½ points contingency loading will be included in the rates,

which in turn will produce an underwriting profit of 2½%. After this profit has been realized the contingency loading will not longer be used. Thus it is seen that the companies will have accumulated a profit of 2½% of only one year's premium over a period of a considerable number of years.

It is interesting to review the present situation as respects the contingency loading. For New York the accumulated profit at the end of 1939 amounted to $12,777,229 or 15.2% of the 1939 earned premium. Since the contingency loading will again become effective when the accumulated profit becomes less than 2½% of the annual premium, there is in New York an accumulated profit of approximately $10,670,000 or 12.7% of an annual premium to be absorbed before the contingency loading will again be used. Most other states show profit balances which appear to be very substantial when related to the earned premium of a single year. These profits appear small however when compared with the underwriting losses suffered by the companies during the thirteen year period from 1923 to 1935 inclusive.

MR. KENDRICK STOKE:

Mr. Cahill's paper is a recording of the latest development in one step of our rate-making procedure. Since he records only the latest chapter in the history of this subject, he moves smoothly from the contingency loading in use to July 1st, 1938, through the questions raised regarding its continued use, to the amendments agreed upon. I like the author's style but wish he had recorded in more detail the reasoning which preceded the conclusions arrived at. Although the subject of contingency loading was being studied in 1924 and quite possibly earlier, nowhere can I find light on certain questions which keep recurring in my mind. I seem to be in the class of a certain radio comedian of our times who also has trouble with things which keep "whizzing by." So if you will bear with me, we will confine ourselves to the question of interest and be into our subject.

In Table 4 the author presents an illustration showing reserve inadequacies indicated for each of a series of years in the case of one annuitant. Assuming a reliable mortality table, the repeated deficiencies are offset in part by reserves released when others in the group drop out. The interest discount remains to plague us, however, and the payment of the present value of awards into the

Aggregate Trust Fund is no solution. In his paper presented at the May 1938 meeting, Mr. Hipp called attention to an operating loss in this Fund for 1937, and with the almost negligible return currently received from short term Government securities we may expect deficits to continue for a time; and if they do continue, the carriers will find the problem tossed back in their laps —probably as a loading on present values to make up the deficiency.

Since the New York Compensation Act and Special Bulletin No. 190 of the New York State Department of Labor are not available to me at the moment, let us use the general annuity formula here:

$$a_x = \frac{v\, l_{x+1} + v^2\, l_{x+2} + v^3\, l_{x+3} \cdots\cdots \text{etc.}}{l_x}$$

Why have we retained the discount factor in evaluating our case reserves? Probably because the life insurance companies have always considered interest in their reserve computations, but I don't believe this is a good enough reason. Workmen's Compensation is a form of social insurance designed to relieve disabled workmen (or their dependents in fatal cases) of financial distress resulting from industrial accidents. Our first concern, then, should be to ensure the continuance of compensation benefits and what better way is there than plenty of reserves? We have been leaning more and more towards a statistical approach to our problems, so let us leave the life actuary here and listen to the statistician. We find that over a period of years he has accumulated quite a volume of statistical data and knows much concerning losses paid and their "development." Using the information he supplies, we begin:

Required Reserves = Ultimate Cost minus Losses Paid.

Since this equation gives a result greater than the total of the tabular reserves, we start looking for voluntaries to add and one of them is an "Interest Reserve"; we have now reversed ourselves and added the discount back into the reserves. Let us experiment with the tabular reserves making them a summation of future payments without consideration of interest. Our annuity formula becomes

$$a'_x = \frac{l_{x+1} + l_{x+2} + l_{x+3} \cdots\cdots \text{etc.}}{l_x}$$

A similar adjustment would be made in the other formulas omitting interest but retaining our measures of the contingencies, death, remarriage, and attainment of the non-compensable age by minor dependents. This would give us terminal or ultimate values to be used prospectively. What advantages accrue from such a change?

First, loss reserves would then approach their proper values without resorting to this legerdemain of now it's in the reserves and now it isn't.

Second, Schedule "P", parts 2 and 5a would then have more indicative value as measures of reserve adequacy.

Third, with the recent spread between assumed and realized interest rates, it is difficult to earn enough to cover these recurring reserve deficiencies. Since increasing the rate of return is apt to lead to unsound investment practices, we will find it easier to avoid this pitfall when interest earnings are no longer required to maintain reserves.

Fourth, the claims turned over to the New York Aggregate Trust Fund would carry with them an adequate payment. There would be no necessity for a supplemental deficit loading and conceivably no need for an administrative loading when the rent on capital stages a comeback.

Fifth, it is manifestly impossible to keep these annuity tables abreast the gyrations in the interest rate. Furthermore, their periodic recalculation is laborious and costly, but having established tabular values into which no discount factors entered, they would remain fixed, barring a marked change in the death or remarriage rates.

Sixth, this would eliminate some of the adjustments necessary in our rate-making process for it strikes at the *raison d'etre* of our contingency factor.

There are two rather patent objections to such a departure which should be mentioned:

First, what shall be the amount paid in case of a lump sum payment or lump sum settlement? In general, industrial commissions appear to be discouraging this practice but, when permitted because of facts in an individual case, the payments could be discounted as they are now.

Second, what is to be done where some part of the interest earned on loss reserves is to be eliminated in our rate-making calculations? I have inferred, perhaps erroneously, that this adjustment made by the New York Board was dictated by a set of mutable circumstances and not caused by any fundamental objection to interest on loss reserves for sociological reasons. In any case, there seems to be no insurmountable

barrier here—just follow a method like that given by Mr. Cahill in his Table No. 6 but substitute for the tabular rate of 3½% the net realized interest rate.

Iconoclastic perhaps, but what do outsiders think? A learned man of laws might deliver a telling counterblow by paraphrasing the cover quotation on No. 50 of our *Proceedings*:

"The jurisprudence of every nation will show that, when law becomes a science and a system, it ceases to be justice."

AUTHOR'S REVIEW OF DISCUSSIONS

MR. JAMES M. CAHILL:

Mr. Matthews and Mr. Stoke have prepared very interesting discussions of this paper. As might be anticipated, they have commented at some length on the adjustment for interest discount which was adopted concurrently with the New York July 1, 1939 rate revision. This was the most important of the several changes adopted in the method of computation of the indicated underwriting profit or loss.

Without arguing the merits of whether interest discount should be reflected in determining incurred losses and what rate of interest may properly be used in these calculations, I wish to emphasize again that the sole purpose of the change introduced in New York in the method of computing the calendar year underwriting profit or loss was to make the method consistent with the other steps of the rate-making procedure. In determining the rate level and also the classification rate relativity, the experience is developed to the equivalent of sixty months and the incurred losses are equal to the sum of the paid losses and the outstanding losses as of the valuation date. Most of such outstanding losses will represent the unpaid portion of awards on long term cases which are to be valued on the basis of tables incorporating an interest discount rate of 3.5% for claims with date of accident prior to July 1, 1939 and 3% for claims with date of accident July 1, 1939 and thereafter. If the adjustment outlined in my paper had not been introduced, there would be a basic difference in the two sets of experience data and, as a long term matter, there would inevitably be a tendency for an underwriting loss to be indicated by the accumulated results compiled from the Casualty Experience Exhibit. To make the principles underlying the computation of the calendar year under-

writing profit or loss consistent with those underlying the rate-making procedure, the adjustment outlined in the paper was adopted.

Mr. Stoke has stressed the desirability of eliminating the interest discount element entirely and has emphasized the fact that an interest rate of 3.5% is much too high for current conditions. It might be well to point out again that the New York paid losses during the first sixty months development of a policy year do not reflect the element of interest discount except insofar as the paid losses include the present value of long term claims paid into the Aggregate Trust Fund by stock and mutual carriers. In this connection, it is pertinent to review the results for policy year 1935 at six months development as taken from the Loss Ratio Data Report:

WORKMEN'S COMPENSATION — NEW YORK
LOSS RATIO DATA
POLICY YEAR 1935 AS OF DECEMBER 31, 1939
(60 MONTHS' DEVELOPMENT)

Kind of Loss	Paid Losses	Incurred Losses	Ratio of Paid to Incurred (2) ÷ (3)
(1)	(2)	(3)	(4)
Indemnity	$17,684,239	$22,528,708	78.5%
Medical	10,100,583	10,453,559	96.6
TOTAL	$27,784,822	$32,982,267	84.2%

It will be noted that the paid losses at this stage of development amount to approximately 84% of the estimated incurred losses as of the same valuation date. Obviously, the interest discount element applies to only a minor proportion of the total losses as used in the rate-making procedure in New York.

A further point is that in computing this adjustment for the July 1, 1939 rate revision we were dealing with policy years 1914-1933. The present assets of the carriers doing business during these years undoubtedly include many investments which were made during this period when it was possible to obtain a better yield than can be obtained today. Not all bonds issued years ago have been called or refunded. This point was cogently dealt with by Mr. Tarbell in the informal discussion contained in page 379 of Volume XXV of the *Proceedings*.

Mr. Flynn's paper in Volume XIV on "Interest Earnings as a Factor in Casualty Insurance Rate Making" covered in some de-

tail the subject of interest discount in the case of workmen's compensation insurance. Mr. Flynn explained the extent to which this element is reflected in the making of New York compensation rates. To my knowledge, no argument has ever been made for determining rates in New York on the basis of the terminal values of all claims rather than on the basis of paid losses plus reserves reflecting interest discount beyond a specified valuation date in the case of long term claims.

It is true that in most other states terminal values are used in the rate-making procedure. The laws of most other states are far less liberal than the New York Law, however, and only in comparatively few laws is there a provision for life pension awards for certain types of claims.

From a practical standpoint, let us analyze what the effect would be if we were to eliminate the element of interest discount from the New York rate-making procedure. It is estimated that an increase in rate level of somewhat more than 5% would be required by such a change. The effect on the average Death & Permanent Total value employed in experience rating would be much more substantial and would amount to an increase of 35% or more. The average D. & P. T. value is now $8,100 and this increase would raise it to $11,000 or more. There would be a consequent reduction in the average credibility allowed to experience rated risks because of the necessary adjustment in the rating values.

Mr. Matthews has given an excellent explanation of the fallacy of modifying the contingency loading procedure to provide for negative loadings when a substantial underwriting profit is indicated by the accumulation. Compensation experience moves in cycles. Following a period of favorable loss ratios, it is quite likely under our rate-making procedure that rates will be reduced to an inadequate level and that unfavorable loss ratios will result. This tendency would be accentuated by the use of negative loadings. The 1939 amendment of the contingency loading resolution in New York was for the purpose of introducing a further element of stability in the rate structure, thereby avoiding wide swings in rate level because of one element. This theory appears sound. To introduce a provision for the use of negative loadings would be entirely inconsistent with the principles followed in New York and would unquestionably prove very unsatisfactory in actual practice.

MERIT RATING — THE PROPOSED MULTI-SPLIT EXPERIENCE RATING PLAN AND THE PRESENT EXPERIENCE RATING PLAN

J. J. SMICK

VOLUME XXVI, PAGE 84

WRITTEN DISCUSSION

MR. MARK KORMES:

When I was asked by Mr. Constable, our vice-president, some three weeks ago to write a discussion of this paper, I did not even have an opportunity to see it. Nevertheless, being somewhat familiar with the subject, I agreed and shortly received some forty-six pages into which there were condensed the results of studies extending for a period of more than two years. If I add that the report of the Actuarial Committee to which Mr. Smick refers comprises no less than one hundred fifty-one pages, then I believe I will have established an airtight alibi for touching only lightly upon some of the aspects of the plan.

In my discussion I will follow the general pattern of the paper, first giving some attention to general considerations and then turning to technical and actuarial aspects of the proposed plan.

I cannot resist the temptation to recollect with relish the occasion when a big executive of a small company was denied a change in classification for a risk by the Classification and Rating Committee of the Rating Board. Upon being told that the Experience Rating Plan will take care of the good experience of the risk, he became red in the face and waving his arms violently exclaimed: "Don't talk to me experience rating, I know it backwards. Why, I even get it on toast for breakfast!"

Now that we have educated the company executives, the underwriters, brokers and some of the assureds to the point where they have some understanding of the workings of the plan and have sold them the idea of the scientific soundness of the plan, we are ready to scrap the entire structure and substitute a new one.

At the outset let me emphasize that I am not opposing the multi-split plan. On the contrary, I am in favor of its introduction, but I feel that any new plan must meet the test of comparison and prove that it actually accomplishes what it is purported to accomplish. I say this because I know from practical experi-

ence that if the plan were introduced, the underwriters, brokers and assureds would insist on a comparison with the results under the previous plan.

Mr. Smick enumerates several elements with respect to which the multi-split plan produces more satisfactory results. I agree that the plan offers greater responsiveness and flexibility and that it possesses further inherent possibilities for development. I cannot, however, entirely subscribe to its greater simplicity. As far as the simplicity of the rating procedure is concerned, the multi-split rating plan is vastly superior to the present plan, but as respects the explanation of the various elements it cannot claim that degree of simplicity. True, loss modification factors, loss splits and payroll factors are eliminated, but the "expected loss rate" and the "D" ratio will not be as easy to explain as it may appear. While more accurate than the present payroll factors, the "expected loss rates" will be just as obscure to the general public as the payroll factors. The "D" ratios will most probably defy any attempt at explanation. Moreover, the "D" ratios are calculated in a somewhat similar manner to the calculation of the excess ratios at the present time. It is still questionable whether the distribution of losses by size of loss for individual classifications follows the pattern of such distribution for the business as a whole (see Exhibits IV to VI inclusive). This problem in my opinion requires further study and a very interesting paper could be written on the subject.

It is claimed for the multi-split plan that it places greater emphasis on frequency and lesser on severity. It is questionable, however, whether it gives such greater emphasis in comparison with the present plan. To illustrate the point I have taken the "Illustrative example No. 1" from Mr. Smick's paper and calculated the corresponding results under the present plan. This involved several assumptions as respects the size of the losses under $400 and as respects the payrolls for the years 1932 and 1933. The losses under $400 were considered to be all normal and the payrolls were taken at $150,000 for the early years. For the early years the actual adjusted losses were taken equal to the expected losses. The present plan modification was then calculated to be a charge of 25.6% which compared with the multi-split plan charge of 23.7% gives the latter an edge. The question was then raised, "What was the effect of a single additional loss

of $50, $100, $200, $400, $1,000, $2,400 and $5,500 on the modification of the risk or, of course, the reverse, the reduction in losses by such a claim?" The table given below shows the results of such calculations.

COMPARISON OF THE RESULTS UNDER THE MULTI-SPLIT PLAN WITH THOSE UNDER PRESENT PLAN

Basis	Modification Under the		Charge for Additional Losses	
	Present Plan	Multi-split Plan	Present Plan	Multi-split Plan
The same experience	1.256	1.237	..	..
Additional loss of:				
$ 50 Indemnity	1.260	1.243	.4%	.6%
100 "	1.264	1.249	.8	1.2
200 "	1.272	1.261	1.6	2.4
200 "				
200 Medical	1.283	1.284	2.7	4.7
400 Indemnity	1.288	1.284	3.2	4.7
1,000 "	1.335	1.327	7.9	9.0
2,000 "				
400 Medical	1.375	1.367	11.9	13.0
4,000 Indemnity				
1,500 Medical	1.438	1.379	18.2	14.2

It appears from the above that a single loss has a far greater effect under the multi-split rating plan than under the present plan and that the benefit of discounting the losses does not accrue until the loss reaches a substantial sum. The risk in question produces an annual premium of approximately $4,000. Thus a $50 claim will cost the assured $16 under the present plan and $24 under the multi-split plan, and for ten such cases the assured will pay $240 under the multi-split plan as against $160 under the present plan. Of course, the reduction in the experience charge or the increase in the experience credit will be greater under the multi-split plan than under the present plan. It may be therefore argued that the multi-split plan offers a greater incentive toward accident prevention.

Far be it from me to base my conclusions on a single example. I believe that similar tests should be conducted on a number of risks with various premium sizes, particularly smaller risks where the possibilities of effective accident prevention are rather limited. The example, however, has brought out the fact that the concept of greater emphasis on frequency is a relative one. Perhaps the

real solution lies in the recognition of the fact that credibility should be expressed as a function of two variables, frequency and severity. True, this will make our formulae still more complicated, but we need not fear complications if our results will meet the criteria which we propound in advance.

The simplicity of the rating procedure will tend to reduce the mechanical work of experience rating in the various rating organizations. On the other hand the work required in the calculation of rating values will be considerably increased as is hinted by Mr. Smick in connection with the calculation of the "D" ratios.

Now let us turn to some theoretical aspects of the multi-split plan. The modification formula is given as

$$M = \frac{A_p + B + WA_e}{E_p + B + WE_e} \tag{1}$$

In the calculation of loss constants the off-balance of the rating plan plays a very important part. Let us examine what changes will be necessary under the multi-split plan. The experience rating data will have to be punched to produce the following amounts:

$$\Sigma A_p, \Sigma A, \Sigma E_p, \Sigma E, \Sigma WE_e, \Sigma (A_p + B + WA_e), \Sigma (E_p + B + WE_e)$$

the sum to extend over all rated risks. It will become apparent from the following why all of the above information is necessary. In the first place we must establish the average off-balance produced by the plan. We have for the off-balance, b:

$$1 - b = M_a = \frac{\Sigma (A_p + B + WA_e)}{\Sigma (E_p + B + WE_e)} \tag{2}$$

In order to represent (2) in the form of equation (1) let us consider that we can obtain the average value of W from

$$W_a = \frac{\Sigma WE_e}{\Sigma E_e} \tag{3}$$

This value of W_a will permit us to find the corresponding value of E and B_a. It can be found from the definitions of W and B that

$$E = W_a (S - Q) + Q \tag{4}$$

$$\text{and } B_a = [K + (gS - K) W_a] (1 - W_a) \tag{5}$$

In actual practice it may be just as accurate to read of the values of E and B_a from the tables for W.

Now the average discount of Expected Losses of D^E can be obtained from

$$\frac{\Sigma E_p}{\Sigma E} = D^E \tag{6}$$

and the average discount of Actual losses D^A from

$$\frac{\Sigma A_p}{\Sigma A} = D^A \tag{7}$$

We then have $M_a = \dfrac{AD^A + B_a + W_a A\,(1 - D^A)}{ED^E + B_a + W_a E\,(1 - D^E)}$ (8)

In the expression (8) there is only one unknown element, A. Solving for A we obtain

$$A = \frac{M_a\,[ED^E + B_a + W_a E\,(1 - D^E)] - B_a}{D^A + W_a\,(1 - D^A)} \tag{9}$$

Having in this manner expressed the average off-balance in form (1) let us from now on use for the off-balance the form

$$b = 1 - M = 1 - \frac{A_p + B + WA_e}{E_p + B + WE_e} \tag{10}$$

In order to eliminate the offsetting adjustment in rates, a_1, we must divide the expected losses by a_1. Since, however, both W and B are functions of the expected losses we will obtain

$$b_1 = 1 - \frac{A_p + B_1 + W_1 A_e}{\dfrac{E_p}{a_1} + B_1 + W_1 \dfrac{E_e}{a_1}}$$

$$\text{or } b_1 = 1 - \frac{(A_p + B_1 + W_1 A_e)\,a_1}{E_p + B_1 a_1 + W_1 E_e} \tag{11}$$

where by simple calculations

$$W_1 = \frac{E - a_1 Q}{a_1\,(S - Q)} \tag{11a}$$

$$\text{and } B_1 = [K + (gS - K)\,W_1]\,(1 - W_1) \tag{11b}$$

Of course, it may be found best in practice to find both W and B from tables for the value of $\dfrac{E}{a_1}$.

Now the offsetting adjustment in the new rates, a_2, will again effect the off-balance (as well as the values W and B) we have

$$\text{in effect } b_2 = 1 - \frac{(A_p + B_2 + W_2 A_e)\, a_1}{E_p a_2 + B_2 a_1 + W_2 E_e a_2} \tag{12}$$

$$\text{where } W_2 = \frac{E a_2 - a_1 Q}{a_1 (S - Q)} \tag{12a}$$

$$\text{and } B_2 = [K + (gS - K) W_2] (1 - W_2) \tag{12b}$$

Unfortunately we cannot use the tables since a_2 is an unknown value and must satisfy the equation

$$a_2 - a_2 k b_2 = e \tag{13}$$

where k is the proportion of premium over \$500 subject to rating and e is given by

$$e = 1 - \frac{\text{Excess of Premium over permissible loss ratio (Risks over \$500)}}{\text{Total Premium at Manual Rates (Risks over \$500)}}$$

We must therefore solve simultaneously equations (12) and (13). Since B_2 is quadratic in W_2 and therefore in a_2 and since from (13)

$$b_2 = \frac{a_2 - e}{k a_2} \tag{14}$$

a substitution in (12) will lead to a cubic equation:

$$\alpha a_2^3 + \beta a_2^2 \gamma + a_2 + \delta = 0. \tag{15}$$

Where the coefficients α, β, γ and δ can be calculated from the known values of E, K, g, S, Q, a_1, A_p, A_e, E_p, E_e, k and e. The expressions are rather complicated and are omitted in order to conserve the space.

It is natural to ask the question why should there be any off-balance under the multi-split plan. If it were decided to make the plan balance the situation would be simplified considerably. We would have

$$b = 0 \tag{16}$$

$$\text{and therefore } a = e \tag{17}$$

and this would eliminate the whole question of off-balance in connection with the loss constant calculation. The difficulty lies, however, in the fact that e may represent quite a substantial reduction in rates (10% or even more) which in turn would result in a sizable increase in loss constants. Still the so much desired simplification would be attained, the off-setting adjustments would be reduction factors in all cases and the equalization

of small risk loss ratio and large risk loss ratio just as accurate as under the present procedure.

Mr. Smick by writing his paper has performed a valuable service not only to the membership of the Society but also to the public at large. The wealth of new ideas presented in this paper, its clear and readable form, will no doubt stimulate a great deal of thought and discussion. When the plan is put into operation (which I sincerely hope) the impetus for further research and improvements will and must always come from the acid test of the actual results.

AUTHOR'S REVIEW OF DISCUSSION

MR. J. J. SMICK:

In some respects the paper read before the Society at the November, 1939, meeting was not exactly an impartial presentation of the Multi-Split Experience Rating Plan. It was an obvious effort to influence the adoption of a plan which to me seems superior to the existing experience rating plan. I presented the new plan in as favorable a manner as possible. It was my belief that, in view of the rather strong sentiment prevailing in some quarters against its adoption, that ample criticism would be forthcoming in the discussions.

Mr. Kormes has taken advantage to criticize certain features of the plan. He has, however, treated it so gently that I am somewhat disappointed. A rating plan which, on the basis of present indications is about to supplant one which with some modifications has been in effect since 1923 certainly should be closely analyzed and all weaknesses publicized. If it is a worthwhile plan it should be able to withstand much rougher treatment than that accorded it by Mr. Kormes.

The fact that Mr. Kormes did not see fit to criticize the plan severely does not in any way detract from the value of the points he does bring out. These are few but are nonetheless well taken. The points he has chosen to discuss are:

1. The expected loss rates and "d" ratios.
2. The effect of a single claim on the rating.
3. The effect of the plan on the off-balance and loss constant calculations.

The details of the derivation of the "expected loss rates" are given in the paper. The resulting expected losses that will be obtained from an extension of payrolls by the expected loss rates should, except for the introduction of group rate level, give the same results as the present procedure. It should be no more difficult to explain the expected losses under the Multi-Split Plan than under the present plan. I think that a more serious cause of trouble may be the adopted procedure of changing the expected loss rates from year to year. It will be necessary to tell an assured that in the 1941 rating the expected loss rate for policy year 1939 was, let us say, .90 while in the 1942 rating, the rate may change to .85, thus materially increasing the charge and reducing the credit.

It seems to me that the expected loss rates once established should remain fixed throughout the rating period. The present procedure of keying the expected losses to the level of the current manual rates is in a large part due to a desire for a balanced plan. In practice the plan has never been in balance.

I believe it would be in the interests of the business to dispense with some theoretical niceties in order to obtain a simple and more workable plan. A large step in that direction would be to start with the manual rate actually charged for the year of coverage, remove the expense loading, and use the remainder as the expected loss rate. This procedure would accomplish the following:

1. It would divorce the calculation of the modification from the manual rates and enable ratings to be performed in an orderly manner without waiting for approval of any pending revisions. The carriers and the administrative bureaus would be freed of the pressure occasioned by holding up calculations until rates and rating values become available.
2. It would simplify an explanation of the rating procedure to the assured. All that would be required as an explanation would be the following. "On your 1939 policy the manual rate was $1.00. This rate allowed 40 cents for expenses and 60 cents for losses. We are comparing your actual losses with the expected losses. Subject to other elements that must be taken into account, if your actual losses are less than the expected you receive a credit, if they are greater you receive a charge. You can verify the 1.00 manual rate by referring to your previous ratings."
3. It would tend to correct certain deficiencies in the present

rate-making procedure. If for some reason the current manual rate is out of line it is difficult to show an assured that the experience rating plan gives him any relief. On the other hand under the proposed procedure, it could be explained that if the rates charged in the past have been out of line, the use of the past rate in the rating gives some relief. If the rate has been too high, the expected losses will be greater and the modification will result in either a smaller charge or greater credit. If the rate has been too low, the reverse will be true. Furthermore, if the current manual rate is attacked it can be pointed out that if the actual experience under the coming policy year is better than that contemplated by the rate, relief will be given when the experience is used in the rating.

The effect of a single claim on the rating, under the present plan and under the Multi-Split Plan has been analyzed by Mr. Kormes. His deductions although correct, do not present the entire picture. The Multi-Split Plan is a three-year plan while the present plan uses five years of experience, weighted to be sure. It is to be expected that the effect of any loss, whether discounted or not, will be greater on a three-year plan than on a five-year plan. Thus the effect of a claim under the Multi-Split Plan though greater, will be felt for only three years while the lesser charge under the five-year plan remains for a longer period. The discounting procedure allows the use of a shorter period by minimizing the charges arising from high cost cases.

The effect of the Multi-Split Plan on the loss constant and off-balance calculations is a subject on which little time has heretofore been spent. The present program of the Actuarial Committee of the National Council contemplates a rather exhaustive study of rate-making methods and I believe one of the first items will be a revision of the loss constant procedure. It may well be that when the Multi-Split Plan is adopted the formulae and procedures outlined by Mr. Kormes will be an excellent starting point for integrating the proposed studies with the changes required because of the Multi-Split Plan.

Needless to say, I am in complete agreement with Mr. Kormes that the plan offers almost an unlimited field for future study and experimentation. The suggestions he has thrown out so freely should be followed up. I hope he follows some of them himself and prepares another paper on the plan.

INFORMAL DISCUSSION

Automobile Rating Plans

Chairman Harmon T. Barber: This period of informal discussion is intended to be genuinely informal. We haven't practiced the usual "fifth column" tactics of approaching members in advance and asking them to talk on a particular phase of the subject—at least, we haven't done so to the same extent as on some previous occasions. The subject selected by the Program Committee, namely, "Automobile Rating Plans," is general enough and of sufficiently wide-spread interest so that we feel that discussion will be generated more or less spontaneously.

Of course, the discussion need not consist only of an exposition of the various plans which are currently in effect, but possibly some good new ideas may be advanced as to how individual automobiles should be rated, methods which may be quite different from those in actual use today. Also, it would be helpful if the members will interject questions as we proceed; not necessarily questions directed at the speaker who may be on the floor at the time, but questions which other members may answer if they will. I think that would help to promote informal discussion.

I have asked Professor Blanchard to make a few introductory remarks on the subject of automobile rating plans. He was selected because of his knowledge of, and academic interest in, automobile rating matters, and because the topic for discussion has some competitive angles, which, although they may provoke unusual interest and discussion, we do not wish to emphasize here.

If he will take over at this point, I believe we can be sure of getting a proper introduction to the subject.

Mr. Ralph H. Blanchard: In introducing this informal discussion of automobile rating plans, I assume that it will have to do with private-passenger cars.

Methods of merit rating individual motor cars and individual drivers have long been sought. It has usually been felt that the experience of individual cars or drivers is not a valid indication of hazard, and that the various proposed methods of presumably valid measurement are impracticable, largely because of expense.

But during the past two years, induced by competition and facilitated by favorable loss ratios, many plans have been proposed and several adopted.

The case for these plans has been so often and so well stated that it would be pointless to repeat it. I shall, therefore, more or less in the role of devil's advocate, state the objectives to these plans and propose certain questions, answers to which might be instructive.

It has been objected that plans which determine rates charged or which provide for the return of a portion of the premium on the basis of individual claim experience for one or two years are unfairly discriminatory because such experience is no indication of the hazard of the individual risk. This objection is emphasized by the fact that the individual experience may be determined by the business policy of the insurance carrier. Payment of a nuisance claim, or setting up of a reserve where payment of a claim is highly improbable, will both serve to create an unfavorable record. If a claim is paid or a reserve set up where there is no responsibility for the accident on the part of the insured—where it has not resulted in any way from his qualities as a driver or motor-car owner—it should hardly be taken as evidence of hazard.

It has been urged that these individual merit-rating plans will promote safety, that their operation will induce a motor-car owner or operator to conduct himself more safely than he otherwise would. Possibly so, although that argument is purely theoretical. But it would seem to be improper to adopt a rating plan which goes beyond the object of measuring relative hazard.

In addition to the objections based on principle, one hears the practical suggestions that these plans will lead to suppressed notices of accident, that insureds will attempt to settle minor claims themselves to keep their records clean; and that insureds' conviction of innocence, whether justified or not, will often cause dissatisfaction.

The following questions are directed to clearing up certain doubts which have arisen in connection with merit-rating plans, and to developing information on their basis and extent:

1. To what extent are the private-passenger classification scheme, safe driver reward plan, and the New York preferred risk plan based on experience?
2. Why does the treatment of the claim-free car, i.e., the determination of the reward, vary between New York and other States?

3. Have any practical defects appeared in the administration of .these plans because of failure to report accidents or claims, dissatisfaction with the definition of an accident or claim either through the payment of nuisance claims or the setting up of reserves where no payment was made, or because of attempts to secure benefits of an A or A-1 class where they were not justified in New York or other States, or because of difficulty in keeping records on the part of the carriers?
4. To what extent have these plans been put into effect in the various States?
5. To what extent have they been adopted by participating carriers?
6. To what extent have they resulted in reclaiming business from carriers already using other plans for preferred risks before these plans went into effect?
7. To what extent did carriers which had preferred risk plans in effect—that is, which quoted rates lower than the Bureau standard generally or under special plans—continue to compete on that basis with the new plans?

CHAIRMAN BARBER: Professor Blanchard has given us some points to talk about. Does anybody care to make a response?

MR. CHARLES J. HAUGH: In discussing the questions that Mr. Blanchard has raised, I should like to think of these rating plans and classification plans all in terms of what they really are—procedures adopted in an attempt to develop better methods of classification of private passenger business.

For a long time we had the WXY classification which we all knew was becoming outmoded and which has gradually been disappearing until it has been eliminated on a substantial part of the passenger business throughout the country, although still in effect to a limited extent. That basis of classification was an attempt to measure the hazard by consideration of the size, price, weight and horsepower of a car. It doesn't necessarily follow that because those particular criteria no longer measure private passenger car hazards that there are no differences in hazard among passenger cars.

Attempts to measure those differences in hazard, of course, go back some time, but in recent years we have had, as Mr. Blanchard has stated, types of plans similar to the old merit rating plan but operated on an individual company experience. In such cases the company reviews its own experience on the car and the

policy is renewed at a reduced rate if there has been no claim during the experience period.

Under the safe driver reward plan risks are classified retrospectively on the basis of their actual loss experience. Under so-called "occupational rating" plans, risks are classified on the basis of the occupation of the named assured as a means of attempting to differentiate between risks by measuring the extent to which the car is used on the assumption that people in any given occupation all use their cars to the same extent. There is also in effect under the private passenger classification plan a procedure which endeavors to get at the extent of use on a somewhat different basis than occupation; i.e., by classification of cars, first, as to whether they are or are not required to be used in business; secondly, as to whether the assured will sign a statement to the effect that the car is not, has not been, and will not be operated over a prescribed mileage, and will not be operated by more than one or two people, neither of whom is under a prescribed age.

There are a number of plans, each of which represents an attempt to arrive at a practicable means of differentiating among private passenger cars on a basis which will so classify them as to provide rates which are reasonable and adequate for each group.

There has been a very substantial expression of opinion on the part of the public, indicating their dissatisfaction with a rating basis which simply provides a single average rate to be applied to all private passenger automobiles. In talking with individuals you will find innumerable instances where Mr. A, who operates his own car, rarely permitting someone else to operate it, resents paying the same premium as his next-door neighbor who keeps his car running from one year's end to another. The problem is, how to classify the risks?

Mileage, in itself, probably appeals to a lot of us as a means of classifying risks if some reasonable measure of it could be obtained. By that is meant, varying the premium, not to reflect each additional mile a car travels, but rather on some basis of broad grouping. The private passenger classification plan is an attempt to do that. It makes a classification line between risks that go over 7,500 miles a year and those that go less than 7,500 miles a year. It is based on a signed statement by the assured; there is no attempt to measure mileage. There is no loss of

coverage in the event the assured should improperly state the mileage. The plan is predicated on the not unreasonable assumption that the great majority of the people will make an honest statement. The assured is required to sign the application, and the great majority of people who sign an application stating that they do not expect, during the coming year, to drive, and have not in the past driven more than a prescribed mileage, will do so in good faith. The plan has not been in effect long enough to afford any particular experience data; time alone will tell how well it works.

Attempts to measure differences of hazard on the basis of occupation alone are in effect with some carriers. There are arguments for and against this. It seems a somewhat far-fetched assumption that people generally, in any given occupation, will all be inclined to use their cars to about the same extent, or will or will not be inclined to use their cars in business. It would seem that a more reasonable basis for classification would be an attempt to segregate cars used in business from those which are not, the assumption being that where cars are required to be used in business, a greater use of the car may be expected; this producing a greater hazard, other things being equal.

The safe driver reward plan is a plan along the line toward which several of Mr. Blanchard's questions were directed. It provides for a return of 15% of the premium if the car has been insured under both forms of liability coverage and has been free of claims during the full policy period. It is a basis of classifying risks on the strength of what actually happened on the risk—a not unreasonable basis of classification, it seems to me, being based squarely on facts.

Question has been raised as to whether such a plan might be unfairly discriminatory. No procedure which treats all risks of a given class identically is unfairly discriminatory. Legislation against unfair discrimination was enacted for the purpose of prohibiting practices which would afford to one assured treatment which another assured identically situated could not secure; and that is certainly not the case with a plan of this type.

In discussions of compulsory insurance that have been current in the past couple of years, not infrequently we find suggestions that it would be desirable to have compulsory insurance on a deductible basis. I do not argue in favor of this, but I wish to

mention that from the public's point of view there seems to be merit in the feeling that perhaps the public should, to some limited extent, share in a loss. The safe driver reward plan, of course, accomplishes that objective in a practicable way much more than could be accomplished on a deductible basis. It seems to me a hopeless task to try to write individual cars on a deductible basis; attempting to collect the assured's retention on each individual claim. I don't think, in practice, it could be done. But, in effect, the same objective is attained through the medium of the safe driver reward plan.

Question was raised as to the extent to which some of these plans are used. I can't answer, exactly. The safe driver reward plan is in effect in thirty-four or thirty-five States, and the private passenger classification plan is in effect in at least that many States.

Question was raised as to why the treatment accorded to a claim-free car in other States is not accorded in New York State. The safe driver reward plan was not put into effect in New York State because it was impossible to obtain agreement among all the carriers in New York State to a single plan of that kind.

In reply to the question whether there have been any practical defects in either the safe driver reward plan or the classification plan, I can only say I suppose there have been some, but not any of serious consequence. Apparently they have not been widespread or we would have heard of them. There were some complaints over the use of signed applications in connection with the private passenger classification plan. That was only to be expected. The use of signed applications in the casualty business has not been popular and some objection to the practice is bound to occur.

As to the extent to which the particular plans to which I have referred have been adopted by participating carriers, I am not in a position to state. In New York State there is a classification rating plan used by all carriers. The safe driver reward plan is not in effect but there is a "Preferred Risk" rating plan that is used by all carriers. As to the practices of participating carriers outside of New York State, they are the ones to answer, rather than myself.

There is one thing to which I should like to refer in connection

with the use of occupation as a means of measuring differences in hazard, since it indicates to some extent the difficulty of attempting to classify business solely on the basis of occupation. There is a company which has or did have a plan (these occupational plans sometimes change quickly) which treats employees of insurance companies in an unusual way. I was quite interested in it, as it does indicate some of the problems that apparently are encountered in trying to classify business in that way. Employees of casualty companies are entitled to a discount of 15%; employees of life insurance companies are entitled to a discount of 10%; employees of fire insurance companies are entitled to nothing! (Laughter.)

Frankly, I don't remember the other questions which were asked.

MR. BLANCHARD: I'll write to you. (Laughter.)

CHAIRMAN BARBER: I wonder if you'd outline the differences between the two plans for any who are not entirely familiar with the subject.

MR. HAUGH: The safe driver reward plan is a plan which provides that risks which are insured both for bodily injury, automobile liability and property damage liability for a period of twelve months shall, if they have no claim arising during that period, be entitled to a return, thirty days after expiration of the policy, of 15% of the premium.

In determining whether they are or are not entitled to a return premium, any allocated claim expense or medical first aid is not treated as a loss; however, any claim paid, or a reserve on a claim, is treated as a loss, and if there is a claim payment or a reserve in existence at the time of review, the policyholder is not entitled to a return.

MR. BLANCHARD: May I interrupt you? Supposing a reserve is taken down and he's not properly chargeable with a claim.

MR. HAUGH: If neither a claim payment nor a reserve has been made at the time of review, he is entitled to a return. If there is a reserve at the time of review, he is not entitled to it.

Before we get to the definition of the other plan there is one further point. The question arose as to whether the experience of an individual car for a period of a year is indicative. I think it is, for classification purposes. While the safe driver reward

plan is applied as a rating plan, its effect is a classification plan which recognizes the fact that those who have had one accident have a greater probability of having another one.

Now, as to the private passenger classification plan. That plan classifies risks into what are known as Class A, Class A-1, Class B and Class C. Class A is the class applied to private passenger cars which are not required to be used in business. Class A-1 is the class applied to those Class A risks which, in addition, submit an application signed by the assured, stating that the car has not been, during the past twelve months—and is not expected to be, during the next twelve months—operated more than 7,500 miles a year, and that there are not more than two members of the household who operate the car, and that no individual under twenty-five years of age operates the car. Figures that are available indicate pretty clearly that those licensed operators under the age of twenty-five account for much more than their share of accidents; that's the reason for the age limit being set at twenty-five.

Class B are those private passenger risks which do not come under the definition of A or A-1, and for which financial responsibility is not required.

Class C are those risks for which financial responsibility must be filed.

CHAIRMAN BARBER: What are the rate differentials?

MR. HAUGH: The rates are now published rates on regular rate pages. Generally, and when the plan was first initially promulgated Class A was 20% off Class B, and Class A-1 was 25% off Class B. Class C risks take additional percentages for filing certificates of financial responsibilty. As I remember, it is 10% for filing of financial responsibility on account of an unsatisfied judgment, 25% and 50% for the other two subdivisions of the class.

MR. BLANCHARD: Ten, twenty-five and fifty.

A MEMBER: How about farmers and clergymen?

MR. HAUGH: They take Class A rates. The actual experience does indicate that farmers' risks and clergymen's risks are considerably better than the average.

CHAIRMAN BARBER: I hope a little later someone will attempt to describe the differences between the New York experience rating plan and the plans which Mr. Haugh has so well discussed.

We'd like to hear from some of the companies which perhaps are not using the plans which Mr. Haugh has described.

MR. F. STUART BROWN: I'll attempt to describe one of the competing plans. This is based on the theory, or some of the theories, to which Mr. Blanchard takes exception. It is a plan which provides a progressive system of discounts on the basis of the individual risk's experience.

Each car is rated individually within the assured group, as an assured may own two or three cars. One car may be accident-free, the others may be involved in an accident. There is a graduated discount over a period of years beginning with 10% for the first year, 15% for the second year and 20% for the third and succeeding years during which no accidents are charged against the car.

The experience is based on the first nine months, and the discount is applied to the renewal of the risk. It involves all losses —bodily injury or property damage. No expense is counted as a loss.

The plan is applied to the car rather than to the operator. One question I have in mind is whether it would not be possible to use such a plan for individual operators and to develop an experience record for operators. It seems to me it might be a better scheme than the basis of rating the cars within the family group.

I don't know whether such a plan can be applied to the writing of individual commercial cars. The companies have plans covering groups of five or more cars, but I don't know that it would be possible to write *individual* commercial cars under any form of experience rating.

I believe in limiting the experience to the individual company's record for a number of reasons. In the past, the attempt at experience rating where the experience of the companies in a group for years fell down was because the brokers would readily report the previous carrier had no losses or, in some cases, the assured may have denied that he had an accident record. There has also been a question as to the validity of the previous carrier's experience.

The reduction of the premium on renewal by the application of discount does away with the necessity for reviewing the experience before renewal and again a month after expiration, and the

experience and work involved in returning the credit which has been earned and paying the check over to the assured.

The obvious advantage of making the discount applicable only if the business is renewed in the same company is, that the company is enabled better to hold its business. The expense of operating is reduced and it avoids the costly practice of switching. One of the worst things we have to deal with today is switching of business from one carrier to another.

I am in favor of the individual company experience as the sole criterion for rating, because, when the risk is first written the companies go to some considerable expense in attempting to underwrite the individual car. By building up a continuous record, it is possible to reduce that cost, and with the low premiums today on individual cars, some means of handling the business profitably have to be found.

One objection that I have to the plan of rating A, A-1, B and C, is that it goes right back to the system of rating we started with back in 1914 or '15, when we had business, private, pleasure and business, and pleasure only. In that system we found that the bulk of cars inevitably fell into the lowest discount group and I think that will happen under the A, A-1, B and C system. The assured is going to say he is using his car for pleasure only, and the bulk of the experience will therefore fall into this group.

In support of my statement, take the previous experiment. I have in mind the 15% merit discount that was applied several years ago, which lasted fifteen months before it was thrown overboard. The previous carrier's experience was not always available or was incorrectly given. The expense of obtaining the previous carrier's record, if you're going to do it correctly, is prohibitive.

If a plan similar to the one I have described should be used with the previous carrier's experience included, then the only way I can see to carry out the plan in a matter at all satisfactory would be through a central claim index similar to the claim fraud index. Let all the records go in there and experience be obtained from that source in the case of switching business.

CHAIRMAN BARBER: Mr. Brown, how many States is your plan effective in? Could you give us a rough idea?

MR. BROWN: I don't know, offhand, how many States it's in

because we analyze our experience by that basis only in the larger States. It's in a good majority of the States.

CHAIRMAN BARBER: You might say in nearly every State where the safe driver award plan is operative?

MR. BROWN: I think pretty generally. In some States we have followed the A, A-1 and B rating because we must, not because we believe in it. (Laughter.)

MR. HIRAM O. VAN TUYL: I wonder if I could ask one question. I believe that the rate for the second year depends upon the experience of the first year, and I suppose the renewal rate has to be known at the date of renewal. I take it that the experience probably covers less than twelve months in order to arrive at a renewal rate before the expiration of the policy. I wonder how that's done.

MR. BROWN: The experience on renewal is based, in the case of the first year, on the first nine months' experience. As the car progresses from 10% on the basis of an accident-free year and at the end of the next nine months (that is, at the end of a year and nine months), it goes to 15% if there have been no accidents. It does work out that, in some cases, a risk will have an accident in the first nine months and will lose the discount. If the accident occurred during the remaining three months, the assured will still get his 10% discount because the renewal policy has been issued. He may work up to 20% discount, and if the loss which throws him back occurs in the first nine months, he'll go back to manual. If it occurs in the three months following, he'll drop back into the 10% group.

CHAIRMAN BARBER: The point has been made that this application of the adjustment in rate to renewal business is less expensive and perhaps more practical than a retrospective adjustment or possibly a prospective adjustment based on previous years' experience of a similar character. Has anybody any observations to offer on that particular point?

Professor Blanchard raised a question as to how effective these merit rating plans or individual risk rating plans have been in reclaiming business. Has anybody any experience to present on that particular point?

The members of my "fifth column" seem to be deserting me here. (Laughter.) There are a number of points which occurred

to me as being worthy of consideration in connection with this general topic of automobile rating plans or rating methods. One is the age of the driver. Shouldn't there be some distinction in rate made for the elderly drivers? For example, in accident insurance we know that a great many companies have an age limitation of sixty-five or seventy years, beyond which they will decline to renew the accident policy.

MR. HAUGH: Well, as a matter of fact, don't you think it might be impracticable? The reason for age differentials in the field of accident insurance is, if they have an accident at that age, the probability of their recovery is considerably less. Presumably those, who on account of age become unfit to operate motor vehicles, are automatically refused licenses by the State. This theory may not work out in practice, but it could be gotten around, it seems to me, by having the car insured in some one else's name. And your idea was what? Prohibit insurance?

CHAIRMAN BARBER: No, my question is directed to this point, that I believe the underwriters feel that an elderly driver is a less desirable risk than a younger man.

MR. HAUGH: I think your actual records, while they indicate that those over sixty or sixty-five seem to show a worse loss experience than the average, are nowhere near as bad in this respect as the young drivers.

CHAIRMAN BARBER: Can someone give us some information as to the practices of participating carriers in rating individual risks?

MR. HAROLD M. JONES: I can speak for one company. The classification plan is followed in all States in which it has been adopted in exactly the same way as the stock carriers except, in my company, the percentages have been reduced for the non-regulated States. The A-1 classification allows a 15% reduction from the Class B rates, and the A classification allows 10%; but the application of the plan is exactly the same in all other respects.

My company does not use the safe driver reward plan, but has designed to use instead a plan almost identical with the Preferred Risk Rating Plan with a difference in the rating period. They use for the first renewal, ten months' experience, and then for all succeeding years they take one year's experience; they ignore all expense and medical first aid payments.

CHAIRMAN BARBER: What's the period of time they use? Ten months?

MR. JONES: It's never more than one year, but in the first year it's only ten months of the current year, then for all later years it's one year commencing two months prior to expiration. It takes in the last two months of the previous year.

CHAIRMAN BARBER: Would you be good enough to outline for the members the preferred risk rating plan which is in effect today?

MR. JONES: Well, the preferred risk rating plan is a prospective plan that bases its renewal rate on the experience of the previous year and nine months, and there is a means of exchanging experience between companies, so it's not all based on the experience of the current carrier. A form has been prepared which is forwarded to the previous carriers, if any, during the previous experience period.

CHAIRMAN BARBER: That plan is followed by all companies operating in New York State?

MR. JONES: I believe it is.

MR. BLANCHARD: Mr. Barber, I wonder if I might not read my first question again? Most of the interest has been in all of the questions succeeding the first one.

1. To what extent are the private passenger classification scheme, safe driver reward plan and New York preferred risk plan based on experience?

I'd also like to add after that: To what extent has preparation been made to accumulate experience to check on their operation?

MR. HAUGH: Mr. Chairman, that question was aimed in this direction. (Laughter.)

MR. BLANCHARD: To what extent was the scheme as a whole based on an analysis of experience?

MR. HAUGH: The safe driver reward plan is based upon experience in this respect: by consideration of claim frequency you can determine in advance, with a reliable degree of accuracy, the proportion of business that might be expected to earn the return in any one year. Some assumptions have to be made to the extent that there may be duplication of claims in a risk; other than that you can base it wholly on actually available facts.

In determining rates at that time there was introduced into the rate an additional provision of two and one-half points in the rate to allow in part for the safe driver reward return. There was also a modification made in the basis of determining commissions which, to a limited extent, took care of a portion of the return. The balance would necessarily have to come from improved experience. In other words, those two elements did not take up one hundred per cent of the return under the plan.

In respect to the classification plan, some figures were available from studies which have been made, and representing a couple of years' experience of a group of Bureau companies segregated by classification, in such a way as to permit a separation between cars used in business and those not so used.

Part of that segregation was necessarily based on judgment. Some of it could very readily be determined. For example, any saleman's car was automatically assumed to be used in business; the same for any doctor's car.

So far as the Class A-1 is concerned, that is largely predicated upon a consideration of loss records by age of drivers. Material published by the Connecticut Department, for example, has been quite complete in that respect, showing the accident records by age group, and it was consideration of that material, supplemented by material from other States, that enabled us to establish the A-1 classification, with a limit of twenty-five on the age of drivers.

The selection of 7,500 as the mileage point is judgment predicated upon the assumption that the average annual mileage of a private passenger car is 7,500 miles. That judgment can be substantiated to a very considerable extent by estimates put out by the oil industry.

Now as to the extent of the provisions made to secure information in the future. The standard statistical plans were amended to provide for separate coding of A, A-1 and B classes, C classes having been coded previously. Provision was made for accumulating the returns made under the safe driver award plan. Neither plan has been in effect long enough to enable us to have any experience at this time, but plans were definitely set up concurrently with the introduction of the rating plans so as to make available the experience which will show the extent, if any, to which the plans should be modified.

A MEMBER: Mr. Haugh, how long was the period on which you base the safe driver reward plan?

MR. HAUGH: Five years. As a matter of fact, it hasn't changed tremendously as between a five-year period and the last couple of years. The small change in frequency wouldn't make a lot of difference.

CHAIRMAN BARBER: Of course it's going to be disappointing for the actuarial profession if we can't prepare a half page to take up the plan. However, I think that won't detract a great deal from the advisability of the plan from a practical point of view.

The reference was made by one of the speakers to the old merit rating plan which was in effect a number of years ago. It was abandoned after a little over a year's existence. It seems to me that there were some experience results drawn off by some individual companies in connection with that plan; that is, the risks which received a credit were segregated in one group, and those which did not were segregated in another.

Has anybody any information along that line?

MR. HAUGH: Yes, we had some figures on that. They were compiled for two policy years during which the plan was in effect.

The data did clearly show there was a substantial difference in loss costs between those risks which got the merit rate and those which did not. I don't recall the exact figures, but I do recall it was a very substantial difference.

Of course, a very large proportion of the risks got the merit rate, and it was pointed out that there was a lot of difficulty due to the necessity for interchange of experience and its having to be based upon only partial returns, not a complete policy year; but in spite of all that, it did show that there was merit for some recognition on the risk.

MR. BROWN: In connection with the working out of our plan, the ten, fifteen and twenty per cent discount groups, countrywide, run about the same loss ratio.

CHAIRMAN BARBER: You mean when you compare losses against earned premium?

MR. BROWN: On the earned discounted premiums the loss ratios are almost the same in the three groups.

CHAIRMAN BARBER: You don't make any distinction between commission rates?

MR. BROWN: No, we don't have that argument with the agents about the commission.

MR. BLANCHARD: The same percentage?

MR. BROWN: On the reduced premiums. Then there is no argument. (Laughter.)

The expense under the first year that we have the policy and for those which have reverted because of an accident in the previous year is quite high. The loss ratio is quite high in that group. But the ten, fifteen and twenty run almost the same.

CHAIRMAN BARBER: This general subject need not be limited to the rating of individual risks—individual car risks. I think it would be quite proper if we had some questions or comments on the experience rating of net risks—treatment of various other kinds which is afforded by the manual.

MR. HIRAM O. VAN TUYL: Mr. Barber, I shouldn't say anything at all. I'm not particularly familiar with recent developments in automobile insurance except as read in the insurance press, but I have an idea that if we had someone here who was thoroughly competent or who was brave enough to do so and who had a blackboard, he could set before us all the factors which should affect the making of automobile rates. If we could consider them, forgetting about the automobile manual and how rates are developed at the present time, and set down one after another the various factors which would justify changes in the classification of risks, I think it would be well worthwhile.

I haven't heard anything said here this afternoon about the use of territories. We seem to take it for granted that the classification of the country into territories is working along all right, and is justifiable as a part of our rating plan. Of course, the difference in congestion in different parts of the country, in different counties and cities, does make one difference—that would be one thing that would appear upon the blackboard. But there are a great many other things which I think we all agree, as practical matters, do affect the hazard, to which the underwriters don't seem to be able to give any weight.

It seems to me the matter of mileage is one of the most important things; except for two or three broad classifications we fight

shy of using mileage, at least in the case of private passenger risks. Then there is the matter of the age of the driver and the question, of course, as to whether the driver or the number of drivers or the condition of the car should be given the greatest weight.

We have gotten away from this classification of cars pretty largely, but there must be twenty-five or thirty different things which, in theory, do affect the hazard of the individual risk, and it would be interesting if we could list all of those factors and look at them and consider how many of them it is practicable to consider in the erection of a rating plan. If we could forget all about the present automobile rating plan and could attack the problem in a constructive way, I don't know where we would arrive, but at least it might prove stimulating. I was in hopes that someone here today might open up the subject along these lines.

CHAIRMAN BARBER: Mr. Van Tuyl is calling for the actuarial approach.

I think your question with regard to territories is quite pertinent because the old territory—I shouldn't say "the old," but the present territory system is one which has been in effect for a number of years, and I think an analysis of the situation would show that cars today are being driven further away from home than they were ten or fifteen years ago.

Now, if that is so, should the territories be expanded or should they be narrowed? Should we have fewer territories or more territories?

The question of limits is another matter which might very well receive attention. Is there any necessity for it? Why the choice of limits which is available today? Is the thousand-dollar limit satisfactory or are there some people who feel that one thousand dollars is worse than no coverage at all? Could we use a combination limit—bodily injury and property damage?

I think a number of those items might very well crop out if we made a review such as Mr. Van Tuyl has in mind.

MR. BROWN: Another question which comes in is the expense loading on a pure premium base.

CHAIRMAN BARBER: You mean you think we might have a flat expense element regardless of pure premium?

MR. BROWN: Because the rural car gets a very high expense loading in dollars. It costs just as much to write the policy, and to underwrite it, as it does for the New York risk. It is ten times the premium, sometimes.

CHAIRMAN BARBER: Nearly half of your expense loading is made up of commission items. Claim expenses are probably a function of loss cost pure premium, and when you take the residue of the average rate it probably is not substantial.

MR. BROWN: The rural risk is getting the benefit at the expense of urban rates.

CHAIRMAN BARBER: That is probably quite true, and undoubtedly the New York City risk is possibly paying a little more than it should from a strict cost analysis standpoint.

MR. A. N. GUERTIN: There are two questions that come to mind in connection with this matter. One has to do with the number of insured cars as contrasted to the number on the road. The discrepancy is so large that consideration seems to be warranted to the subject of its reduction. I wondered, as I was listening to the discussion on the safe driver reward plan, and the other plans discussed, if these plans have resulted in increasing the number of insured cars and whether these plans have attracted other than the type of people who ordinarily buy insurance on their cars.

The second question I have is with reference to the so-called "uninsurable risk." From time to time we get inquiries in the Department along these lines: "Why can't I get insurance? I never had an accident, but I have been refused insurance by several companies." That's a serious thing in view of the public policy involved. From time to time there has been introduced in the legislatures of various states legislation providing that if a citizen shows that he has been turned down for insurance by a number of companies, some State official shall assign the risk to some company and at a rate determined by that official. I'd like to hear some discussion on that point also.

CHAIRMAN BARBER: The question of assigned risks is a pertinent one. I think, in some instances, there has been agitation for the assigned risk to be written in excess of manual, the penalty being sufficient to take care of commission and taxes of the com-

pany that does take the risk, which gets one hundred per cent of manual for service and for losses.

Is that actually in effect in some states?

MR. HAUGH: Yes, Mr. Chairman, it is in effect in Massachusetts, New Hampshire and Maine.

In New Hampshire, there have been relatively few risks up for assignment since the plan was put into effect. You will recall that, in Illinois, when legislation was enacted for the assignment of occupational disease risks, it was enacted on a plea that there were twenty-eight hundred people clamoring at the door looking for insurance for occupational diseases. Statutory pools were created, one for stock and one for non-stock carriers. The stock pool, which had the bulk of the business, has had eleven risks! Those who had claimed inability to secure insurance disappeared when the plan for assignment was provided.

In Massachusetts I believe some five thousand risks have been assigned. In the New Hampshire plan I don't remember the exact number; it has not been very large. The Maine plan was made effective recently, so there are no figures available. I don't know whether there's been a risk assigned in Maine yet.

Question is asked as to the extent to which rating plans would tend to bring about a situation where the great majority of risks would automatically insure. It seems to me, this isn't a question of a rating plan. I say that because if it were, it might reasonably be expected the thousand-dollar policy to which you, Mr. Chairman, referred a moment ago, might have an extremely wide sale and tend to bring into the fold a tremendous number of risks not previously insured, because they didn't have five thousand dollars to protect. While there has been some sale of the thousand-dollar policy, I would hesitate to say it has tended substantially to increase the proportion that is insured. I rather believe there is a substantial part of the automobile owning public which is not interested in insurance at any price. There probably is a substantial portion of the automobile operating public who have nothing particular of their own to protect, and which is having trouble in meeting the monthly payments on the automobiles which are being operated.

Stop alongside a gas station sometime and see how many come in and say, "Put in a quarter's worth," and drive on. Those

people are not in a position to pay anything for insurance and want nothing of it. I doubt whether any particular type of rating plan or any particular type of policy is going to induce them to carry insurance.

CHAIRMAN BARBER: It is possible that the individual rating risk plans have reclaimed a certain number of assureds who have dropped coverage because of the inequity of the previous existing system.

MR. HAUGH: That I don't dispute at all. My point is, that there is a substantial part of the public which never did insure and never will. I do think that there are a number of individuals who did discontinue their insurance. There are a number of people who have been brought back to insurance largely through the introduction of rating plans which do differentiate between risks, but I still think there are a number who never will insure.

MR. BLANCHARD: A bill providing for compulsory automobile insurance was introduced in New York during this last year. There was no intention to have this bill go through this session, but undoubtedly it will come up for serious consideration next year.

In the new insurance code there is a provision that rates for automobile insurance which is required by law shall be subject to approval by the Superintendent of Insurance, so that if such a bill were passed, it would bring automobile rates definitely under his approval.

There is a rather elaborate provision for an assigned risk plan, part of which is to the effect that a risk may be assigned at a special rate to be approved by the Superintendent.

CHAIRMAN BARBER: Are there any questions which have not been taken up? Professor Kulp, have you any points on your mind?

PROFESSOR CLARENCE A. KULP: Well, this is perhaps a bit remote. I want to ask Mr. Haugh to what extent the recent State practice to eliminate the type of car on B. I. L. rates is based on productive results?

I have been noticing, during the last ten years, the type of car has become very unimportant, and in our State, except in the rural areas, has become completely zero.

MR. HAUGH: Mr. Chairman, that is quite right. At one time there was a substantial differential. A number of years ago it was just taken for granted that an individual struck by a Pierce Arrow claimed much more than he would if struck by a Ford. Those times have gone. The make of car is no longer an indication of a man's financial standing. I think that has played a large part in the result; that, plus the fact that the variation in type of car has very largely disappeared—that is, the low priced car has tended to have a great many of the qualities of the high priced ones.

The differential by type of car has practically faded out of the picture. In most of the States, now, it has been eliminated.

MR. EDMUND S. COGSWELL: When we began to get the first statistics we found a great difference in the accident records of the W. X. and Y. cars, and in those days the safest car on the road so far as producing accidents was concerned was the old Model T. For some reason or other those cars didn't get into many accidents, and when they did, the damage wasn't great.

But in recent years we found a tendency for the W. X. and Y. cars to draw together in point of accident expense, and we finally came to the single rate. There was no justification for considering the three classes separately. We found, under the Massachusetts statistics, quite a difference in territories, and today there is still ample justification for the territorial system; but I do think that the rural areas are beginning to come up in their experience and there is some growing together of the cities and the towns, although there is still a very marked difference.

The city of Chelsea still seems to have a pretty bad accident experience.

CHAIRMAN BARBER: What proportion of risks in Massachusetts have to be assigned? Have you any rough idea?

MR. COGSWELL: Oh, it's a comparatively small percentage. Mr. Kulp probably could answer it better than I can. But I'd say under one per cent.

The number of cars this year that have requested to be assigned has not been very large. I think it's under ten thousand. The number was not as great as we anticipated it would be.

MR. ARTHUR H. REEDE: Mr. Cogswell made a statement with regard to assigned risks in Massachusetts. The latest figure I

have (I conversed with some of the people at the Rating Bureau on this question) is about nine thousand. It very closely corroborates his figure.

Incidentally, I think the whole problem of assignment in the State of Massachusetts should be related to two pertinent facts; one is the collapse, about two years ago, of two carriers in the State of Massachusetts, which led to a large reassignment problem, and the other is the fact that they had compulsory coverage in the State of Massachusetts which makes the assignment problem very much more important, probably, than it would be in other States.

PRESIDENT PERRYMAN: I would like to ask a question. Mr. Blanchard has been asking a number of questions, and I'm going to ask him one.

Do you feel that these various plans we have been discussing represent an advance toward getting more equitable rating schemes for the various categories of passenger cars?

MR. BLANCHARD: I think I'd rather not answer it without due thought.

PRESIDENT PERRYMAN: Well, what I had in mind was this: the fact is that we do not, or did not, have enough flexibility in our rates. We had, until recently, the W. X. and Y. categories, which disappeared. Experience came closer together, and in fact there are practically no differentials now shown to distinguish between them. Yet it was felt, not only by people in the insurance business but by the man on the street, that there was some need for differentials between various automobiles.

You'd have a man driving twenty-five thousand or more miles a year—and the man next door to him taking his car out only once a week and perhaps driving two or three thousand miles a year. As a matter of fact, my next door neighbor bought a car in 1933 or '34 about the same time as I bought one. I have had two or three since then and he's still got that car and hasn't gone ten thousand miles on it yet.

The natural thing would be for the man in the street to say, "Shouldn't there be some recognition given to that? Why do I have to pay the same as the man next door to me? There seems to be an obvious difference in the risk, yet the insurance companies want to charge us all the same."

My question was: Are we making any progress with these rating plans? Do they represent a real advance toward getting some proper differentials, or are these plans merely a flare-up of competitive conditions, etc.?

MR. BLANCHARD: Mr. Perryman, while you were talking I have had a chance to think.

I'd like to say just this much, that I think the fact this whole question has been brought up and the experiments are being made is a thoroughly good thing, and I think it will represent a definite advance provided the experience data kept on these various types of plans are kept in such a way that later the plans can be either abandoned or adjusted so that they will be equitable.

CHAIRMAN BARBER: Mr. President, I think that the subject has been fairly well discussed, and there appear to be no other remarks.

THE EDITOR'S VERSION OF THE INFORMAL DISCUSSION

Ralph Blanchard, the lawful possessor
Of the dignified title, professor,
Advanced wise suggestions
And asked many questions
To which no one dared to say "yes, sir."

Charlie Haugh with his Hitler mustache
Arose to his feet in a flash
To untangle the maze
Of the devious ways
Of stock carriers hunting for cash.

The eminent F. Stuart Brown
Remarked with a terrible frown
That experience rating
Was not just rebating
But a good way to nail business down.

Ham Barber advanced the wise thought
That the age of the driver be sought.
Those of more ancient vintage
A higher percintage
Of losses would show, so he thought.

The tall figure of H. O. Van Tuyl
Arose to his feet with a smile.
He considered it sage
To rate by the age
Of the driver, or else by the mile.

Al Guertin then pleaded for mercy
For the sorrowing sons of New Jersey,
Who, so he averred,
Simply can't get insured,
Which awakens much sharp controversy.

Ed Cogswell recounted with glee
That the trusty and tried model T
Was the safest to pass
On the highways of Mass.
Where insurance is *com*pulso*ry*.

So the good actuarial crew
Voiced opinions and thoughts not a few.
Charlie Haugh made ten speeches,
But of peace were no breaches,
And after a while we got through.

REVIEWS OF PUBLICATIONS

CLARENCE A. KULP, BOOK REVIEW EDITOR

Actuarial Technique and Financial Organization of Social Insurance, Compulsory Pension Insurance. Lucien Feraud, International Labour Office, Geneva, 1940. Studies and Reports, Series M (Social Insurance), No. 17. Pp. vi, 568.

Mr. Feraud's treatise on compulsory pension insurance, including his discussions of invalidity and dependents' insurance, adds much to the available information on the actuarial and financial aspects of these programs in 6 countries.

It brings into one volume about half as long as *Gone with the Wind* or *Anthony Adverse* so much of factual data on mortality, morbidity, age distributions of the insured populations, family composition, the relative ages of husbands and wives, invalidity rates, mortality rates among the disabled, that the demographic section should interest the Bureau of the Census and students of population as much as social planners and life and casualty actuaries.

His observations on reserves should be read by those who are resting from past debates. His sober observations on finance are drawn from actuarial textbooks as well as statements of the various national authorities. For good measure, he sums up the conclusions on investment of social security funds from the ILO Report No. 16 in the same series.

The terminology is consistent with other ILO reports but the actuarial symbols of the respective countries have not been very much regimented.

His detailed grasp of these 6 systems has come from adequate study and competent organization of material. It is much more than a reference book; it is source material for social security understanding.

W. R. WILLIAMSON

The Agents Key to Fire Insurance. Robert P. Barbour. Fifth edition. The Spectator, Philadelphia, 1939. Pp. 616.

The Agents Key to Fire Insurance is a useful compendium of information on fire insurance, with emphasis on stock companies and on agents and brokers. The greater part of the book (348

pages) is devoted to the reproduction of forms used to modify the standard policy, and to some brief discussion of their uses. The multiplicity of these forms is illustrative of the problems and manner of thinking to be found in the fire insurance field.

While this book is valuable for reference purposes to persons engaged in the fire insurance business, it will not be of great interest to casualty actuaries. Rates and rating methods are covered in 3 pages and reserves are allotted 7 lines. The chapter on selection and inspection states in brief compass the underwriting philosophy of fire insurance, and Chapters 15, 16, and 17, which outline the covers written by fire and marine companies, serve to define the field of these carriers. The chapter on losses vividly illustrates the difficulties arising from the practice of writing several policies to cover a single risk, in whole or in part.

The casualty insurance actuary, trained to think in terms of statistics, pure premiums and reasonably exact mathematics, will find himself in a strange land if he studies fire insurance. This volume would serve to give him a good elementary notion of its geography.

RALPH H. BLANCHARD

Boiler and Machinery Insurance. James H. Coburn and Dale F. Reese. Travelers Indemnity Company and Hartford Steam Boiler Inspection and Insurance Company, Hartford, 1940. Pamphlet, pp. 75.

Use and Occupancy. Boiler and Machinery Coverage. J. Victor Herd, Reginald Fleming, James H. Coburn. American Management Association, New York City, 1939. Insurance Series, No. 34. Pamphlet. Pp. 19.

These publications, in different ways, offer the casualty student materials for study and thought in a field in which they have been none too plentiful. The Coburn-Reese treatise represents the New York Insurance Society Lectures on this subject revised to March 1, 1940. This is not only an excellent little text, it is the only text in its subject. More than half the pages are given to reproductions of policy and other forms and of excellent photographs and diagrams of insured objects.

The point of view in this pamphlet is essentially descriptive.

This works out well enough in the sections on history and policy contract. But one result is that the sections on statistics and rate-making are over-brief: the two together make up a single page only. Subjects such as the last are essentially different from that of policy forms; the purely descriptive approach, particularly when it is applied as summarily as here, is hardly suitable. Such a statement, for example, as the following, says either too much or too little. "Rate changes are not an annual or even a periodic procedure in the boiler and machinery lines. There are various reasons why this cannot and should not be." It is true that a short statement in support follows but 21 lines are hardly adequate, particularly as they come from experienced men to students. A statement that smacks even more of *ex cathedra* is this: "The days of simplicity in insurance rating are gone." Perhaps. It can be argued that increasing hazard-complexity in other lines has been accompanied by a simpler manual and a simpler *basic* rate structure. The assumption of the authors and of the loss-ratio rate-system they are assuming is that *all* hazard factors have to be included in basic premium. It is at least arguable that the more hazard-factors particularly minor that are included in basic premium the less it adheres to insurance principles. The authors suggest some such possibility in their reference to the elasticity of the rate structure.

The second publication cited above approaches the subject of boiler and machinery insurance (the first section, on fire use and occupancy, provides parallels with casualty) quite differently. This is a transcript of the proceedings of the 1939 Atlantic City Insurance Conference of the American Management Association. Both buyers and sellers of insurance are represented in these conferences and the result has a cast very different from that of any lectures however competent *per se*. Here the customer has a chance to talk back, indeed he seems sometimes to talk out first and the insurance man talks back. Sometimes the customer may be wrong in his facts or interpretations; for example, Mr. Fleming confuses loss to parts as a result of wear-and-tear and loss resulting from worn-and-torn parts. Usually the question-answer period that follows the set paper can be counted on to clear up such mistakes, but for some reason, Mr. Coburn, who followed Mr. Fleming, made no comment on this at all. As is inevitable, even

in the printed (and I assume edited) report the minds do not always meet: Mr. Fleming, for instance, suggests a blanket policy and in the same breath complains that rates are too high. Still Mr. Coburn does not point out the intimate relationship between the two, indeed he suggests without further comment that the companies are working on a blanket cover. But this method of spreading insurance knowledge, particularly *inter pares,* is very effective. One does not have to go to quite the lengths of the forthright Mr. Fleming to appreciate its advantages.

C. A. KULP

The Case Against Experience Rating in Unemployment Compensation. Richard A. Lester and Charles V. Kidd. Industrial Relations Counselors, Inc., New York, 1939. Pp. 59.

This is the second monograph published by the Industrial Relations Counselors on experience rating in unemployment compensation. The first was *The Case for Experience Rating in Unemployment Compensation* by Herman Feldman and Donald M. Smith, reviewed in the November, 1939, issue of the *Proceedings.*

I must confess that a reading of *The Case for Experience Rating* left me an inclination to oppose experience rating while *The Case Against Experience Rating* has left an inclination to favor it. In each instance the case has been overstated.

Part of the authors' opposition to experience rating appears to arise from an incomplete acquaintance with the *rationale* of experience rating. What the authors understand by the term *experience rating* is what technicians would call *prospective rating;* there is no indication that they are aware of what technicians would term *retrospective rating.* An essential element of prospective rating is the idea of continuity in experience; that is, that a group with a low claim rate in one period will tend to have a low claim rate in the following period, and that a rate credit should be granted on the basis of this expectation. In retrospective rating, on the other hand, there is no such idea of continuity. A dividend is allowed because of favorable past experience without any assumption as to future experience. The fact that this dividend is frequently applied to reduce future premiums instead of being paid in a lump sum is not sufficient to change the basis from retrospective to prospective. The distinction between prospective and

retrospective rating is in the manner in which the rate credit or debit is determined, not in the manner in which it is applied after being determined. In order to operate a prospective rating plan it would be necessary to investigate the correlation between the claim rates of individual groups in successive periods of time. To my knowledge this has never been done, and there are no prospective rating plans in existence to-day in any line of insurance though there are apply-dividends-to-reduce-future-premiums plans. A complete answer to the authors' argument that experience rating is undesirable because future experience is unpredictable or because particular business organizations may cease to exist in the future is the retrospective rating plan; it involves no assumptions as to the future experience of any particular risk if the dividend is paid in cash. However, an essential element of a retrospective plan is a "gross premium" rate for every group as high as the rate which the group with the worst experience should pay; there can be no retroactive increases in rates.

To the familiar argument that experience rating will tend to produce stabilization of employment, the authors reply, in effect, that stabilization may not be socially desirable. On a given rate of unemployment it may be preferable to rotate employment rather than to employ one group continuously and to leave the remainder continuously unemployed. Continuous unemployment tends to result in an unemployable class through loss of particular skills or by psychological changes. This reply merits thoughtful consideration.

To the argument that experience rating tends to allocate the cost of unemployment to the product produced, the authors reply, in effect, that it is difficult or impossible to say how much of the cost should be attributed to each product. I do not find their arguments very convincing. In no line of insurance does experience rating accomplish anything more than a rough sort of justice in allocating costs and perfection is not to be expected in its application to unemployment compensation. Failure to achieve perfection should not lead us to reject everything short of perfection. I think it will be admitted that the production of luxury goods involves more unemployment than the production of necessities, and that the cost of unemployment in the production of luxury goods should be paid by the consumers of luxury goods.

To the argument that experience rating tends to prevent abuse of the unemployment benefit system by employers who might arrange employment in such a way that employees could receive a maximum of benefits, the authors reply that perhaps after all this may not be an abuse.

The authors are not inclined to emphasize the administrative awkwardness of experience rating. Neither do they point out the dangers of a discretionary rating plan in the hands of bureaucrats.

My opinion is that the question of experience rating in unemployment compensation cannot be satisfactorily settled by *a priori* argument. A trial under reasonable conditions is necessary before a final decision can be made.

J. B. GLENN

Financial Analysis of American Stock Fire Insurance Companies from 1926 to 1936 inclusive. Robert Baker Mitchell. Privately printed, Philadelphia, 1939. Pp. viii, 185.

This doctoral dissertation at the University of Pennsylvania presents an interesting analysis of the financial aspects of the operations of 20 companies, 10 independent and 10 operating as members of fleets. Some of the companies listed as "independent" have casualty running mates or another closely associated company, though not operating on a fleet basis.

The author's point of view seems to be that of a stockholder or prospective investor and the analysis seems better fitted to yield the type of information desired by such a person than by a prospective policyholder. For example, the author says (p. 55) "All these states" (named just before) "have a 45 per cent or better loss ratio, which is generally considered as the upper limit if the company is to make a fair return on the premiums received" and expresses no dissent from that general agreement. When the policyholder over a 10-year period pays for the *service of loss distribution* nearly 25 per cent more than his contribution to losses, it seems to this reviewer that the institution can hardly claim much for the efficiency of its service. I question whether thoughtful company managers in the present juncture of our economic institutions and the attacks on "the profit motive" regard condi-

tions which require such low loss ratios in order to permit a profit as really healthy.

Again the author does not seem to see incongruity between the cost to policyholders and the fact that "the average annual profits from all sources and for all the companies in the group approximated 9.7 per cent of the average annual adjusted net worth for the period." Perhaps this reviewer, with his long period of association with workmen's compensation rate-making, has been too much affected by the notion expressed by Justice McKenna in 1915 (*German Alliance* vs. *Lewis*, 233 U. S. 389) that insurance is a business affected with a public interest.

The author criticizes the system of accounting of our convention statement forms as not conforming to modern accounting practice, particularly in the requirement of a pro rata unearned premium reserve. Here he is on solid ground from one point of view, that is that the operating ratios are distorted, but he seems to overlook the fact that the pro rata reserve is a statutory requirement and the purpose of the statement is to ascertain whether policyholders' interests are adequately protected.

He is also on solid ground when he criticizes the practice of some companies which included as liabilities reserves for future contingencies. He contends these are a part of surplus even though appropriated for special use. He does not so consider a reserve set up for the difference between convention and market values, because he says this is not a provision for future changes but a recognition of an actual market condition. This seems to make a great deal depend on what the reserve is called.

In his study he has accordingly adjusted underwriting expense, and hence underwriting profit and net worth to conform to his concept of proper accounting.

The criteria used in the analysis are: (1) loss ratio on an earned-incurred basis, (2) ratio of underwriting profit to premiums earned, (3) ratio of investment profits to average admitted assets, (4) ratio of profits to adjusted net worth, (5) ratio of policyholders' surplus to liabilities.

These ratios are computed for each company studied and the loss ratios separately by lines. Full data are given in the appendices and there is a chapter devoted to each with charts showing their average trends over the period and comparisons between the averages for the two types of companies.

In view of the period the actual finding may be less interesting than the technique and the questions raised as to proper accounting procedure, questions similar in nature to some raised in respect to life insurance by the T.N.E.C. Is it, perhaps, not time for the actuarial bodies and the insurance accountants' organizations to consider with the association of insurance commissioners the matter of revision of accounting procedure and statement blanks in toto?

A. H. MOWBRAY

Fire Insurance Inspection and Underwriting. Charles C. Dominge and Walter O. Lincoln. The Spectator Company, New York, 1939. Fifth Edition. Pp. 1072.

Abaca, the first word, to *Zymone,* the last word, that is, from manila hemp to the residue of the gluten of wheat, represents the range of the fifth edition of *Fire Insurance Inspection and Underwriting,* a handbook of encyclopedic information that contains 1072 pages and 200 illustrations.

The authors have been at work on this present volume since 1929. The results will prove useful not only to fire insurance inspectors and underwriters but also to casualty inspectors, industrial engineers, architects and all others who are engaged in the conservation of men and materials.

The latest edition follows closely the pattern of its predecessor. The subject matter is alphabetically arranged and adequately cross-referenced. The descriptions are simple, direct and non-technical; the book will therefore be of equal value as a textbook for the beginner and as a reference book for the expert.

More than 5,200 subjects have been treated: these include the common and special hazards of most manufacturing processes. Information is also presented on the storage and handling of materials and the salvage possibilities of stocks that are susceptible to fire damage. There are: data on types of building construction; information on special forms of insurance as rent, leasehold and use and occupancy; descriptions of many of the more hazardous chemicals. There are also descriptions of some of the more important fires and the lessons in prevention that were learned from their investigation.

Fire Insurance Inspection and Underwriting is a book that should be in the library of anyone who is concerned with fire or accident prevention.

ALBERT W. WHITNEY

Insurance Tax Laws. Harrison Law. Privately printed, Nutley, N. J., 1939. Pamphlet, pp. 78.

This pamphlet contains a reproduction of the general tax laws applicable to insurance companies in the several states, the Dominion of Canada and the Canadian provinces. In some cases these are literal reproductions, taken from the laws; in other cases the reproduction is by summary. There are two tables in the early part of the pamphlet, one applying to fire companies, the other to "liability companies." The author has not indicated as carefully as he should what he purports to cover and it seems necessary therefore to point out that it is not a complete work in the following particulars:

(a) There is no mention of Federal taxation.

(b) Taxation of life companies appears to be covered only in cases where the taxation of life companies is on the same basis as the taxation of other companies. If for instance reference is made to the laws of Massachusetts and New Hampshire, it will be seen that no mention whatever is made of the taxation of life companies.

(c) There is no mention of taxes imposed under laws other than the general insurance laws; as for instance the taxes imposed in a number of states by the compensation acts on compensation insurance premiums: in some cases to meet the expenses of administering the acts, in other cases to build up special funds.

(d) The pamphlet seems hardly complete with respect to fees, which are a form of taxation and which aggregate very considerable sums.

Hence the work is somewhat less comprehensive than its title would indicate.

The writer has not undertaken to test the accuracy of the work, either in transcription or in abridgement. It is a kind of work which, as the writer knows by painful experience, is very difficult to do without error. The author's caution in the foreword to read

the law may be expanded a little into a caution applicable not merely to this, but to every work: to refer where possible to the officially published laws. There is always the chance of error, and a much more proximate chance of the law having been changed. There have been a number of legislatures in session since 1939.

With all this it should be added that the author's attempt to bring together the taxation laws within the compass of a moderate-sized pamphlet is a worthy endeavor to present a picture which needs to be contemplated more carefully than it often is: the picture of the manifold ways in which insurance tills are tapped in the behalf of governmental bodies, and the way in which, through the operation of retaliatory laws, this may load the companies of a particular state with a very serious competitive handicap. It is hoped that the author will regard the points taken above as constructive criticisms. He certainly cannot be oblivious of the fact that a pamphlet like this is good but for a limited period and requires revision at fairly frequent intervals. If enlarged along the lines indicated, it might become a valuable working tool for the insurer.

CLARENCE W. HOBBS

The Investment of the Funds of Social Insurance Institutions. International Labour Office, Geneva, 1939. Studies and Reports, Series M (Social Insurance), No. 16. Pp. viii, 196.

This report by the International Labour Office as Series M, No. 16, should be of considerable interest in the United States, where one of the most controversial questions of the New Deal was concerned with reserves under old-age insurance.

This report explicitly avoids discussing the desirability of reserves, but since "a great many social insurance institutions have to administer funds of considerable magnitude" the subject is considered a very practical one.

The preface states that "the purpose of these funds or reserves is either to ensure that the interest earned on the accumulated capital will maintain the financial balance of the insurance scheme (by means of technical or actuarial reserves) or to avoid certain fluctuations in the rate of contribution owing to unforeseen events (by means of contingencies reserves)." The report is based on

replies to a questionnaire drawn up at a preliminary meeting of experts, with a second meeting to review the replies.

The social insurance surveys of the International Labour Office have to a considerable extent accepted the concept of accruing liability as developed in pension funds, in which liability accrues as service is given and money collected in advance is banked with a certain degree of pooling against future demands. In this country such writers as Miles Menander Dawson, in an early report to the International Congress of Actuaries; and Mr. Albert Linton and Mr. R. A. Hohaus, in papers presented to the Actuarial Society of America, have set forth an economic analysis of old-age benefits rather different from the general assumptions of the International Labour Office.

The pay-as-you-go philosophy of collecting contributions from active workers to pay directly to retired individuals, as payments are due, is rather an advanced one. It has not been completely accepted even in the United States:

(a) Because the income from interest returns will be lacking, and the ultimate contributions will seem higher;

(b) Because early outlays are much greater under a comprehensive pay-as-you-go plan;

(c) Because paying more for immediate benefits, less funds are available for other important governmental requirements.

The countries contributing to the ILO discussion on the basis of their own programs include France, Great Britain, Belgium, Poland; methods of operation in Germany, Czechoslovakia, the Netherlands and Sweden are also discussed. One might question for some of these countries the advantage to insured persons of collecting the money in advance in order to spend it for other purposes.

Most earnest research work is evident on the part of the ILO. The discussion of safety, yield, liquidity, social and economic utility is sound but since all these investments are so completely tied up with the national well-being one may question the realism of the study. If a country has any prospect of continuity, if it is to gain in productive capacity, the allocation of its general resources initially to other purposes but ultimately to the requirements of social insurance would seem suitable, honorable and constructive. If it has no belief in a continuing sound economic order,

the investment in any type of securities would seem to assure very little to the aged, the unemployed or the sick.

The report aims at complete objectivity but to be able to draw useful conclusions the conditions surrounding each social insurance enterprise in each country must be understood.

W. R. WILLIAMSON

Law's Comparative Tables of Casualty and Surety Insurance Companies 1940. Harrison Law. Published by author, Nutley, N. J., 1940. Pamphlet, unpaged (pp. 28).

Mr. Law claims in a foreword that he is presenting "statistics found in no other publication." He adds that "there are many charts showing the monetary items but none that give you the specific items of all companies as a unit for comparison with a ratio of each item." Both statements are essentially correct. The author has succeeded in compressing within a very few pages a really amazing amount of ready-to-use information, including some (income-disbursement analysis for example) that is not available in this form in standard sources. His claim to uniqueness however depends even more on the novel arrangement of data permitted by his oversize page. It is extraordinarily helpful to be able to find on a single page comparable statistics for no fewer than 100 companies.

The companies are selected entirely from those writing in New Jersey but they are a comprehensive group nonetheless. The list is strongest in stocks, of whom there are 70; but the 17 mutuals include all the large general-writing companies and the principal foreign and reinsurance carriers. Mr. Law does not use these heads (as he foregoes many another mechanical feature that would simplify matters considerably) but he has in fact arranged his exhibits in 3 categories: (1) underwriting results, (2) income-disbursements analysis, and (3) balance sheet analysis. Results are shown separately for each company; usually they are averaged also for all companies within its group (e.g.: stocks, mutuals, etc.).

This attempt of Mr. Law's to reduce *multum* to *parvo* has been so successful in many ways that one asks for even more. In his exhibits based on net paid premiums, for example, he does not carry out his promise to show original figures. His data, with two

exceptions, are for a single year, 1939. How much more useful would a 5-year spread be, and decidedly worthwhile at the cost of a few more pages. In one important respect Mr. Law omits entirely highly significant data: analysis of *earned premiums by lines.* His analysis of earned premiums is for all casualty and surety lines together; his analysis of loss and expense ratios is limited to losses and commissions paid and is based on net premiums *written.*

An important, and a quite unnecessary flaw in the Law tables, one that causes the careful reader hours of wasted labor, is the general failure to define terms. For example, he uses the simple term, *premium,* in 3 different senses in 3 tables: to mean gross written (page 5), to mean earned (page 9), to mean net written (page 12). Incidentally, his use of the expression, *net premiums,* (page 5) is incorrect. In the Law tables this expression is taken to mean gross premiums less premiums on policies not taken and cancellations, but including reinsurance premiums. The table titles also leave much to be desired. One called, *Capital, Surplus and Unearned Premium* in fact includes also figures for book or liquidating value total and per share, par value per share and the dividend rate. While a sub-title uses the expression, *book value,* the relevant column in the table reads, *liquidating value.* On page 4 appears the title, *Five-year average,* and 6 columns of ratios. Says the reader to himself: average of what, and for which 5 years? He is probably correct in assuming that this table summarizes for the entire period the annual results on the preceding two pages. But why must he assume? These flaws may seem a case of the reviewer's mote, but when accuracy and consistency are so easily achieved why not so arrange?

The tabulation that follows is an attempt to summarize the scope and content of the Law tables. The language throughout, unless shown in parentheses or otherwise specifically noted, is that of the author. The second kind of deviation is illustrated in the attempt at a more accurate rendering of the general expression, *premium,* as shown in notes 2 and 4 below. The order of the tabulations here likewise has been rearranged in the interest of more logical grouping. The period covered by a single year is always 1939; multi-year results are for the period inclusive of 1939.

UNDERWRITING RESULTS

	Number years	Original data given?	Ratio (to basic figure in italics)?
Net paid premiums, all casualty and surety	5	no	...(1)
Loss and loss expense paid	5	no	yes
Agency and brokerage paid	5	no	yes
Salaries paid	5	no	yes
Taxes and fees paid	5	no	yes
Other underwriting disbursements paid	5	no	yes
Total underwriting disbursements paid	5	no	yes

(1) Ratios shown for each of the 5 years and for the entire period in this section.

	Number years	Original data given?	Ratio (to basic figure in italics)?
Gross premiums written, all casualty and surety(2)	1	yes	...
Not taken	1	yes	yes
Cancellations	1	yes	yes
Reinsurance	1	yes	...(3)
Net premiums written, by lines			
(15 lines including miscellaneous)(4)	1	yes	...
Commissions paid	1	yes	yes
Losses paid	1	yes	yes
Loss expense	1	yes	yes(5)
Earned premiums, all casualty and surety lines(6)	1	yes	...
Incurred loss	2	yes	yes

(2) Titled *Premiums* in original.

(3) Ratio to gross premiums less not taken and cancellations.

(4) Titled *Premiums* in original. Totals and averages for all lines shown also in this section.

(5) Ratio of loss expense to losses paid also given.

(6) Table titled: *Premiums and losses since Organization or Admittance to U. S.* presumably also on earned premiums and incurred loss basis.

INCOME-DISBURSEMENTS RESULTS

	Number years	Original data given?	Ratio (to basic figure in italics)?
Total income, all casualty and surety	1	yes	...
Premiums	1	yes	no
Interest and rents	1	yes	no
Other income	1	yes	no
Surplus paid in	1	yes	no
Assets sale—increase	1	yes	no
Total disbursements, all casualty and surety	1	yes	...
Underwriting	1	yes	no
Non-underwriting	1	yes	no
Taxes and fees	1	yes	no
Dividends	1	yes	no
Assets sale—loss, decrease	1	yes	no

BALANCE SHEET ANALYSIS

	Number years	Original data given?	Ratio (to basic figure in italics)?
Capital	1	yes	...
Surplus and special reserve	1	yes	no
Unearned premium	1	yes	no
Liquidating value[7]	1	yes	yes
Par (per share)	1	yes	...
(Liquidating) value (per share)	1	yes	yes
Dividend rate	1	yes	...
Assets	1	yes	...
Liabilities	1	yes	yes

(7) Total of capital, surplus and special reserve and 25 per cent of unearned premiums.

C. A. KULP.

Life Insurance Lapsation in Utah. A Case Study of 5,048 Households. Irvin Hull. Published by the author, Salt Lake City, 1939. Pp. 146.

This dissertation was submitted by the author as one of the requirements in his pursuit of the degree of Doctor of Philosophy. Through the cooperation of Federal Project workers it contains a very considerable mass of data relating to a presumably representative sample of the urban and small-town population of Utah. In the approximately 5,000 households investigated, insurance and annuity contracts and certificates of all sorts slightly exceeded 17,000, reported as of January 1, 1935, including those still in force and those discontinued within an 11-year period.

Since this material is so inclusive, embracing alike annuities, endowments, group certificates and the coverage afforded by fraternal orders and benevolent associations, mass averages show little or nothing, while the difficulty of breaking the material down into homogeneous groups is obvious. The author has not always helped the reader to avoid confusion by the classifications he adopts. For example, in one statement it appears that all group certificates are lumped with the legal reserve life plans. This may account in part for the amazingly insignificant proportion of term insurance found in force. Again, this may be in part responsible for the surprising conclusion that annual premium business is subject to the highest rate of lapse.

In other respects the conclusions are such as would be arrived at from a general knowledge of the business without any special investigation. This may be indicated by quoting the author's summary in two sentences not believed to be extreme examples: "Likewise, as the average annual household net income increased, the extent of life insurance coverage also increased. By contrast, the relative proportion of lapsation decreased with the increase in income, skill and professional training of the household head." Certainly, his conclusion that better company representation results in better persistency will hardly be questioned, or that this better representation tends to be found in larger centers.

Most of the recommendations based on his findings, which are addressed alike to the public interest and to the operating companies, are similarly unexceptionable. One example must suffice: "It is recommended that the agents be instructed and encouraged to counsel the life insurance purchaser to buy life insurance in keeping not only with his current income, but also in line with his average and prospective income."

The high rate of discontinuance in life insurance has caused concern to every thoughtful student of the subject ever since American life insurance really got started. It is not surprising that a study conducted in the depths of the depression can add little or nothing to one's knowledge of the subject. It is perhaps unfortunate that the author does not discuss the advantages derived through cash surrender values by some families which found these their only source of emergency relief when economic disaster overtook them.

HENRY H. JACKSON

Law and Contemporary Problems. Medical Care. School of Law, Duke University, Autumn 1939. Volume VI, No. 4. Pp. 495-677.

This volume contains another of the valuable Duke Law School symposia on subjects of current interest. The 14 articles deal with various aspects of medical care from the social, economic and legal viewpoints. Much valuable history is given and in fact it might well be said that the volume is the best up-to-date textbook on the general subject of medical care. A major criticism is that only one article is contributed by the group who believe that the current system of medical care is quite satisfactory and cannot be improved upon by any form of "health insurance" or "socialized medicine." Perhaps this very omission in a publication of such high caliber may indicate an almost universal belief among those who have studied the matter that there are some problems in medical care which can readily be solved only by changes in the medical system.

The symposium is opened by *An Introduction to National Problems in Medical Care* by I. S. Falk. In this article there is well set down the more important developments in the past in regard to the solution of the problem of national medical care, as well as a good statement of social objectives and an answer to the individualistic view of the medical profession (most frequently expressed by the American Medical Association). The problem of the individual in facing the medical care question is also analyzed.

The article on *American Experimentation in Meeting Medical Needs by Voluntary Action* by Martin W. Brown deals with the development of voluntary plans, most of which have been among employees of industrial corporations. Detailed descriptions are given of 8 plans which differ in respect to method of financing, membership, service provided and administration. The author comes to the conclusion that benefits should be in medical care rather than cash reimbursement to defray medical expenses, and that the services should be rendered by a group of full-time salaried physicians operating as a unit rather than by individual doctors maintaining separate offices and operating on a fee basis. It is pointed out that the A.M.A. takes the opposite position, although many prominent physicians disagree.

Ethical and Legal Restrictions on Contract and Corporate Practice of Medicine by Joseph Laufer analyzes the history and present status of restraints set up against these forms of medical practice. The dual system of control as exercised on the one hand by the A. M. A. and on the other by the courts has in the past worked hand in hand, with the latter in most cases upholding the rulings of the former. The author believes that the rigid control of the A. M. A. over contract and corporate medical practice was necessary in the past in order to eliminate quackery but that now the legislatures and courts should recognize that a new situation exists which had not been planned for in earlier laws. Even though no legislative changes are made, the courts should consider laws regulating medical practice in a broad light so that they may still be invoked against anti-social activities and yet not become oppressive to desirable experimentation.

C. Rufus Rorem in his article on *Enabling Legislation for Non-Profit Hospital Service Plans* traces the development of state legislation permitting the operation of such plans. These laws are necessary because in all but a handful of states these plans are considered to be insurance and otherwise can be offered only by stock or mutual companies which fulfill the various requirements. In order to meet the unusual conditions of a hospital service program, half of the states have passed enabling acts in the last 5 years. Features of the different laws are analyzed and a model bill is shown. The next article on *The Michigan Enabling Act for Non-Profit Medical Care Plans* by William J. Burns traces in detail the preliminary study and the resulting legislative history of an enabling act for a particular state.

The article on *Hospital Service Plans: Their Contract Provisions and Administrative Procedures* by Maurice J. Norby makes a comprehensive analysis of the actual working of these plans, including the method of initial organization. The descriptions of the benefits offered and the method of computing the subscription charges will be of special interest to actuaries. He estimates that the membership in these plans has increased from 200,000 at the beginning of 1933 to 5,000,000 at present.

Under the heading, *The Organization of California Physicians' Service,* Hartley F. Peart and Howard Hassard describe the creation of this plan and its method of operation. The service was

organized by the California Medical Association, affiliated with the A. M. A., and is under the control of a small group of physicians. Broad medical services are available to members under the monthly pre-payment plan. To be a member the individual must belong to an organized group and have an income of less than $3,000 per year; no service is available for dependents of members. The medical service is furnished by any physician who wishes to join the plan; the great majority of the California doctors belong. Remuneration is on the basis of units of service performed, the amount paid for each unit depending on the funds available for the month under consideration. The article is a not too subtle rebuttal on behalf of the A. M. A. against the arguments presented in the other articles in favor of governmental or lay control of the distribution of medical care.

The article on *The Medical Care Program for Farm Security Administration Borrowers* by R. C. Williams describes in considerable detail the types of plans set up for low income farm families in various sections of the country. The justification for Governmental entrance into this field is based primarily on the fact that all the participants are borrowers of Federal funds and will undoubtedly be much more likely to make repayment through farm earnings if in good health. The plans are run on a county or district basis so that some experience has been highly satisfactory while other has not, resulting in the termination of some plans. The chief difficulty has been due to the fact that very low payments have been required from the contributors because of their economic status. As a result, when the total funds were divided up among physicians on a pro-rata basis, small settlements resulted. However, in many cases these are more than the physicians had received in the past due to the large proportion of individual bills completely unpaid.

The article on *The Anti-Trust Prosecution against the American Medical Association* by Benjamin D. Raub, Jr. gives the legal history and basis of the prosecution by the Government of the A. M. A. The suit was based on the discrimination exercised by this society against the Group Health Association, which was formed by Government employees in Washington to provide prepayment medical services from salaried physicians.

In the article *The Background of the Wagner National Health Bill,* Harold Maslow surveys the attempts that have been made

since 1910 to develop health reform legislation. The most inclusive bills have not become laws due to the opposition or neutrality of various organizations, but many minor laws have been passed. The Wagner Bill is a continuation of the attempt to institute a fairly thorough degree of completeness in this field. Strong arguments are presented as to the social necessity for such a program, and the criticisms of those opposing this legislation are fairly well refuted.

David F. Cavers discusses what is probably the most important section of the Wagner proposal in his article on *Public Medical Services under Title XIII of the National Health Bill.* The provisions of this title are very broad (and vague) as to the medical benefits to be offered and the cost thereof to the Federal Government. Grants-in-aid to the various states are to be given so as to extend and improve medical care. The approved programs may range anywhere from a strengthening of the present system of giving medical attention to the needy to a universal health insurance plan providing all medical service and hospitalization, depending upon the action taken by the individual states. The proposed appropriation for the first year is $35,000,000; thereafter there is authorized a sum sufficient to carry out the purposes of this title.

The article on *Legislative Proposals for Compulsory Health Insurance* by Louis S. Reed gives a summary of the provisions of the 4 most important types of bills which have been introduced into the various state legislatures. Under the Wagner Bill all of these plans would probably qualify for federal grants. Each provides for compulsory health insurance for the working population and dependents with certain limitations as to income. It is brought out that the various proposals would have the direct effect of establishing systems providing for medical care on an insurance basis and the indirect effect of developing higher medical efficiency as the result of group practice in contrast to the present individual method.

The article on *Some Problems in the Formulation of a Disability Insurance Program* by I. S. Falk, L. S. Reed and B. S. Sanders analyzes the practical aspects of inaugurating a disability system (including temporary disability and permanent invalidity). Of particular interest to the actuary are the cost estimates and the

supporting data. The authors first take up the need for disability insurance based on a considerable amount of data showing the severity of sickness. The various necessary specifications regarding coverage, definition of disability, rates of benefits, waiting period and benefit period are briefly analyzed. The point might be raised that insufficient discussion is given to the difficulty of determining disability. The authors estimate that the cost of temporary disability would be about 1 per cent of payroll and for permanent total invalidity insurance a like amount. It is stated that "Some actuarial estimates place the cost, after 40 years, as high as 1⅓ per cent of payroll." Most actuaries will undoubtedly think that this figure is decidedly low as a possible maximum. In testimony before a Congressional committee the Actuarial Consultant to the Social Security Board presented cost estimates from which it can be derived that the cost of disability benefits in 1955, only 15 years hence, might range from ¾ per cent of payroll to 2½ per cent, depending upon the assumptions used.

The article on *A Study of the Formulae for Grants-in-Aid in the Wagner Bill* by Clarence Heer discusses methods of determining the amount of grants to states as proposed in this bill. There are a number of bases of allotment: population, the number of individuals needing health services, births, financial resources, hospitals, etc. In order to receive the maximum grant a given state will have to raise a certain amount of money to match the federal funds, such amount depending inversely on the average per capita income of the state. The formulae and resulting calculations are quite interesting to one mathematically minded. The approach is quite different from the 50-50 matching basis of the public assistance programs of the Social Security Act and represents what many people consider a desirable trend in grants-in-aid.

Probably the great majority of readers will be convinced that the purposes of the Wagner Health Bill are praiseworthy and socially desirable and necessary. Some might still feel unconvinced that such a program could be efficiently administered unless it were inaugurated gradually instead of all at one time. On the other hand, it may well be argued that until and unless such a broad program is instituted no data of real value can be obtained. Most important question of all may well be that of the desirability of attempting to levy more taxes at the present time when tax

machinery has not yet been adjusted to the existing programs and when existing programs are not yet fully functioning in any major field.

ROBERT J. MYERS

Municipal Insurance Costs and Practices: A Summary of Available Data. Hilliard B. Wilson. The American Municipal Association, Chicago, 1939. Report No. 132. Pp. 51.

This is a report on a series of studies of municipal insurance administration and costs among municipalities in 9 states in different parts of the country (a fairly representative sample) conducted partly by staff members of the Association and partly by others. Some of them have been separately published. Section 1 deals with *Fire Insurance.*

In his introduction the executive director of the Association, Earl D. Mallery, says: "This report contains factual data leading to one important conclusion—that American municipalities, on the whole, are paying too much for insurance of municipal risk. Heretofore that fact has long been suspected, but has been supported by the necessary data in only a scattered number of instances." He says earlier: "Fire insurance companies and state insurance departments seldom keep records of premiums paid or losses incurred for individual classes of risks." This is a very sweeping statement which, however, is difficult of disproof because of the lack of standardized classes. He elaborates this with the statement that: "Cost experience data on municipal properties are consolidated with all public properties and in many cases with all mercantile properties."

Since the total premiums for 214 municipalities in 6 states, plus state-wide premiums for municipalities in New Mexico, South Dakota and Texas (covering a period of 12 years in Minnesota, 9 in New Mexico, 5 in Texas, and 10 in each of the other 6 states) are only $2,449,455, the lack of separate classification is understandable by actuaries. However, an overall mean loss ratio of 12.74 per cent with a minimum (state average) of 2.91 per cent in New Mexico and a maximum of 22.65 per cent in Minnesota is not so understandable on the assumption of careful conscientious rate-making, when both the time and space spread involved are considered. Although loss ratios are said to be ratios of losses incurred to premiums paid, the periods covered by the study closed

several years prior to its completion and presumably all premiums are earned.

On the basis of these loss ratios the dogmatic assertion is made: "There is little doubt that insurance is sold too cheaply to poor risks and too dearly to good risks." If that is so, it is a serious indictment of fire insurance rate-making.

Chapter 2 is devoted to suggestions for reducing the cost of fire insurance on municipal properties under the topics: (1) improved practice in placing insurance, (2) rate reductions, (3) self-insurance, (4) partial insurance, (5) no insurance, (6) insuring with State Fund.

Some of the suggestions seem sound. E.g.: "It is true in too many cases that the city official or committee responsible for the placing of insurance is satisfied that the insurance problem is solved when all local insurance agencies have been 'pacified' with 'their slice' of the city's business. A number of other things of more importance are involved in a scientific solution of the insurance problem."

Other statements may be true, but it does not seem to this reviewer they should be. E.g.: "The possibility of an individual city effecting a reduction in insurance rates on the basis of a low loss experience record over a period of years is remote."

The third chapter considers what municipalities can do collectively to reduce insurance costs, under the headings: (1) Preferential rates for municipal property, (2) municipal mutual insurance companies, (3) cooperative insurance plans. Under the latter two heads mutual company experience in England, Belgium and Denmark and cooperative negotiations with private companies in Holland and Saskatchewan are cited.

Section 2 (Chapter 4) deals with surety bonds, principally fidelity, showing the practice of municipalities in bonding officials. This section shows considerable lack of understanding of the theoretical function of suretyship. For example, it criticizes the clause in renewal certificates limiting the aggregate liability to the face of the bond and interprets loss ratios as though the premium were primarily an insurance premium. Has the inspection service of surety companies fallen so low as to be valueless to municipalities? The author advocates change of surety each year to get the benefit of cumulative coverage!

Section 3 (Chapter 5) discusses liability and theft insurance of

motor vehicle equipment, and Section 4 (Chapter 6) robbery and burglary insurance. Neither chapter evinces a very friendly or appreciative spirit toward insurance or insurance companies.

If the past conduct of our business justifies the attitude taken in this study, it would seem time for our executives to look very carefully into the matter.

A. H. MOWBRAY

Non-Profit Hospital Service Plans. C. Rufus Rorem. American Hospital Association, Chicago, 1940. Pp. 130.

This book gives a most thorough historical and factual summary of non-profit hospitalization plans. The great majority of these plans have been approved by the Commission on Hospital Service of the American Hospital Association as meeting its standards. Mr. Rorem, who as Director of this Commission has been active in the movement since its inception, has set down a detailed history of its growth. Although this form of insurance is as yet in its infancy, the author has accomplished the noteworthy task of setting down its fundamentals in concise form. In contrast, the elementary and advanced philosophies of many forms of insurance that have been developed for years are as yet inadequately documented.

The wide variety of benefits available and the rates charged in different cities are analyzed together with the reasons underlying their adoption. In this connection there is an interesting discussion of the statistical basis for determining premium rates. Similarly, the contracts between the association and the hospitals are analyzed, as well as all legal aspects of this form of insurance.

A suggested procedure to be followed in inaugurating a hospitalization program is given, including not only promotion but also subsequent statistical and accounting requirements. The appendix includes a detailed classification of the various accounts that should be set up.

Throughout the book Mr. Rorem emphasizes the unique nature of non-profit hospitalization plans. The dominant factor involved is community welfare rather than profit for stockholders or policyholders as in private insurance. On the other hand, in contrast to compulsory Government health insurance, these programs substitute cooperative self-help and initiative for taxation and paternalism. There should be close cooperation among the hospitals,

the medical profession and the general public. Management efficiency is promoted in the non-profit hospital association through two factors: the expense limitations of the special state laws under which they operate and the competition of private insurance companies. Throughout the text the author fully recognizes the possible dangers to group hospitalization arising from anti-selection and "use" of benefits.

The American Hospital Association has recommended the collection of certain minimum statistical data by the 50-odd approved plans. It is hoped that Dr. Rorem will subsequently analyze the data. In fact, annual statistical reports similar to those published in other fields of insurance would be of great value.

ROBERT J. MYERS

Practical Underwriter's Guide. M. E. Bulske. The Rough Notes Co., Inc., Indianapolis, 1939. Pp. 245.

This book is described by the publishers as "A non-technical ready reference for insurance underwriters, field men, agents and inspectors." The author is chief inspector of an inspection company operating on a countrywide basis and evidently has gained a wide knowledge of industrial processes and of the fire hazards peculiar to various types of risk. The text is thoroughly practical and discusses underwriting matters in the vernacular of insurance and from the standpoint of the company man interested in fire prevention and in the selection of risks that will produce a favorable underwriting experience.

The opening chapter deals with *Underwriting and Rating Fundamentals* and outlines the various factors which need to be considered in determining the desirability of a risk. The second chapter sets forth *Common Hazards* such as electrical hazards, heating and power, poor housekeeping and moral hazard.

Each of the 24 following chapters describes the particular operations and danger points to be checked in connection with a single group of risks. Some of the chapter headings are builders' risks, department stores, hotels, power sewing shops, canning plants, saw mills, foundries, coal mining risks, air conditioning.

Written in an easy familiar idiom, the author bids the reader accompany him on various inspection tours and points out the sources of danger from fire while describing the operations of the

shop or risk. He states that about half of the classes of risks normally written by insurance companies are discussed in this volume and suggests the possibility of covering other classes in a second volume. This supplemental book has since been published under the title *101 Unusual Classes of Risks.*

No effort is made to discuss fire insurance rate-making or the application of rating plans except as occasional reference is made to the granting of credit for individual safety features. Figures and statistics are conspicuous by their absence. There is no space given to the discussion of policy provisions or of loss adjustments. The book makes no pretense of covering the whole realm of fire insurance procedure but it should prove of interest and value to fire insurance men in the field and in underwriting departments who have either the task of inspecting properties for insurance or of deciding on the acceptance of risks and the extent of coverage to be granted.

H. O. VAN TUYL

Probability, Statistics and Truth. Richard von Mises. The Macmillan Company, New York, 1939. Pp. xvi, 323.

This book is a translation from the German of the second edition, published in 1936, of von Mises' *Wahrscheinlichkeit, Statistik und Warheit,* which had already become a classic since its first publication in 1928. The translation has been made by J. Neyman, D. Sholl and E. Rabinowitsch.

This is a treatment of a mathematical subject in a non-mathematical manner. Mathematical formulae are almost entirely omitted. It is intended for non-mathematicians and the author has omitted the treatment of topics which cannot be treated non-mathematically. The mathematical aspects of this subject are treated in the author's *Lectures on the Theory of Probability* (1931).

The book is in the form of a series of 6 lectures in which the author develops his conception of the theory of probability as opposed to the classic approach to this subject. The notion of a *collective* is the basis of von Mises' treatment. According to von Mises "a *collective* means a mass phenomenon or an unlimited sequence of observations fulfilling the two conditions: (i) the relative frequencies of particular attributes of single elements of

the collective tend to fixed limits; (ii) these fixed limits are not affected by any place selection."

The classical definition of probability was given by Laplace in some such form as: "Probability is the ratio of the number of favourable cases to the total number of *equally likely cases*." According to von Mises "the theory of probability deals exclusively with frequencies in long series of observations; it starts with certain given frequencies and derives new ones by means of calculations carried out according to certain established rules." These rules are those of selection, mixing, partition and combination.

From the time his theory was first published it received many criticisms. This book is largely an answer to those criticisms. He points out what he considers the inadequacies of the classic definition, maintaining that a complete logical development of the theory on the basis of the classical definition has seldom been attempted, and that many writers who start out with the "equally likely cases" definition have to abandon it later and adopt the notion of probability which is based on the frequency definition. If you do not do this, he claims, you must omit the application of the theory of probability to such practical subjects as insurance where "equally likely cases" do not exist.

In the first two lectures von Mises develops his theory of probability. According to his theory, the probability of a certain event, for example the throwing of a "5" with an ordinary die, is only a statement of the relative frequency of this result in a sequence of observations. That is, to say that the probability of throwing a "5" with an ordinary die is one-sixth, means that if we make a long sequence of throws of a die we shall throw a "5" in about one-sixth of the cases, and the larger the number of throws the more nearly will the result approach the relative frequency. Moreover, the throwing of the "5" will be *random* in the sense that the relative frequency of "5s" will approximate one-sixth in sequence of observations selected according to some principle such as considering every even-numbered throw, or every fifth, or every tenth throw.

In the third lecture he deals with the criticisms that have been directed against his theory. He is very fair to his opponents. He tries to state their arguments fairly and adequately, and as a result his book is a very readable and worth-while account of the phi-

losophical difficulties of the concept of probability and the practical difficulties of applying it to scientific inference. He first summarizes in concise form the objections he raises to the classical definition of probability and then combats one by one the objections raised to his theory. There is considerable difference of opinion as to how successful he has been. One commentator has said: "It must be admitted that von Mises' opponents have fared no better than he in providing a satisfactory basis for the theory of probability. The difficulties remain unsolved. If he has failed to make out a completely convincing case for his own point of view, he is at least in good company, and this fact by no means detracts from the value of this book."

In the fourth lecture he discusses the so-called *Laws of Large Numbers,* introduced by Bernoulli, Poisson and Bayes. He explains fully the meaning of these laws and the part they play in the calculus of probability based on the frequency definition. He concludes that starting with his frequency definition of probability the meaning of these laws is unambiguous, but if we use the classical concept of probability none of these laws is capable of predictions concerning the results of sequences of observations.

In the fifth and sixth lectures he discusses the applications of the theory to statistics, the theory of errors and the problems of statistical physics, taking into account the recent advances in physics resulting from the development of the quantum theory. These advances he claims are in complete agreement with the fundamental concepts of his theory of probability. He discusses briefly the problems of casuality and determinism.

At the end of the book the author includes about 11 pages of *Notes and Addenda,* giving some 103 references to well-known writers on the subject of probability. This is a very valuable collection of references; and shows the author's extensive knowledge and familiarity with every phase of the subject which he so ably discusses in these lectures.

This book deserves careful reading by everyone interested in the subject of probability. Whether he agrees with the author or not he will certainly benefit by a study of the arguments on the relative merits of the new frequency definition and the classic definition of the theory of probability.

L. A. H. WARREN

Workmen's Compensation Insurance Including Employers' Liability Insurance. Clarence W. Hobbs. McGraw-Hill Book Company, New York, 1940. Pp. xviii, 707.

This volume on the subject of *Workmen's Compensation Insurance* contains 634 pages of material and an appendix covering some additional 35 pages. It is divided into two parts: Part I, 9 chapters, includes as chapter headings—Injuries and Their Prevention; Employers' Liability; Workmen's Compensation; The Historical Development of Workmen's Compensation; Legislative Authority; Employments, Employers and Employees; Injuries Covered by the Compensation Acts; Benefits under Compensation Acts; Administrative Procedure. In these chapters the author develops the history of employers' liability and the evolution from that system to the system of workmen's compensation, and describes in considerable detail the legislative background for compensation laws and the differences in kinds of employees subject to compensation legislation. He discusses also the kinds of accidents which are compensable, the benefits provided by the different states and the administrative procedure by which the acts are enforced. Part II, also with 9 chapters, relates to insurance under the following subject headings: Insurance of Workmen's Compensation Obligation; Organization of Insurance Carriers; The Policy Contract; Reinsurance; The Annual Statement; Rate Regulation and Rating Organizations; Rate Making (two chapters); Application of Rates. The appendix contains illustrations of standard forms of compensation agreements and reports, as well as tables and digests of workmen's compensation law.

The author's original purpose, expressed in the Foreword, was a revision, in the light of interim developments, of the excellent book of the same title by Michelbacher and Nial, published in 1925. The extent of these developments and the complexity of the whole system of work accident compensation led to a volume twice the size of the earlier work. A comparison of the two books marks the change from a social system to a system confused by legislation and legal quibbling, which may in the long run destroy workmen's compensation in the same way that they destroyed employers' liability.

In Part I, the chapter entitled Injuries and Their Prevention is discursive in its treatment and lacks the exact information and

vividness of Downey's book of 1924 or the book of Michelbacher and Nial. Injuries are discussed more or less in bulk, without quantitative analysis of occupations, and hazards are discussed in a general way without regard to their relative importance. The chapters on employers' liability as a forerunner of compensation and the historical development of workmen's compensation could easily have been omitted from the book except by way of reference. Mr. Hobbs' discussion is too general to be of value to the historian and as a result the chapters take up a disproportionate space in the book. The discussions of legislative authority, employments, employers and employees, injuries covered by the compensation acts and benefits, while detailed and historical to a degree, are nevertheless not sufficiently exact for reference purposes. The author does indicate successfully the intricacy of the subject matter, but a student using this book could merely view it as a guide to further study of the laws, court decisions, industries and insurance practices of any particular state. The chapter entitled Administrative Procedure is one of the best chapters in the book. Twenty-five pages are sufficient to furnish some idea of the differing procedures of the various states in the administration of the payment of compensation. Reference is made to the really excellent and exhaustive treatise of Walter F. Dodd.

The first 3 chapters of Part II—Insurance of Workmen's Compensation Obligation, Organization of Insurance Carriers, and The Policy Contract—comprise an extremely detailed but rather elementary review, consuming in all over 100 pages—a disproportionate space, since of necessity exact information on these subjects must be obtained elsewhere. On the contrary, the chapter on Reinsurance is well written, complete and interesting.

The chapter on The Annual Statement covers 30 pages. It might well have been reduced to 4 or 5, so as to present merely a general commentary on the annual statement, possibly supplemented by a discussion of the schedules which pertain specifically to workmen's compensation insurance. As it is now written, it is too detailed for a reader without some previous knowledge of the statement, and it is too brief and lacking in coherent treatment to be of any particular value to those students who might wish to use the chapter as a reference in studying the convention blank.

As the author himself states in the concluding paragraph of the chapter, "The annual statement itself and its many schedules are

deserving of careful study." The references mentioned in the bibliography on the first page of the chapter, together with the appropriate sections of Hull's book on *Casualty Insurance Accounting*, would enable any student who might be interested in a detailed study of the statement, to make such a study with some degree of understanding. The material presented in this chapter is, for the most part, of little value in such a study and could have been confined to the general discussion previously mentioned.

Apart from the criticism that the chapter does not afford any useful purpose, it should be pointed out that there are numerous typographical errors. The most serious errors occur in the tables illustrating the various parts of Schedule P. For example, in Table XXIII there are 5 different errors, the majority of which are so obvious as to be apparent to the most casual observer. Again, in the material describing Schedule P, Part 2, the diagram illustrating the nature of this schedule indicates that 60 per cent of the earned premium is used as a basis for the formula, whereas, of course, the correct figure is 65 per cent. In Table XXV there are also 5 such errors. While these mistakes are not of any great significance, inasmuch as they are used merely for illustrative purposes, they do indicate careless composition.

Although the principal title of the book is *Workmen's Compensation Insurance,* 6 of the 30 pages in the chapter are devoted to the discussion of Schedule P, Parts I and IA, which deal entirely with reserves for liability insurance in general. (Employers' liability is included in Part I only when written in separate policies.) The result is to further confuse the mind of the student in his review of the information presented.

Chapter XV, devoted to Rate Regulation and Rating Organizations, makes several references to the historical development of compensation insurance rates. These references are interesting in bringing to mind old friends—The National Reference Committee, the Augmented Standing Committee and The National Compensation Service Bureau. The conferences of The Augmented Standing Committee did, no doubt, lay the basis for current methods of compensation rate-making, although methods of rate-making have not developed uniformly in all of the states. A sound criticism of these chapters would be that the author does not give sufficient weight to the pioneering value of the independent state bureaus, and it would have been better to entitle

Chapters XVI and XVII, in which rate-making methods are discussed, "Rate-Making by the National Council."

The author describes the rate-making procedure of the National Council but he devotes no space to a description of its shortcomings nor to a discussion of advantageous changes or improvements, and it is unfortunate that this has not been done. Very little space is devoted in the historical outline to the subject of schedule rating, now outmoded, but very important in the development of compensation insurance and, in fact, more important than some of the other historical references accorded quite a little space. An appropriate criticism of the whole description of the rate-making procedure is the absence of a description of the classification system and the underlying reasons for the construction of the classifications. It must be remembered that the most elaborate statistical plan and the most detailed and correct tabulation of experience are necessarily faulty unless the classification system under which they are developed is a logical system.

Mr. Hobbs' book is an excellent illustration of the difficulty of compressing a large subject into a relatively small space—it cannot be done without sacrifice. In this case, the history of the compensation movement went comparatively unsacrificed, to the disadvantage of the chapters on rate-making and present-day problems. There is another problem in a book of this type and that is the difficulty of keeping it sufficiently up to date. The author has dated this study January 1, 1939, yet since that date there have been innumerable changes of importance, both in law and in law interpretation. For example, the Pennsylvania legislation of 1937, effective in January of 1938, was repealed in 1939 and the entire Pennsylvania Compensation Act was rewritten effective July 1, 1939. Moreover, the Pennsylvania provision for second injury and rehabilitation (Act 323, June 4, 1937, P.L. 1552) was declared unconstitutional by the Pennsylvania Supreme Court April 15, 1939, on the ground that by legislation it exacted sums from one person for the benefit of others. Again, the Delaware Act became extraterritorial by Act of Legislature April 12, 1939. A description of benefits and compensation laws is far better treated by the loose-leaf method, since that is the only possible way in which it can be kept up to date.

It is rather difficult to determine precisely the type of reader for whom this book was written: it is far too detailed for any but ad-

vanced students and yet it is too elementary to appeal to this class of readers. On the other hand, one very good service which *Workmen's Compensation Insurance* performs is to focus attention on the complexity of the subject to-day as compared with its relative simplicity 25 years ago. It is well at this time to have the limelight thrown on compensation and compensation insurance, and Mr. Hobbs has done his part.

GREGORY C. KELLY

NOTE: The comments on Chapter XIV, The Annual Statement, have been contributed by George B. Elliott, Compensation Actuary of the Insurance Department of Pennsylvania.

Company Pension Plans and the Social Security Act. Studies in Personnel Policy. No. 16. National Industrial Conference Board, New York City, 1939. Pamphlet, pp. 48.

Miss Brower, of the Board's Management Research Division, presents in this pamphlet a very complete summary of private retirement plans in the United States as of the end of last year. The primary purpose of the study is to ascertain the effect of the Social Security Act on these plans but for the average reader the study will probably be valuable principally for the cross-section picture.

The study is based on analysis of the going plans of 220 companies employing a million and a quarter persons. (Information was received from 275 companies; 55 have ceased operation.) There is no way of telling how great a proportion this is of all American formal plans: an analysis of firms by number of workers suggests strongly that the sample is heavily weighted by large and prosperous firms. Of the 220 plans, 169 or over three-quarters are underwritten by insurance companies and financed by employer and employee contributions; the remainder are classified as employer-administered schemes, all but one financed entirely by the employer and apparently all of the unfunded variety. So-called informal pension plans, in which the worker gets a pension when and as the employer wills it, are entirely excluded from the survey. Miss Brower's judgment is that "the most significant trend revealed in the present study is the shift from a non-funded, noncontributory, company-administered pension plan to a group-annuity plan, supported by joint contributions of employer and employee." Changing concepts of employer responsibility have

contributed to this shift but the efforts of insurance salesmen at least as much.

The effect of the Social Security Act (the report was prepared before the full effect of the 1939 amendments could be assessed) on company pension plans has been twofold. It has produced a large net increase (one-quarter of the 220 plans have been adopted since August 1935; only one-tenth of the 275 plans have been dropped) in retirement plans. Because the money-purchase retirement benefit can be made to supplement the compulsory federal system more easily the Act has developed a trend away from the definite-benefit. Over a third of the plans active to-day have been adopted since August, 1935.

Appendices A and B exhibit the principal provisions of selected retirement schemes.

C. A. KULP

Corporate Suretyship. G. W. Crist, Jr. McGraw-Hill Book Company, New York, 1939. Pp. 439.

This is one of a series of insurance treatises produced by the same publishers. According to the preface the book is intended for newcomers and for others who require a broad survey rather than a highly technical treatise. It is the outgrowth of lectures given before insurance students. The material is well organized, the explanations are direct and simple and the chapters and paragraphs contain numerous introductory headings to serve the reader. There is also an ample index for ready reference.

The scope of the book may be readily observed from a review of the chapter headings which are fairly descriptive of the contents:

Chapter	Heading	Page
I	Development of Suretyship	1
II	The Parties to the Bond	24
III	Organization and Supervision of Surety Companies	52
IV	Production	84
V	Losses	106
VI	Reinsurance and Cosuretyship	140
VII	Accounting and Statistics	165
VIII	Rates	190
IX	Fidelity Bond Covers	213
X	Fidelity Bond Underwriting	246
XI	Fidelity Bond Claims	271
XII	Blanket Bonds for Financial Institutions	296
XIII	Bankers' Blanket Bonds	332
XIV	Fiduciary Bonds	360
XV	Conclusions	387

There are also 8 appendixes showing a specimen surety bond, forms of various agreements, applications, card block and label and employer's fidelity statement.

In the development of suretyship the author presents an interpretive history rather than a chronological record of outstanding events. He has constantly in mind the purpose of suretyship, its constantly expanding field in our industrial organization and the service it renders in our economic and social system. The enthusiasm of the author for his subject is evident in every chapter. Apparently he takes advantage of every opportunity to change the condition which prompted his criticism (page 399) that the surety business has failed sufficiently to publicize the value of its service.

At the outset and throughout the text the author makes a particular effort to impress the reader that suretyship is not insurance. He states and restates the differences rather cogently. However, the reader cannot fail to observe throughout the text the constant usage of terms of long standing in the business which imply insurance affiliations.

This book presents primarily the viewpoint of the underwriter and the producer but on account of its broad treatment is valuable to the general reader, the accountant, the statistician and the actuary. From a purely actuarial viewpoint there still is a demand for a more detailed discussion of the underlying hazards and their relationship to various premium bases.

PAUL DORWEILER

Progress of State Insurance Funds under Workmen's Compensation. John B. Andrews. Bulletin No. 30, U. S. Department of Labor, Division of Labor Standards. 1939. Pamphlet, pp. viii, 42.

In addition to presenting his case for state insurance, the author includes in this pamphlet a critical discussion of the faults of private company administration of workmen's compensation insurance.

The premium growth of state funds in the United States from 1933 to 1937 was 151 per cent as compared with 126 per cent for private companies. In premium volume the state fund 5-year increase was $54,000,000 as compared with $150,000,000 for private carriers.

Superiority of state funds over private casualty companies is claimed on grounds of economy, security, social service and public responsibility. Claims for economy are based principally on a comparison with stock casualty companies rather than with the lower net cost of mutual casualty companies. In these comparisons the state fund costs are not loaded for expenses borne by legislative appropriations although the author does mention in a footnote the amounts appropriated for the Ohio fund. A state fund manager is quoted to explain why more employers do not insure with state funds despite lower costs. The reasons given relate to nepotism and reciprocity in private business contacts.

Private insurance carriers are criticized for their practice of selecting risks and refusing to insure hazardous risks but the author does mention the subsequent solution of the problem by voluntary and compulsory rejected-risk plans. The statement is made that under exclusive state insurance greater benefits would be available to employees for premiums no greater than are paid to private carriers. However, it does not follow that the existence of an exclusive state fund would result automatically in higher benefits. New York, with a competitive state fund, and Wisconsin, with private insurance, both have laws which provide higher benefits than are available under the monopolistic law in Ohio.

The author discusses some of the weaknesses of state insurance. He points out the inherent hazards of politics in the administration of state funds. He admits that there exists a potential danger in the "political administration" of state funds and that worth-while insurance activities are sometimes curtailed because of inadequate legislative appropriations. He believes that the political problems encountered by state fund administrators are not to be minimized but attributes them to "efforts to make democracy work." But are not many of the faults of private insurance the result of practical efforts to make democracy work in a capitalistic country? Varying degrees of efficiency and effectiveness are admitted and the conclusion is reached that good management reflected by a high degree of competency and stability in the operating personnel is the secret of success in state insurance.

Unfortunately the author has omitted a comprehensive analysis of the most controversial phase of the subject of state insurance: total underwriting expense to the state. Until someone makes a

fair and complete cost analysis of actual underwriting expense (by methods comparable to those of private insurance accounting) to the people of a state, the cost arguments pro and con will continue.

N. E. MASTERSON

PUBLICATIONS RECEIVED

Profit Sharing and Pension Plans. C. M. Winslow and K. R. Clark. Commerce Clearing House, Chicago, 1940. Pp. 204.

Right to the Point. (Fifth edition.) The Rough Notes Company, Indianapolis, 1939. Pp. 146.

Safety Education. 18th Yearbook. American Association of School Administrators, Washington, D. C., 1940. Pp. 500.

Silicosis. Studies and Reports, Series F, No. 17. International Labor Office, Geneva, 1940.

The Social Security Payroll Taxes. Ralph T. Compton. Commerce Clearing House, Inc., Chicago, 1940. Pp. 464.

Social Security Taxation and Records. Calvin E. Favinger and Daniel A. Wilcox. Prentice-Hall, Inc., New York, 1940.

Reviews of the following publications appear in the current numbers of the *Transactions* of the Actuarial Society of America, and the *Review* of the American Institute of Actuaries:

Mathematical Theory of Graduation. Robert Henderson. 2d ed. (Actuarial Studies, No. 4.) New York: Actuarial Society of America, 1938. Pp. 142.

Mathematics for Actuarial Students. H. Freeman. Published for the Institute of Actuaries by the Cambridge University Press, 1939. Part I, pp. 183; Part II, pp. 339.

Premiums for Life Assurances and Annuities. J. H. Gunlake. London: Cambridge University Press, 1939.

The Treatment of Extra Risks. C. F. Wood. London: Cambridge University Press, 1939. Pp. xi + 126 and 71.

Report of the Committee to Study the Need for a New Mortality Table and Related Topics. San Francisco: National Association of Insurance Commissioners, 1939. Pp. 180.

Compulsory Pension Insurance. Lucien Féraud. Actuarial Technique and Financial Organization of Social Insurance. International Labour Office, Studies and Reports, Series M (Social Insurance), No. 17. Geneva, 1940. Pp. 576.

CURRENT NOTES

THOMAS O. CARLSON, CURRENT NOTES EDITOR

AUTOMOBILE

Rate Changes

On March 11, 1940, a revision in commercial car bodily injury and property damage rates was made, resulting in a reduction in a majority of the classifications. A new classification group numbered 5 was set up with rates approximately 15% below the previously lowest-rated group 4. About two-thirds of the cars formerly in group 4 were transferred to this new group, including such classifications as contracting and construction companies, building contractors, department stores, merchants and manufacturers.

Another change effective on the same date was the transfer of funeral cars from the public section to the miscellaneous rules section of the manual. This transfer means that the rate for funeral cars is now based on the private passenger automobile rates, resulting in a reduction in many rating territories.

These two class changes apply nationwide except for a few states where the changes will probably go into effect at the time of their regular annual revisions of rates.

On June 24, 1940, a substantial reduction in all zone rates applicable to Long Haul Truckmen was introduced. A new intermediate class for truckmen operating between 50 and 100 miles was established, with lower rates applicable to this group. On the same date the rates for school buses were reduced, the reduction amounting in many states to as much as 25%.

Broadening of Coverage

A number of important changes in the standard automobile policy were made in May, 1940, by the National Bureau of Casualty and Surety Underwriters and the American Mutual Alliance. The principal changes are the inclusion of drive-other-cars protection, formerly given by endorsement, liberalization of the age limit and of the trailer exclusions, and a new cancellation provision. Cer-

tain exclusions have been eliminated, such as the exclusions of demonstrating and testing, of coverage after title to the automobile has been transferred and of coverage for commercial automobiles carrying more than eight persons while not used in the assured's business.

Automobile Medical Payments Coverage

Increased limits were made available in March, 1940, for the Medical Payments Coverage in the Automobile Liability Manual. In addition to the limits of $250 and $500 in effect up to that time, further limits of $750, $1,000 and $2,000 were made available.

Burglary

Broadening of Coverage

The coverage under the standard Residence Burglary, Robbery, Theft and Larceny policy has been substantially broadened. A number of coverages which heretofore were available only at an additional premium charge have been incorporated in the policy without additional cost.

The personal hold-up coverage has been replaced by a theft-outside-premises coverage which includes many protective features that were not available heretofore.

Rate Changes

On June 17, 1940 reductions were made in the Messenger and Paymaster Robbery and in the Interior Robbery rates for some of the New York City boroughs.

Fidelity and Burglary

A new combination policy was introduced in July known as the Comprehensive Dishonesty, Disappearance and Destruction policy. It provides in the one contract complete coverage for commercial concerns against losses resulting from burglary, embezzlement, forgery, fraud and similar dishonest acts committed either by employees or persons not employed by the assured. In addition, it indemnifies against loss caused by the disappearance or destruction of money and securities.

The policy contains five insuring agreements embracing the following coverages:

1. Loss through dishonesty of employees.
2. Loss of money and securities within premises, including damage to premises and equipment.
3. Loss of money and securities outside premises, and other loss and damage outside premises.
4. Loss of securities from safe deposit boxes.
5. Loss through forgery of outgoing instruments.

The same rates and underwriting rules in general apply to the new policy as to the separate coverages although the combined coverage is slightly broader than that afforded by the total of the separate contracts.

The assured is given the option of taking part or all of the new policy except that the first agreement is mandatory. The policy is continuous as to term, requiring no periodic re-execution.

Miscellaneous Liability

Schedule Policies

An important innovation in the underwriting of miscellaneous liability risks has been made with the introduction by a large number of companies of schedule liability policies, under which the various liability coverages may be written in one contract. There is a single insuring clause, and separate definitions of hazard indicate the different coverages, separate premiums being charged. Any of the coverages may be carried at the assured's option, with a place provided in the declarations to indicate which are purchased.

Three schedule policy forms are available, depending on the essential character of the risk. One form is for those who are primarily manufacturers, one for contractors and the third for risks where the basic hazard involves buildings and other property usually insured under Owners, Landlords and Tenants policies.

Broadening of Coverage

Simultaneously with the introduction of schedule policies, the coverage on various miscellaneous liability policies was broadened. The Owners, Landlords and Tenants coverage has been broadened

to include installation, servicing, removal or demonstration operations except for a few classifications. The Owners, Landlords and Tenants and Manufacturers & Contractors coverages have been broadened to include (a) pick-up and delivery operations, (b) accidents (except accidents due to mis-delivery) which occur after completion or abandonment of operations, and arise out of pick-up or delivery operations, or the existence of tools, uninstalled equipment and abandoned or unused materials, and (c) the operation and existence of vehicles such as hand trucks, push carts and bicycles not rented to others. This last coverage does not apply to certain classifications.

The property damage exclusions relating to boilers or other receptacles under pressure, engines, fly-wheels, turbines, electrical power units and property of employees were eliminated and coverage for these hazards included in the basic rates without additional charge.

For product liability the subject matter of insurance was amended to include completed or abandoned contracting operations not involving the sale of the insured's goods.

Workmen's Compensation

California Rate Hearing

Considerable interest throughout the casualty insurance business was aroused by the rate hearings held in California over the proposal made last November by the manager of the California State Compensation Insurance Fund to reduce the rates by reducing the expense loading from 40.6% to not more than 26.1%.

A decision was handed down in May, 1940 by the California Insurance Commissioner in which he expressed the following conclusions of law:

"1. The Commissioner has no authority to approve rates that are less than adequate for all workmen's compensation insurors.
2. The Commissioner has no authority to consider interest and earnings from investments in the determination of adequacy in workmen's compensation insurance rates.
3. The effect of the proposed changes, and each of them, upon adequacy or inadequacy of rates would be to reduce the rates so that they would not be adequate for all admitted workmen's compensation carriers."

Among other findings of fact in the decision, it is interesting to note the statement by the Commissioner that his staff computed the actual average expense ratio of the non-participating stock companies in 1938 countrywide Schedule W reports and that the actual expense ratio was found to be greater than the expense loading.

Personal Notes

F. Stuart Brown has been advanced to Statistician of the Indemnity Insurance Company of North America.

Stuart F. Conrod has been advanced to Actuary of the Loyal Protective Life Insurance Company of Boston.

Mark Kormes has begun practise as a consulting actuary in New York City.

John M. Laird, a Fellow of the Society, has been honored by election as President of the Actuarial Society of America.

Edward S. Skillings is now connected with the Allstate Insurance Company as Assistant Comptroller.

Hiram O. Van Tuyl has been made Superintendent of the Accounts Department of the London Guarantee & Accident Company.

LEGAL NOTES

BY
SAUL B. ACKERMAN
(OF THE NEW YORK BAR)

ACCIDENT

[Hoosier Cas. Co. *vs.* McDonald, 24 N.E. 2nd 438.]

The insured was covered by accident insurance policy "against loss resulting directly and independently of all other causes from bodily injury. . . ." The policy provided that the company was not liable for any accident caused by bacterial infection (except pyrogenic infections which should occur with and through an accidental cut or wound). The insured had a tooth extracted by a dentist, when upon examination, he found the tooth ulcerated and advised that it be attended to immediately before infection set in. While the doctor was attempting to get a grip on the tooth which was brittle and hard to pull, the tooth broke loose and came out. Subsequently a bone about the size of a pea was removed. A second dentist removed two more pieces of bone from the socket. The latter testified that the pieces of bone showed signs of disease. He diagnosed the ailment as acute cellulitis, "a spread of infection through the soft tissue into the face and the neck." He treated the insured's jaw for several months and at that period of time the operation consisted of incising tubes into the jaw and jaw bone for drainage of pus coming from the opening. The dentist testified that the ailment was pyrogenic infection. The insurance company contended that the disability was not caused by a pyrogenic infection which occurred with and through an accidental cut or wound, but that the infection occurred with and through a cavity made by the extraction of the tooth, and that it was not an accident, as claimed, within the coverage or the policy. In addition, the insurance company contended that the disability was not a result of bodily injury affected "through accidental means," so as to be covered by the policy, but by means "not accidental," but voluntary and intentional extraction of the tooth.

The Court held that based on every inference that could be made, the infection was caused not by the cavity from the tooth which was extracted, but by forces beyond the cavity from the wound caused by entrance of the bone in the jaw. The slivering

of the jaw bone and the entrance of the slivers of bone into the jaw was unusual, unexpected and unforeseen. The act which proceeded the extraction and the pulling of the tooth which proceeded the pyrogenic infection was something unusual, unexpected and unforeseen. Therefore, the insured's injury was affected through accidental means.

Automobile Liability

[Maryland Casualty Co. *vs.* Tighe, 29 Federal Supplement 69.]

The defendant insurance company issued a policy to a fruit and vegetable peddler insuring against bodily injury, liability, and property damage "arising out of ownership, maintenance, or use of automobiles," "including loading and unloading thereof." The insured truck was parked alongside a curb, about ten feet from an inn on the opposite side of the street. The assistant on the truck carried vegetables from the truck into the inn. He was returning to the truck for further produce for the inn when he ran across the sidewalk backwards and collided with the plaintiff. The insurance company contended that the unloading was completed when the goods were physically removed from the truck and that the provisions for delivery were entirely different from unloading; so far as future unloading was concerned, it would not start until some physical act was performed on or about the truck to affect such unloading and mere intent of the mind of the assistant returning to the truck from the inn, crossing the sidewalk and the street for further unloading of goods constituted no act of unloading within the meaning of the policy.

The Court held that the construction of the policy as contended was entirely too narrow. When the accident happened, unloading was in operation, constituting a process including delivery which was not completed until all produce was carried to the inn. The accident occurred while the unloading was being consummated. Therefore, the company was liable.

Automobile Garage Liability

[Neel *vs.* Indemnity Insurance of North America, 6 A. 2nd 722.]

The insured operated an automobile sales company and purchased a garage liability policy. The policy provided that "the

policy be extended to cover liability of the customer, of the named insured while riding in or operating an automobile by name of the insured. . . ." An employee of the automobile sales company took the automobile to the home of a prospective customer for the purpose of examining and testing the car. During the day, the son of the prospective customer, at his father's request, and for the purpose of advising the father as to whether or not the car should be purchased, took the car for a trial run. While the son was driving the car, an accident happened. The father was not in the car. The injured sued the father and the son and obtained judgment against the father. The company denied liability under the policy, contending that the word "operating" was limited to the personal control of the customer.

The Court held that a study of the dictionary definition and legal usage of the word suggests a use of personal control or control by the customer's servant and therefore, an ambiguity existed. The insurance company which carried the insurance of the automobile sales company incorporated within the policy a provision to protect customers. There is no obvious reason why a customer should be satisfied with an indemnification not covering liability for negligence of a son, wife, or even a chauffeur for whose use the automobile was, in part, purchased and upon whose judgment and preference he would be influenced and make his decision. If the term "operating" were limited to the customer, the additional customer's coverage would omit every real element of risk incidental to the general concern against which the insurance should be directed. The company was, therefore, liable.

Contractors' Liability

[Biwabik Concrete Aggregate Co. *vs.* U. S. Fidelity and Guaranty Co., 288 N.W. 394.]

The insurance company agent solicited insurance at the plaintiff's place of business, and gravel pit. The agent saw and knew the nature of the plaintiff's operations, and knew horses were used in connection with the business. The agent was advised by the plaintiff that it desired liability insurance that would furnish complete coverage in its operations. Thereafter a liability policy was issued. The classifications of the operations typed in the policy was "Sand and Gravel digging—no canal, sewer, or cellar

excavation—including Drivers, Chauffeurs, and their Helpers." The policy provided that the company was not responsible for accidents "caused by any draught or driving animal, or vehicle or automobile owned, hired, borrowed, or used by the insured or any person while engaged in maintenance or use of the same."

A horse used by the insured in carrying on the business at the place described in the policy was negligently allowed to escape from custody, came onto the highway, collided with an automobile and injured various people in the automobile. The insurance company refused to defend or settle the claim due to the exclusion and the insured settled the claim.

The Court held that the exclusion considered without reference to the words typed into the policy might well be understood to apply to the accident. However, since an employee was engaged in unharnessing the horse he had been driving, at the time, it seems clear that the clause would by reference to the classification of operations, specifically including "Drivers, Chauffeurs, and their Helpers" bring the accident within the accident protection afforded by the policy. The conflict cannot be reconciled because "Drivers, Chauffeurs and their Helpers" must necessarily use or maintain animals, vehicles, automobiles owned, hired, borrowed or used by the insured. One of the provisions must be ignored. The one to be ignored is governed by the ruling that the provision inscribed in the policy form must be accepted in case of conflict with the provision including the intent of the parties. The exclusion set out is part of the policy form but that part of the policy which specifically refers to "Drivers, Chauffeurs, and their Helpers" was typed into the policy. The latter has precedence over the former. The accident, therefore, was covered by the policy.

In addition, the agent knew the nature of the insured's operations. Facts made it quite clear that the parties to the contract intended to cover accidents such as the one in question.

Contractors' Liability

[Hutchinson Gas Co. *vs.* Phoenix Indemnity Co. et al., 288 N.W. 847.]

The plaintiff, a gas company, had a liability policy and the description of work covered was "gas works—including hazards of

gas explosions, inhalation, and asphyxiation—all operations—including maintenance, salesmen, outside, collectors, and meter readers. . . ." The policy provided that the company was not liable for accidents which occurred after final completion of the work performed by the insured at the place of occurrence of such accidents, nor for the consumption, use or handling by persons not in the employ of the insured while somewhere other than in or on premises occupied or used by the insured for the prosecution of the work described in and covered by the policy or anything obtained from the insured.

A brooder house fourteen feet long, eight feet wide, and seven and one-half feet high was installed on a truck in which five persons intended to camp while on a hunting expedition. The gas company installed two gas plates to be used for cooking and one "Radiantfire" heater, operated by propane gas which the occupants of the truck took along in a bottle or tank containers. One container was connected to the stove by a copper tube. The men reached their destination and spent the night in the brooder house. The following morning, two game wardens found four of them dead. Suit was brought against the gas company on the theory that the gas company was negligent in installing supplies to carry off the carbon dioxide which resulted from the combustion which took place in the fixtures it installed. The insurance company denied liability. The gas company contended that the description of operations of the policy modified the paragraph relating to the exclusions and that this construction gave full coverage of such accidents. In fact, the gas company contended that it was covered for all public liability while operating a gas works.

The Court held that the broadest possible construction in favor of the gas company covering all operations must be considered with the fact that the policy relates only to the work during prosecution and ceases at its completion. Although there is reference to certain employees in the description of the work covered, this was done in order to include the wages of these employees as a basis for the rates charged for a premium. The insurance company was, therefore, not bound under the policy to defend the gas company in the suits.

Fidelity Bond

[City Trust and Savings Bank of Kankakee, Illinois *vs.* Underwriting Members of Lloyds of London, England, 109 Federal 2nd 110.]

The plaintiff bank had a fidelity bond in the sum of $25,000 covering the period February 28, 1936 to February 28, 1937. During the period covered by the policy, the bank's teller stole $15,014.57. Prior to February 28, 1936, he had stolen other moneys from the plaintiff in the sum of $37,667.70 which was partly covered by a similar policy for $25,000 issued by another company, which policy expired March 15, 1936. The plaintiff received the full amount of the policy, but lacked $12,667.70 of paying the loss sustained by the plaintiff for the former period. Of the $15,014.57 stolen during the period covered by the present policy, $3,600 was stolen by the teller in December, 1936, and placed by him in a safety deposit box. January 28, 1937, the bank discovered the theft and at that time learned of the existence of the $3,600 in the safety deposit box and demanded the return of the money. The box was opened by the teller in the presence of the bank's officers, and the $3,600 turned over to the bank and used towards the reduction of the loss of money due to the teller's thefts prior to the period covered by the present policy. Thereafter, the bank demanded the total amount stolen by the teller. The insurance company paid the bank $11,414.50 of the $15,014.57 and refused to pay the $3,600. The bank contended that the amount due from the insurance could not be reduced by the amount recovered from the safety deposit box before demand was made to the insurance company.

The Court held that the contention of the bank was not tenable. When the $3,600 was returned to the bank by the teller, both loss and liability to this extent was cancelled. The bank contended that it was entitled to retain the $3,600 until fully reimbursed, reimbursed meaning fully reimbursed for the loss and liability during the time prior to the period covered by the bond. The Court held that the clause in the bond referring to the reimbursement was for the losses sustained during the period of the bond.

[U. S. Guarantee Co. *vs.* Elkins et al., 106 Federal 2nd 136.]

A maid in the employ of one Priscilla E. Ferris stole from her mistress a certificate for 100 shares of stock registered in Mrs. Ferris' name. She forged an endorsement and representing herself as Mrs. Ferris, caused the certificate to be sold by the insured who were brokers and who guaranteed the forged signature. A check for the proceeds was drawn to Mrs. Ferris and delivered to the maid who again forged an endorsement on the check and opened an account at the bank. The money was withdrawn and spent. The insured had two indemnity bonds, one with the defendant company known as a "Depositor's Forgery Bond" and another with an indemnity company known as a "Securities Bond." The indemnity company that issued the securities bond paid the loss and took an assignment of its rights under the forgery bond and brought suit to recover the loss, contending that the loss was due to the forgery and was covered by the forgery bond. The forgery bond indemnified "against any losses . . . sustained through the payment . . . of any check . . . drawn by . . . the insured . . . upon which signature of any indorser thereof shall have been forged. . . ." The securities bond insured against "direct losses sustained by insured by reason of having . . . sold as broker or agent for any other securities . . . which shall have been sold under forged . . . endorsements."

The Court held that when the broker sold the stock at that time there was no loss; the stock had dropped and could have been repurchased out of the proceeds and returned without loss. However, when the check was deposited and drawn on, the proceeds were dissipated, and the loss occurred. The immediate cause of the loss was the forged check, specifically covered by the forgery bond.

Payroll Robbery

[Guarisco *vs.* Massachusetts Bond and Insurance Co., 16 N. Y. Supp., 2nd 208.]

The insured purchased a payroll policy. A hold-up occurred at which time the money was in possession of a guard accompanying the custodian. The company denied liability as the money was not in possession of the custodian at the time of the loss.

The Court held that the policy provided that the custodian of the money must be actually in possession of the money and property insured. Although there was a hold-up, since the money was on the person of the guard accompanying the custodian at the time of the robbery, the company was not responsible.

Safe Burglary

[Bridge et al. *vs.* Massachusetts Bond and Insurance Co., 23 N.E. 2nd 367.]

The insured who owned a retail jewelry store purchased a safe burglary policy covering three safes designated as safes numbers one, two and three. In addition, he purchased an office robbery policy. One day the manager of the store opened the store and proceeded to go to the rear of the store for the purpose of turning on the lights. He suddenly heard someone enter the store whom he greeted with a "Good morning." Receiving no answer he turned and discovered someone walking rapidly toward him. He hurried toward the switchbox to turn on the lights, but as he opened the door he was commanded, "Don't turn on the buzzer." The assailant commanded the manager to get busy and open the safes or "I'll kill you." The manager who was near safe number two did not open the safe soon enough and the assailant struck him across the head, cutting the scalp and causing it to bleed profusely. Blood on the manager's hand was smeared across the combination of the safe. The assailant hit the manager across the head a second time, causing his gun to discharge and the bullet struck the safe. He called for his confederate who had been watching in front of the store. Blood obliterated the dial and the manager could not manipulate the lock. The manager was then forced to go to safe number one in the store and open it. While so opening the safe, blood was left on three sets of doors. The robbers extracted the money and merchandise from the safe and also took the jewelry. The total amount covered by the robbery policy was $2,500; and the burglary policy covered for $9,000. The loss due to the robbery was $8,565.98. The insured claimed liability under both policies. The company admitted the robbery and made settlement under the robbery policy. The insured contended that the marks of the bullet on the safe number two were evidences of force and violence and that the blood of the employee of the in-

sured was evidence of the use of chemicals as provided in the safe burglary insurance policy.

The Court held that the bullet mark on safe number two was not proof of marks of tools, explosives or chemicals on the door of safe number one, nor were the blood stains from the fingers of the insured's employee any proof that such entry was made by "actual force and violence of which there shall be visible marks made by tools, explosives, electricity, gas, or other chemicals" upon the door of the safe into which felonious entry was made. The policy did not comprehend chemicals such as blood which is generated through the organic mechanisms of the human body to be included within the terms tools, explosives, electricity, gas or other chemicals used by burglars.

Workmen's Compensation

[Stewart *vs.* Mullineaux, 10 A. 2nd 122.]

A workmen's compensation policy was issued to the defendant employer. Subsequently, the agent and the insurance company concluded that he was quitting business due to labor difficulties. In addition, a cargo policy had been issued to him. The agent requested him to bring the two policies to his office, but said nothing about the cancellation. The employer delivered the cargo policy to the agent and stated he could not locate the workmen's compensation policy. The agent told the employer to sign a "lost policy receipt." The employer was not told and did not know or understand that the policy was to be cancelled. The agent testified that he took for granted that the employer understood that he was releasing his workmen's compensation policy. The form which was presented to the employer and which he signed was endorsed with the following note: "Cancel pro rata at request of company as of 8-4-37." The agent sent no notice to the employer of the alleged cancellation. After twenty days, the insurance company informed the state rating and inspection bureau that the policy had been cancelled. Subsequently, an employee of the defendant employer was killed and an action was brought against the employer and the insurance company. The company contended that a notice of the cancellation of the policy was not necessary.

The Court held that the cancellation of the policy was not effective, and the company by not giving the required notice of cancellation warranted the compensation authorities in concluding that the attempted cancellation was ineffective. The conditions of the cancellation must be strictly complied with and if notice is required, it must be given.

Furthermore, the employer did not understand and was not told that the policy would be cancelled. The agent acknowledged that he had not told him so, but said that he took for granted that the employer understood that the paper was a release and cancellation of the policy.

OBITUARY

LEON S. SENIOR

1873-1940

Leon S. Senior was born in Kovno, Russia, on July 12, 1873. His father was principal of a business school. The boy Leon was an excellent student and soon outstripped the members of his class. When only eleven years of age he won a scholarship to the Gymnasium at Dunaburg which was an exclusive school generally reserved for the sons of the rich. During his lifetime he mastered five languages.

The family emigrated to America in 1888 because the father was convinced that there were more opportunities for his children in the New World. They settled in New York City where Leon worked during the day as a bookkeeper and attended Cooper Union Institute at night. Later he entered New York University and graduated at the early age of twenty. Because of his youth he had to wait a year before he was allowed to take the examinations for admission to the New York Bar.

Mr. Senior joined the New York Insurance Department as an examiner of casualty companies in 1909. His work soon attracted attention and led to important reforms in the field of industrial accident and health insurance. Thereafter he made special studies of workmen's compensation and assisted in drafting the early legislation on the subject introduced in New York State in 1913. The following year he became head of the Bureau of Workmen's Compensation in the Insurance Department but shortly thereafter resigned to accept the post of General Manager of the Compensation Insurance Rating Board which was organized on May 15, 1914. He held this until the time of his death.

Under his leadership the administration of premium rates for workmen's compensation insurance in the State of New York reached a high degree of efficiency and the procedure which he initiated were adopted by a number of rate-making organizations of other states. Mr. Senior was universally acknowledged as one of the leading experts on compensation rate-making in the country.

He was a charter member of this Society, a frequent contributor

to its *Proceedings*, its President from 1936 to 1938, and served the Society in various other capacities since its inception.

Mr. Senior died suddenly on February 3, 1940. His passing is a great loss not only to the members of this Society, but also to the institution of casualty insurance which he served so faithfully and well.

The above account recites the facts of Mr. Senior's career but this notice would be incomplete if it did not attempt to portray Senior the man, his vigorous character, his active clear-thinking mind, his kindly and helpful disposition—in short his personality that made him so endeared to his colleagues and associates. A lawyer by early training, Mr. Senior, when he found himself confronted, in the field of compensation insurance, with the various actuarial questions involved, rapidly assimilated the fundamentals of actuarial thought and became one of the most outstanding exponents of sound actuarial philosophy. Those who had the privilege of seeing him unravel the tangled threads of many a controversial issue, by tireless efforts of oral and written exposition, by patient bringing together of various conflicting views, by masterly presiding at the council or committee table—always striving, and nearly always successfully, to ascertain the right thing to do and usually securing this by the force of his strong and uncompromising yet conciliatory personality—those who saw this, and they are many, know that the insurance business, the State and the people have lost a good friend and a worthy member. The maintenance of the principles he fought for to establish and preserve will prove his most fitting memorial.

The Casualty Actuarial Society particularly will miss Leon Senior—an untiring supporter and worker for the Society before, during and after his term as President. His written and oral contributions to our *Proceedings* were many and valuable. His encouragement to the younger—and older—members was continuous and effective. His sage counsel was always sought and invariably forthcoming. We have a deep feeling of sadness in losing such a true friend.

OBITUARY

LEWIS A. NICHOLAS

1874-1940

Lewis A. Nicholas, a Charter Member of the Society, died suddenly at his home, 591 Thirty-eighth Street, North Bergen, New Jersey, on Sunday, April 21, 1940.

Born at Suffern, New York, on December 8, 1874, Mr. Nicholas was educated in the local schools there. He early showed outstanding proficiency in mathematics and specialized in that branch throughout his school career in addition to taking outside special courses on the subject. He joined the Fidelity and Casualty Company in 1895, this being his first and only position in the business world. During his entire period of association with the company Mr. Nicholas was engaged in statistical work and since 1921 had been Assistant Secretary and head of the Statistical Division of the company.

In addition to being a Charter Member of this Society he was a Charter Member of the Association of Casualty and Surety Accountants and Statisticians. He was a Director of the Palisades Building and Loan Association of Union City, New Jersey, Treasurer and Vestryman of St. John's P. E. Church and executive member of the staff of Christ Hospital, Jersey City, New Jersey.

Mr. Nicholas' talents and tastes were more along statistical than actuarial lines and formal contributions of his work to our Society were small. Through his friendship, however, and his help and encouragement, particularly to the younger members, he worthily played his part. He was very active in the work of the Association of Casualty and Surety Accountants and Statisticians, being Chairman of its Membership Committee almost since the foundation of the Association. He made valuable contributions to the building up of the present system of casualty statistics, particularly during the early formative stages.

His genial and friendly personality endeared him to those with whom he worked and was brought into contact and many instances of his unobtrusive help to others became known only long afterwards. His friends and colleagues and all who had the pleasure of knowing him will miss him.

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ABSTRACT FROM THE MINUTES OF THE MEETING

MAY 17, 1940

The semi-annual (fifty-fourth regular) meeting of the Casualty Actuarial Society was held at the Hotel Biltmore, New York, on Friday, May 17, 1940.

President Perryman called the meeting to order at 10:30 A. M. (daylight saving time). The roll was called showing the following thirty-four Fellows and seventeen Associates present:

FELLOWS

AULT	GODDARD	MASTERSON
BARBER	GRAHAM, C. M.	MATTHEWS
BLANCHARD	HAUGH	MILLS
BROWN, F. S.	HOBBS	MOORE
CAHILL	JONES, H. M.	OBERHAUS
CLEARY	KARDONSKY	PERRYMAN
COGSWELL	KELLY	PRUITT
COMSTOCK	KORMES	SKELDING
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CORCORAN	LINDER	VALERIUS
FONDILLER	LYONS	VAN TUYL
	MARSHALL	

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BLACK	GUERTIN	MINOR
BUFFLER	HAGEN	POTOFSKY
ELLIOTT	HIPP	SMITH, S. E.
FARLEY	KOLODITZKY	STOKE
FITZ	LASSOW	

By invitation, a number of officials of casualty companies and organizations were present.

Mr. Perryman read his presidential address.

The minutes of the meeting held November 16 and 17, 1939, were approved as printed in the *Proceedings*.

The Secretary-Treasurer (Richard Fondiller) read the report of the Council and upon motion it was adopted by the Society.

The President announced the deaths, since the last meeting of the Society, of Leon S. Senior, ex-president, and Lewis A. Nicholas, Fellow, and the memorial notices appearing in this Number were thereupon read.

The new papers printed in this Number were read.

The papers presented at the last meeting were discussed.

Recess was taken for lunch at the Hotel until 2:15 P. M.

Informal discussion was participated in by a number of members and invited speakers upon the following topic:

"Automobile Rating Plans."

Upon motion, the meeting adjourned at 4:30 P. M.

REPRESENTATIVES OF CASUALTY COMPANIES AND ORGANIZATIONS PRESENT

R. H. Caplan, Jr., Chief Accountant, Fireman's Fund Indemnity Company, New York.

G. W. Crist, Jr., Manager, Metropolitan Department, Fidelity & Deposit Company, New York.

H. E. Curry, Actuary, Farm Bureau Insurance Companies, Columbus, Ohio.

William F. Dowling, Assistant Treasurer, Lumber Mutual Casualty Insurance Company, New York.

Ernest A. Erickson, Statistician, Utilities Mutual Insurance Company, New York.

John G. Goetz, Director, Risk Research Institute, New York.

R. L. Inglis, Vice-President, Associated Indemnity Corporation, New York.

Myrtle S. Kelly, Statistician, Pennsylvania Compensation Rating and Inspection Bureau, Philadelphia, Pa.

John H. Lewis, Statistician, Lumber Mutual Casualty Insurance Company, New York.

John A. McKellar, 27 James Street, Bergenfield, N. J.

Arthur H. Reede, Harvard University, Cambridge, Mass.

C. L. Schlier, Statistician, Compensation Rating and Inspection Bureau of New Jersey, Newark, N. J.

F. B. Schroeter, Zurich General Accident & Liability Insurance Company, New York.

Archibald Seymour, Royal Indemnity Company, New York.

C. G. Van der Feen, Statistician, National Bureau of Casualty and Surety Underwriters, New York.

Paul R. Willemson, Vice-President, Sterling Offices, Ltd., New York.

B. H. Zimels, Statistician, Consolidated Taxpayers Mutual Insurance Company, Brooklyn, N. Y.

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CASUALTY ACTUARIAL SOCIETY

ORGANIZED 1914

1940 YEAR BOOK

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Officers, Council and Committees

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List of Deceased Members

List of Students

Constitution and By-Laws

Examination Requirements

1939 Examination Questions

Papers in the Proceedings

(Addendum to Volume XXVI of the *Proceedings*)

Corrected to February 1, 1940 **No. 19**

FOREWORD

The Casualty Actuarial Society was organized November 7, 1914 as the Casualty Actuarial and Statistical Society of America, with 97 charter members of the grade of Fellow. The present title was adopted on May 14, 1921. The object of the Society is the promotion of actuarial and statistical science as applied to the problems of casualty and social insurance by means of personal intercourse, the presentation and discussion of appropriate papers, the collection of a library and such other means as may be found desirable.

Prior to 1914 little technical study was given to the actuarial and underwriting problems of most of the branches of casualty insurance. The organization of the Society was brought about through the suggestion of Dr. I. M. Rubinow, who became the first president. The problems surrounding workmen's compensation were at that time the most urgent, and consequently many of the members played a leading part in the development of the scientific basis upon which workmen's compensation insurance now rests.

The members of the Society have also presented original papers to the *Proceedings* upon the scientific formulation of standards for the computation of both rates and reserves in accident and health insurance, liability, burglary, and the various automobile coverages. The presidential addresses constitute a valuable record of the current problems facing the casualty insurance business. Other papers in the *Proceedings* deal with acquisition costs, pension funds, legal decisions, investments, claims, reinsurance, accounting, statutory requirements, loss reserves, statistics, and the examination of casualty companies. The Committee on Compensation and Liability Loss Reserves submitted a report which has been printed in *Proceedings* No. 35 and No. 36. The Committee on Remarriage Table submitted a report including tables, printed in *Proceedings* No. 40. The Special Committee on Bases of Exposure work submitted a report which is printed in *Proceedings* No. 43. The "Recommendations for Study" appear in the same number.

The lower grade of membership in the Society is that of Associate, to which all persons must qualify before being allowed to take the examinations for the upper grade of Fellow. Examinations have been held every year since organization; they are held on the third Wednesday and following Thursday in May, in various cities in the United States and Canada. The membership of the Society consists of actuaries, statisticians, and executives who are connected with the principal casualty companies and organizations in the United States and Canada. The Society has a total membership of 308, consisting of 180 Fellows and 128 Associates.

The annual meeting of the Society is held in New York in November and the semi-annual meeting is held in May. The twenty-fifth anniversary of the Society was appropriately celebrated in New York on November 16 and 17, 1939.

The Society twice a year issues a publication entitled the *Proceedings* which contains original papers presented at the meetings. The *Proceedings* also contain discussions of papers, reviews of books, current notes and legal notes. This Year Book is published annually and "Recommendations for Study" is a pamphlet which outlines the course of study to be followed in connection with the examinations for admission. These two booklets may be obtained free upon application to the Secretary-Treasurer, 90 John Street, New York.

CASUALTY ACTUARIAL SOCIETY

NOVEMBER 16, 1939

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*Terms expire at the annual meeting in November, 1940.
†Terms expire at the annual meeting in November of the year given.
‡Deceased February 3, 1940.

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FELLOWS

Those marked (†) were Charter Members at date of organization, November 7, 1914.

Those marked (*) have been admitted as Fellows upon examination by the Society.

Date Admitted	
*Nov. 21, 1930	AINLEY, JOHN W., The Travelers Insurance Company, 700 Main Street, Hartford, Conn.
*Nov. 13, 1931	AULT, GILBERT E., Actuary, Church Pension Fund and Church Life Insurance Corporation, 20 Exchange Place, New York.
May 23, 1924	BAILEY, WILLIAM B., Economist, The Travelers Insurance Company, 700 Main Street, Hartford, Conn.
*Nov. 20, 1924	BARBER, HARMON T., Assistant Actuary, Casualty Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
*Nov. 18, 1932	BARTER, JOHN L., Secretary, Hartford Accident & Indemnity Co., Hartford, Conn.
*Nov. 13, 1931	BATHO, ELGIN R., Assistant Actuary, Equitable Life Insurance Company of Canada, Waterloo, Ontario, Canada.
†	BENJAMIN, ROLAND, Treasurer, Fidelity & Deposit Company of Maryland and American Bonding Company, Baltimore, Md.
*Nov. 22, 1934	BERKELEY, ERNEST T., Superintendent, Actuarial Department, Employers Liability Assurance Corporation, Boston, Mass.
†	BLACK, S. BRUCE, President, Liberty Mutual Insurance Company, 175 Berkeley Street, Boston, Mass.
Apr. 20, 1917	BLANCHARD, RALPH H., Professor of Insurance, School of Business, Columbia University, New York.
May 24, 1921	BOND, EDWARD J., JR., President, Maryland Casualty Company, Baltimore, Md.
†	BREIBY, WILLIAM, Vice-President, Pacific Mutual Life Insurance Company, Los Angeles, Cal.
*Nov. 18, 1927	BROWN, F. STUART, Asst. Statistician, Indemnity Insurance Co. of North America, 1600 Arch St., Philadelphia, Pa.
Oct. 22, 1915	BROWN, HERBERT D., (Retired), Glenora, Yates County, New York.
†	BUCK, GEORGE B., Consulting Actuary for Pension Funds, 150 Nassau Street, New York.
*Nov. 18, 1932	BURHANS, CHARLES H., Standard Accident Insurance Company, 640 Temple Avenue, Detroit, Mich.

FELLOWS

Date Admitted	
Apr. 20, 1917	BURHOP, WILLIAM H., Executive Vice-President, Employers Mutual Liability Insurance Company, Wausau, Wis.
*Nov. 23, 1928	BURLING, WILLIAM H., Assistant Actuary, The Travelers Insurance Company, 700 Main Street, Hartford, Conn.
*Nov. 19, 1929	CAHILL, JAMES M., Actuary, Compensation Insurance Rating Board, 125 Park Avenue, New York.
*Nov. 18, 1932	CAMERON, FREELAND R., Assistant Manager, Automobile Department, American Surety Company, 100 Broadway, New York.
†	CAMMACK, EDMUND E., Vice-President and Actuary, Aetna Life Insurance Company, Hartford, Conn.
*Nov. 17, 1938	CARLETON, JOHN W., State Compensation Insurance Fund, 450 McAllister Street, San Francisco, Calif.
*Nov. 21, 1930	CARLSON, THOMAS O., Assistant Actuary, National Bureau of Casualty & Surety Underwriters, 60 John Street, New York.
†	CARPENTER, RAYMOND V., (Retired), 66 Park Avenue, New York.
*Nov. 13, 1936	CLEARY, ARTHUR E., Actuary, Massachusetts Insurance Department, 100 Nashua Street, Boston, Mass.
*Nov. 15, 1918	COATES, BARRETT N., Coates and Herfurth, Consulting Actuaries, 582 Market Street, San Francisco, Calif.
*Nov. 17, 1922	COATES, CLARENCE S., Assistant Secretary, Lumbermen's Mutual Casualty Company, Mutual Insurance Bldg., Chicago, Ill.
Oct. 27, 1916	COGSWELL, EDMUND S., First Deputy Commissioner of Insurance, 100 Nashua Street, Boston, Mass.
Feb. 19, 1915	COLLINS, HENRY, Manager and Attorney, Ocean Accident & Guarantee Corporation and President, Columbia Casualty Company, 1 Park Avenue, New York.
*Nov. 23, 1928	COMSTOCK, W. PHILLIPS, Statistician, London Guarantee & Accident Company, 55 Fifth Avenue, New York.
*Nov. 22, 1934	CONSTABLE, WILLIAM J., Secretary, Lumbermens Mutual Casualty Company, 342 Madison Avenue, New York.
*Nov. 22, 1934	COOK, EDWIN A., Assistant Secretary, Interboro Mutual Indemnity Insurance Company, 270 Madison Avenue, New York.
†	COPELAND, JOHN A., Consulting Actuary, Candler Building, Atlanta, Ga.
*Nov. 18, 1925	CORCORAN, WILLIAM M., Consulting Actuary, c/o S. H and Lee J. Wolfe, 116 John Street, New York.
†	COWLES, WALTER G., Vice-President, The Travelers Insurance Company, 700 Main Street, Hartford, Conn.
†	CRAIG, JAMES D., (Retired), Ridgewood, New Jersey.
*Nov. 19, 1926	CRANE, HOWARD G., Treasurer, General Reinsurance Corporation, 90 John Street, New York.
*Nov. 18, 1932	DAVIES, E. ALFRED, Budget Supervisor, Liberty Mutual Insurance Company, 125 Berkeley Street, Boston, Mass.
*Nov. 18, 1927	DAVIS, EVELYN M., Woodward, Ryan, Sharp & Davis, Consulting Actuaries, 90 John Street, New York.
†	DAWSON, MILES M., Consulting Actuary and Counsellor at Law, 500 Fifth Avenue, New York.

FELLOWS

Date Admitted	
†	DEARTH, ELMER H., (Retired), 1156 Lincoln Avenue, St. Paul, Minn.
†	DEKAY, ECKFORD C., President, Industrial Service Corporation, 84 William Street, New York.
*Nov. 17, 1920	DORWEILER, PAUL, Actuary, Aetna Casualty & Surety Company, Hartford, Conn.
May 19, 1915	DUNLAP, EARL O., Third Vice President, Metropolitan Life Insurance Company, 1 Madison Avenue, New York.
*Nov. 24, 1933	EDWARDS, JOHN, Casualty Actuary, Ontario Insurance Department, 91 Arundel Avenue, Toronto, Ontario, Canada.
*Nov. 17, 1922	ELSTON, JAMES S., Assistant Actuary, Life Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
*Nov. 15, 1935	EPPINK, WALTER T., Vice-President, Merchants' Mutual Casualty Co., Casualty Insurance Building, Buffalo, New York.
†	FACKLER, EDWARD B., Consulting Actuary, Fackler & Company, 8 West 40th Street, New York.
†	FALLOW, EVERETT S., Actuary, Accident Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
†	FARRER, HENRY, National Security Fire Insurance Company, 99 John Street, New York.
*Nov. 15, 1935	FITZHUGH, GILBERT W., Assistant Actuary, Metropolitan Life Insurance Co., 1 Madison Avenue, New York.
Feb. 19, 1915	FLANIGAN, JAMES E., Agency Manager, Bankers Life Co., 225 Broadway, New York.
†	FLYNN, BENEDICT D., Vice-President and Actuary, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
Feb. 19, 1915	FONDILLER, RICHARD, Woodward and Fondiller, Consulting Actuaries, 90 John Street, New York.
†	FORBES, CHARLES S., Treasurer, Smyth, Sanford and Gerard, Inc., Insurance Brokers, 68 William Street, New York.
*Nov. 22, 1934	FULLER, GARDNER V., Secretary, National Council on Compensation Insurance, 45 East 17th Street, New York.
†	FRANKLIN, CHARLES H., Assistant to the President, Continental Casualty Co., 910 South Michigan Avenue, Chicago, Ill.
*Nov. 18, 1927	FREDRICKSON, CARL H., Actuary, Canadian Underwriters Association, 55 York Street, Toronto, Canada.
Feb. 25, 1916	FROGGATT, JOSEPH, President, Joseph Froggatt & Co., Insurance Accountants, 74 Trinity Place, New York.
†	FURZE, HARRY, (Retired), 42 Douglas Road, Glen Ridge, N. J.
Feb. 19, 1915	GARRISON, FRED S., Secretary, The Travelers Indemnity Co., 700 Main Street, Hartford, Conn.
*Nov. 20, 1924	GINSBURGH, HAROLD J., Assistant Vice-President, American Mutual Liability Insurance Co., 142 Berkeley Street, Boston, Mass.

FELLOWS

Date Admitted	
*Nov. 21, 1930	GLENN, J. BRYAN, Chief Actuary, Railroad Retirement Board, Washington, D. C.
May 19, 1915	GLOVER, JAMES W., (Retired), 620 Oxford Road, Ann Arbor, Mich.
*Nov. 13, 1931	GODDARD, RUSSELL P., American Mutual Liability Insurance Company, 142 Berkeley Street, Boston, Mass.
†	GOODWIN, EDWARD S., 750 Main Street, Hartford, Conn.
*Nov. 19, 1926	GRAHAM, CHARLES M., Associate Actuary, State Insurance Fund, 625 Madison Avenue, New York.
Oct. 22, 1915	GRAHAM, THOMPSON B., Assistant Secretary, Metropolitan Life Insurance Co., 1 Madison Avenue, New York.
†	GRAHAM, WILLIAM J., Vice-President, Equitable Life Assurance Society, 393 Seventh Avenue, New York.
May 25, 1923	GRANVILLE, WILLIAM A., Vice-President, Washington National Insurance Co., 610 Church Street, Evanston, Ill.
†	GREENE, WINFIELD W., Vice-President, General Reinsurance Corporation, 90 John Street, New York.
†	HAMILTON, ROBERT C. L., (Retired) 80 Woodrow Street, Hartford, Conn.
†	HAMMOND, H. PIERSON, Actuary, Life Actuarial Department, The Travelers Insurance Co., 700 Main St., Hartford, Conn.
Oct. 27, 1916	HARDY, EDWARD R., Secretary-Treasurer, Insurance Institute of America, Inc., 80 John Street, New York.
Oct. 22, 1915	HATCH, LEONARD W., (Retired), 425 Pelham Manor Road, Pelham Manor, New York.
*Nov. 19, 1926	HAUGH, CHARLES J., Actuary, National Bureau of Casualty & Surety Underwriters, 60 John Street, New York.
Nov. 17, 1920	HEATH, CHARLES E., Vice-President and Secretary, Standard Surety & Casualty Company of New York, 80 John Street, New York.
Nov. 21, 1919	HENDERSON, ROBERT, (Retired) Crown Point, Essex County, New York.
May 17, 1922	HERON, DAVID, Secretary and Chief Statistician, London Guarantee & Accident Co., Ltd., Phoenix House, King William Street, E.C. 4, London, England.
†	HILLAS, ROBERT J., (Retired) 2 Whippany Road, Morristown, N. J.
May 23, 1924	HOBBS, CLARENCE W., Special Representative of the National Association of Insurance Commissioners, National Council on Compensation Insurance, 45 East 17th Street, New York.
Oct. 22, 1915	HODGKINS, LEMUEL G., Secretary, Massachusetts Protective Association and Massachusetts Protective Life Assurance Co., Worcester, Mass.
†	HOFFMAN, FREDERICK L., Consulting Statistician, 3337 Elliott Street, San Diego, California.

FELLOWS

Date Admitted	
Oct. 22, 1915	HOLLAND, CHARLES H., Bennett & Palmer, 165 Broadway, New York.
*Nov. 22, 1934	HOOKER, RUSSELL O., Actuary, Connecticut Insurance Department, Hartford, Conn.
Nov. 18, 1932	HUEBNER, SOLOMON S., Professor of Insurance, University of Pennsylvania, Philadelphia, Pa.
†	HUGHES, CHARLES, Principal Insurance Report Auditor, New York Insurance Department, 80 Centre Street, New York.
Nov. 19, 1929	HULL, ROBERT S., Unemployment Compensation Division, Social Security Board, Washington, D. C.
†	HUNT, BURRITT A., Assistant Secretary, Aetna Casualty and Surety Co., Hartford, Conn.
†	HUNTER, ARTHUR, Vice-President and Chief Actuary, New York Life Insurance Co., 51 Madison Avenue, New York.
Nov. 18, 1921	HUTCHESON, WILLIAM A., Vice-President and Actuary, Mutual Life Insurance Co., 32 Nassau Street, New York.
Feb. 25, 1916	JACKSON, CHARLES W., Consulting Actuary, Woodward and Fondiller, 90 John Street, New York.
*Nov. 19, 1929	JACKSON, HENRY H., Actuary, National Life Insurance Co., Montpelier, Vt.
May 19, 1915	JOHNSON, WILLIAM C., Vice-President, Massachusetts Protective Association and Massachusetts Protective Life Assurance Co., Worcester, Mass.
Nov. 23, 1928	JONES, F. ROBERTSON, Secretary, Association of Casualty and Surety Executives; and Secretary-Treasurer, Bureau of Personal Accident and Health Underwriters, 60 John Street, New York.
*Nov. 16, 1939	JONES, HAROLD M., Liberty Mutual Insurance Company, 175 Berkeley Street, Boston, Mass.
*Nov. 17, 1938	KARDONSKY, ELSIE, Statistician, Compensation Insurance Rating Board, Pershing Square Bldg., 125 Park Avenue, New York.
Nov. 17, 1938	KELLY, GREGORY C., General Manager, Pennsylvania Compensation Rating & Inspection Bureau, 938 Public Ledger Bldg., Philadelphia, Pa.
*Nov. 19, 1926	KELTON, WILLIAM H., Assistant Actuary, Life Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
†	KING, WALTER I., Ganse-King Estate Service, 1 Federal Street, Boston, Mass.
*Nov. 21, 1919	KIRKPATRICK, A. LOOMIS, Insurance Editor, Chicago Journal of Commerce, 12 East Grand Avenue, Chicago, Ill.
*Nov. 24, 1933	KORMES, MARK, Asst. Director of Training & Organization, New York State Insurance Fund, 625 Madison Avenue, New York.
Nov. 23, 1928	KULP, CLARENCE A., Professor of Insurance, University of Pennsylvania, Logan Hall, 36th Street and Woodland Avenue, Philadelphia, Pa.
Feb. 19, 1915	LAIRD, JOHN M., Vice-President and Secretary, Connecticut General Life Insurance Co., 55 Elm Street, Hartford, Conn.
Nov. 13, 1931	LA MONT, STEWART M., (Retired), 305 Sheldon Avenue, New Rochelle, New York.
*Nov. 24, 1933	LANGE, JOHN R., Chief Actuary, Wisconsin Insurance Department, State House, Madison, Wis.

FELLOWS

Date Admitted	
Nov. 17, 1922	LAWRENCE, ARNETTE R., Special Deputy Commissioner of Banking and Insurance, 1203 Military Park Building, 60 Park Place, Newark, N. J.
†	LEAL, JAMES R., Vice-President and Secretary, Interstate Life and Accident Co., Interstate Building, 540 McCallie Avenue, Chattanooga, Tenn.
†	LESLIE, WILLIAM, General Manager, National Bureau of Casualty & Surety Underwriters, 60 John Street, New York.
*Nov. 20, 1924	LINDER, JOSEPH, Consulting Actuary, c/o S. H. and Lee J. Wolfe, 116 John Street, New York.
Nov. 23, 1928	LUNT, EDWARD C., Vice-President, Great American Indemnity Co., 1 Liberty Street, New York.
*Nov. 13, 1936	LYONS, DANIEL J., Chief Assistant Actuary, New Jersey Department of Banking and Insurance, Trenton, N. J.
†	MAGOUN, WILLIAM N., General Manager, Massachusetts Rating and Inspection Bureau, 89 Broad Street, Boston, Mass.
*Nov. 23, 1928	MARSHALL, RALPH M., Assistant Actuary, National Council on Compensation Insurance, 45 East 17th Street, New York.
*Nov. 18, 1927	MASTERSON, Norton E., Vice-President and Actuary, Hardware Mutual Casualty Co., Stevens Point, Wis.
*Nov. 19, 1926	MATTHEWS, ARTHUR N., The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
May 19, 1915	MAYCRINK, EMMA C., Examiner, New York Insurance Department, 80 Centre Street, New York.
*Nov. 16, 1923	MCCLURG, D. RALPH, Secretary and Treasurer, National Equity Life Insurance Co., Little Rock, Ark.
*Nov. 15, 1935	MCCONNELL, MATTHEW H., JR., Indemnity Insurance Company of North America, 1600 Arch Street, Philadelphia, Pa.
May 23, 1919	MCDOUGALD, ALFRED, Ellerslie, Beddington Gardens, Wallington Surrey, England.
*Oct. 31, 1917	MCMANUS, Robert J., Statistician, Casualty Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
†	MICHELBACHER, GUSTAV F., Vice-President and Secretary, Great American Indemnity Co., 1 Liberty Street, New York.
*Nov. 17, 1938	MILLER, JOHN H., Vice President and Actuary, Monarch Life Insurance Company, Springfield, Mass.
†	MILLIGAN, SAMUEL, Second Vice-President, Metropolitan Life Insurance Co., 1 Madison Avenue, New York.
*Nov. 18, 1937	MILLS, JOHN A., Secretary and Actuary, Lumbermens Mutual Casualty Co., and American Motorists Insurance Co., Mutual Insurance Bldg., Chicago, Ill.
†	MITCHELL, JAMES F., U. S. Manager, General Accident Fire and Life Assurance Corporation, Ltd., 414 Walnut Street, Philadelphia, Pa.
*Nov. 18, 1921	MONTGOMERY, VICTOR, President, Pacific Employers Insurance Co., 1033 So. Hope Street, Los Angeles, Calif.
Nov. 19, 1926	MOONEY, WILLIAM L., (Retired), 4 Pleasant Street, West Hartford, Conn.

FELLOWS

Date Admitted	
†	MOORE, GEORGE D., Comptroller, Standard Surety & Casualty Company of New York, 80 John Street, New York.
†	MOWBRAY, ALBERT H., Consulting Actuary, 806 San Luis Road, Berkeley, Calif.
*Nov. 17, 1920	MUELLER, LOUIS H., President, Associated Insurance Fund, 332 Pine Street, San Francisco, Calif.
†	MULLANEY, FRANK R., Vice-President and Secretary, American Mutual Liability Insurance Co., and Secretary, American Policyholders' Insurance Co., 142 Berkeley Street, Boston, Mass.
May 28, 1920	MURPHY, RAY D., Vice-President and Actuary, Equitable Life Assurance Society, 393 Seventh Avenue, New York.
†	NICHOLAS, LEWIS A., Assistant Secretary, Fidelity & Casualty Co., 80 Maiden Lane, New York.
*Nov. 15, 1935	OBERHAUS, THOMAS M., Office of Woodward and Fondiller, Consulting Actuaries, 90 John Street, New York.
†	OLIFIERS, EDWARD, Actuary and Managing Director, Previdencia do Sul, Caixa Postal 76, Porto Alegre, Brazil.
Nov. 18, 1927	O'NEILL, FRANK J., President, Royal Indemnity Co., and Eagle Indemnity Co., 150 William Street, New York.
†	ORR, ROBERT K., President, Wolverine Insurance Co., Lansing, Mich.
*Nov. 21, 1919	OUTWATER, OLIVE E., Actuary, Benefit Association of Railway Employees, 901 Montrose Avenue, Chicago, Ill.
Nov. 19, 1926	PAGE, BERTRAND A., Vice-President, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
*Nov. 18, 1921	PERKINS, SANFORD B., Secretary, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
Nov. 15, 1918	PERRY, W. T., Deputy Manager, Ocean Accident and Guarantee Corporation, 36 Moorgate, London, E. C. 2, England.
*Nov. 21, 1930	PERRYMAN, FRANCIS S., Secretary and Actuary, Royal Indemnity Co., and Eagle Indemnity Co., 150 William Street, New York.
Nov. 19, 1926	PHILLIPS, JESSE S., Chairman of Board, Great American Indemnity Co., 1 Liberty Street, New York.
*Nov. 24, 1933	PICKETT, SAMUEL C., Assistant Actuary, Connecticut Insurance Department, Hartford, Conn.
*Nov. 17, 1922	PINNEY, SYDNEY D., Associate Actuary, Casualty Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
*Nov. 13, 1931	PRUITT, DUDLEY M., Statistician, Fireman's Fund Indemnity Co., 116 John Street, New York.
May 13, 1927	REID, A. DUNCAN, (Retired), 39 North Mountain Ave., Montclair, New Jersey.
May 23, 1919	RICHARDSON, FREDERICK, Deputy Chairman of the Board, General Accident Fire and Life Assurance Corporation, Perth, Scotland.
*Nov. 19, 1926	RICHTER, OTTO C., American Telephone & Telegraph Co., 195 Broadway, New York.

FELLOWS

Date Admitted	
May 24, 1921	RIEGEL, ROBERT, Professor of Statistics and Insurance, University of Buffalo, Buffalo, New York.
*Nov. 16, 1939	ROBBINS, RAINARD B., Vice President and Secretary, Teachers Insurance and Annuity Association, 522 Fifth Avenue, New York.
*Nov. 16, 1923	ROEBER, WILLIAM F., General Manager, National Council on Compensation Insurance, 45 East 17th Street, New York.
†	SCHEITLIN, EMIL, Treasurer, Globe Indemnity Co., 150 William Street, New York.
†	SENIOR, LEON S., General Manager, Compensation Insurance Rating Board, Pershing Square Bldg., 125 Park Avenue, New York. (Deceased, Feb. 3, 1940)
*Nov. 18, 1937	SHAPIRO, GEORGE I., First Vice President and General Manager, Public Service Mutual Casualty Ins. Corp., 342 Madison Avenue, New York.
*Nov. 13, 1931	SILVERMAN, DAVID, c/o S. H. & Lee J. Wolfe, 116 John Street, New York.
*Nov. 24, 1933	SINNOTT, ROBERT V., Hartford Accident and Indemnity Company, 690 Asylum Avenue, Hartford, Conn.
*Nov. 19, 1929	SKELDING, ALBERT Z., Actuary, National Council on Compensation Insurance, 45 East 17th Street, New York.
*Nov. 19, 1929	SKILLINGS, EDWARD S., c/o S. H. and Lee J. Wolfe, 116 John Street, New York.
*Nov. 18, 1932	SMICK, JACK J., National Council on Compensation Insurance, 45 East 17th Street, New York.
*Nov. 24, 1933	ST. JOHN, JOHN B., Social Security Board, Bureau of Old Age Insurance, Washington, D. C.
Nov. 18, 1927	STONE, EDWARD C., U. S. General Manager and Attorney, Employers' Liability Assurance Corporation, Limited, and President, American Employers' Insurance Company, 110 Milk Street, Boston, Mass.
Feb. 25, 1916	STRONG, WENDELL M., Associate Actuary, Mutual Life Insurance Co., 32 Nassau Street, New York.
Oct. 22, 1915	STRONG, WILLIAM RICHARD, No. 4 "Sheringham," Cotham Road, Kew, Victoria, Australia.
*Nov. 17, 1920	TARBELL, THOMAS F., Actuary, Casualty Actuarial Department. The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
†	THOMPSON, JOHN S., Vice-President and Mathematician, Mutual Benefit Life Insurance Co., 300 Broadway, Newark N. J.
†	TRAIN, JOHN L., President and General Manager, Utica Mutual Insurance Co., 185 Genesee Street, Utica, New York.
Nov. 17, 1922	TRAVERSI, ANTONIO T., Consulting Actuary and Accountant, London Bank Chambers, Martin Place, Sydney, Australia.
*Nov. 23, 1928	VALERIUS, NELS M., Accident & Liability Department, Aetna Life Insurance Co., Hartford, Conn.
*Nov. 21, 1919	VAN TUYL, HIRAM O., Chief Accountant, London Guarantee & Accident Co., 55 Fifth Avenue, New York.

FELLOWS

Date Admitted	
*Nov. 17, 1920	WAITE, ALAN W., Assistant Secretary, Accident and Liability Department, Aetna Life Insurance Co., Hartford, Conn.
*Nov. 15, 1935	WAITE, HARRY V., Statistician, The Travelers Fire Insurance Co., 700 Main Street, Hartford, Conn.
*Nov. 18, 1925	WARREN, LLOYD A. H., Professor of Actuarial Science, University of Manitoba, 64 Niagara Street, Winnipeg, Manitoba, Canada.
†	WHITNEY, ALBERT W., Consulting Director, National Conservation Bureau, Association of Casualty & Surety Executives, 60 John Street, New York.
*Nov. 15, 1935	WILLIAMS, HARRY V., Hartford Accident and Indemnity Co., Hartford, Conn.
*Nov. 13, 1931	WITTICK, HERBERT E., Secretary, Pilot Insurance Co., 199 Bay Street, Toronto, Canada.
†	WOLFE, LEE J., Consulting Actuary, 116 John Street, New York.
May 24, 1921	WOOD, ARTHUR B., President and Managing Director, Sun Life Assurance Company of Canada, Montreal, Canada.
*Nov. 17, 1920	YOUNG, CHARLES N., Engineering and Inspection Division, Eureka Casualty Company, 4007 Chester Avenue, Philadelphia, Pa.

ASSOCIATES

Those marked (*) have been enrolled as Associates upon examination by the Society.

Numerals indicate Fellowship examination parts credited.

Date Enrolled	
May 23, 1924	ACKER, MILTON, Manager, Compensation and Liability Department, National Bureau of Casualty and Surety Underwriters, 60 John Street, New York.
*Nov. 15, 1918	ACKERMAN, SAUL B., Professor of Insurance, New York University, 90 Trinity Place, New York.
*Nov. 16, 1939	AIN, SAMUEL N., Office of George B. Buck, Consulting Actuary for Pension Funds, 150 Nassau Street, New York.
Apr. 5, 1928	ALLEN, AUSTIN F., President and General Manager, Texas Employers Insurance Association and Employers Casualty Co., Dallas, Texas.
Nov. 15, 1918	ANKERS, ROBERT E., Secretary and Treasurer, Continental Life Insurance Co., Investment Building, Washington, D. C.
*Nov. 21, 1930	ARCHIBALD, A. EDWARD, Actuary, Volunteer State Life Insurance Company, Chattanooga, Tenn. (I, II.)
*Nov. 16, 1939	BAILEY, ARTHUR L., Statistician, American Mutual Alliance, 60 E. 42nd Street, New York.
*Nov. 24, 1933	BARRON, JAMES C., General Reinsurance Corporation, 90 John Street, New York. (I, II, IV.)
*Nov. 23, 1928	BATEMAN, ARTHUR E., Liberty Mutual Insurance Company, 175 Berkeley Street, Boston, Mass. (I, II.)
*Nov. 18, 1925	BITTEL, W. HAROLD, Associate Actuary, Woodward, Ryan, Sharp, & Davis, 90 John Street, New York.
Nov. 17, 1920	BLACK, NELLAS C., Statistician, Maryland Casualty Co., Baltimore, Md.
*Nov. 22, 1934	BOMSE, EDWARD L., National Bureau of Casualty & Surety Underwriters, 60 John Street, New York.
*Nov. 23, 1928	BOWER, PERRY S., Great West Life Assurance Company, Winnipeg, Manitoba, Canada.
*Nov. 15, 1935	BRERETON, CLOUDESLEY R., Dominion Department of Insurance, Ottawa, Ontario, Canada.
*Nov. 15, 1918	BRUNNQUELL, HELMUTH G., Assistant Actuary, The Northwestern Mutual Life Insurance Co., Milwaukee, Wis.
*Oct. 22, 1915	BUFFLER, LOUIS, Director, Underwriting Department, State Insurance Fund, 625 Madison Avenue, New York.
*Nov. 20, 1924	BUGBEE, JAMES M., Asst. Manager, Automobile Department, Maryland Casualty Co., Baltimore, Md.
Mar. 31, 1920	BURT, MARGARET A., Office of George B. Buck, Consulting Actuary, 150 Nassau Street, New York.
Nov. 17, 1922	CAVANAUGH, LEO D., President, Federal Life Insurance Co., 168 N. Michigan Avenue, Chicago, Ill.
*Nov. 18, 1927	CHEN, S. T., Actuary, China United Assurance Society, 104 Bubbling Well Road, Shanghai, China.
*Nov. 18, 1927	CONROD, STUART F., Associate Actuary, Loyal Protective Life Insurance Co., 19 Fairfield Street, Boston, Mass.

ASSOCIATES

Date Enrolled	
*Nov. 24, 1933	CRAWFORD, WILLIAM H., Assistant Secretary, Fireman's Insurance Co. of Newark, N. J. & Affiliated Fire & Casualty Co's Western Dept., 844 Rush Street, Chicago, Ill. (I, II.)
*Nov. 18, 1932	CRIMMINS, JOSEPH B., Metropolitan Life Insurance Co., 1 Madison Avenue, New York. (I, II.)
*Nov. 18, 1925	DAVIS, MALVIN E., Associate Actuary, Metropolitan Life Insurance Co., 1 Madison Avenue, New York.
*Nov. 24, 1933	DAVIS, REGINALD S., Assistant Comptroller, State Compensation Insurance Fund, San Francisco, Calif. (I, II.)
May 25, 1923	ECONOMIDY, HARILAUS E., Vice President and Comptroller, United Employees Casualty Co., Southern Underwriters Bldg., Houston, Texas.
June 5, 1925	EGER, FRANK A., Secretary-Comptroller, Insurance Company of North America and Affiliated Companies, 1600 Arch Street, Philadelphia, Pa.
*Nov. 17, 1938	ELLIOTT, GEORGE B., Compensation Actuary, Pennsylvania Insurance Department, 938 Public Ledger Building, Philadelphia, Pa.
*Nov. 18, 1937	FARLEY, JARVIS, Assistant Treasurer and Actuary, Massachusetts Indemnity Co., 632 Beacon Street, Boston, Mass. (I.)
*Nov. 16, 1923	FITZ, L. LEROY, Group Insurance Department, Equitable Life Assurance Society, 393 Seventh Avenue, New York. (I, II.)
*Nov. 18, 1927	FITZGERALD, AMOS H., Assistant Actuary, The Prudential Insurance Company of America, Newark, N. J. (I, II.)
*Nov. 16, 1923	FLEMING, FRANK A., Actuary, American Mutual Alliance, 60 East 42nd Street, New York.
Nov. 20, 1924	FROBERG, JOHN, Manager, California Inspection Rating Bureau, 114 Sansome Street, San Franciso, Calif.
*Nov. 13, 1936	FRUECHTEMEYER, FRED J., Liberty Mutual Insurance Co., 175 Berkeley Street, Boston, Mass. (I, II.)
*Nov. 19, 1929	FURNIVALL, MAURICE L., Assistant Actuary, Accident Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn. (I, II.)
*Nov. 22, 1934	GATELY, JOHN J., General Reinsurance Corporation, 90 John Street, New York. (I, II.)
*Nov. 18, 1932	GETMAN, RICHARD A., Life Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn. (I, II.)
*Nov. 17, 1922	GIBSON, JOSEPH P., JR., President and General Manager, Excess Underwriters, Inc., 90 John Street, New York.
*Nov. 16, 1923	GILDEA, JAMES F., The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
Nov. 19, 1929	GORDON, HAROLD R., Executive Secretary, Health & Accident Underwriters Conference, 176 West Adams Street, Chicago, Ill.
*Nov. 18, 1927	GREEN, WALTER C., Consulting Actuary, 211 West Wacker Drive, Chicago, Ill.
*Nov. 15, 1935	GUERTIN, A. N., Actuary, New Jersey Department of Banking and Insurance, Trenton, N. J. (I, II.)
*Nov. 16, 1939	HAGEN, OLAF E., Metropolitan Life Insurance Company, 1 Madison Avenue, New York.
*Nov. 18, 1921	HAGGARD, ROBERT E., Superintendent, Permanent Disability Rating Department, Industrial Accident Commission, State Building, San Francisco, Calif.

ASSOCIATES

Date Enrolled	
*Nov. 17 1922	HALL, HARTWELL L., Associate Actuary, Connecticut Insurance Department, Hartford, Conn.
*Nov. 13, 1936	HAM, HUGH P., British America Assurance Co., 807 Electric Railway Chambers, Winnipeg, Manitoba, Canada. (I,II.)
Mar. 24, 1932	HARRIS, SCOTT, Vice-President, Joseph Froggatt & Co., 74 Trinity Place, New York.
*Mar. 25, 1924	HART, WARD VAN BUREN, Assistant Actuary, Connecticut General Life Insurance Co., Hartford, Conn. (I, II.)
Nov. 21, 1919	HAYDON, GEORGE F., General Manager, Wisconsin Compensation Rating & Inspection Bureau, 715 N. Van Buren Street, Milwaukee, Wis.
Nov. 17, 1927	HIPP, GRADY H., Actuary, State Insurance Fund, 625 Madison Avenue, New York.
Nov. 19, 1929	JACOBS, CARL N., President, Hardware Mutual Casualty Co., Stevens Point, Wis.
*Nov. 18, 1921	JENSEN, EDWARD S., Asst. Secretary, Occidental Life Insurance Co., Los Angeles, Calif. (III, IV.)
Nov. 21, 1930	JONES, H. LLOYD, Deputy General Attorney, of Phoenix-London Group, Vice-President, Phoenix Indemnity Company, and Deputy United States Manager, London Accident & Guarantee Co., 55 Fifth Avenue, New York.
*Nov. 21, 1919	JONES, LORING D., Assistant Director, State Insurance Fund, 625 Madison Avenue, New York.
*Nov. 17, 1922	KIRK, CARL L., Assistant U. S. Manager, Zurich General Accident & Liability Insurance Co., 135 South LaSalle Street, Chicago, Ill.
*Nov. 15, 1935	KITZROW, E. W., Vice-President, Hardware Mutual Casualty Co., Stevens Point, Wis. (I, II.)
*Nov. 16, 1939	KNOWLES, FREDERICK, Commercial Union Assurance Co., Ltd., 388 St. James Street, West, Montreal, Canada.
*Nov. 18, 1937	KOLODITZKY, MORRIS, State Insurance Fund, 625 Madison Avenue, New York. (I, II.)
*Nov. 18, 1937	LASSOW, WILLIAM, Statistician, Board of Transportation of the City of New York, 250 Hudson Street, New York. (I.)
*Nov. 17, 1938	LIEBLEIN, JULIUS, 953 Faile Street, Bronx, New York.
*Nov. 13, 1931	MACKEEN, HAROLD E., The Travelers Insurance Co., 700 Main Street, Hartford, Conn. (I, II.)
Mar. 24, 1932	MAGRATH, JOSEPH J., Executive Assistant, Chubb & Sons, 90 John Street, New York.
*Nov. 18, 1925	MALMUTH, JACOB, Examiner, New York Insurance Department, 80 Centre Street, New York.
Mar. 24, 1927	MARSH, CHARLES V. R., Comptroller and Assistant Treasurer, Fidelity & Deposit Co. and American Bonding Co., Baltimore, Md.
*Nov. 13, 1936	MAYER, WILLIAM H., JR., Actuarial Department, Metropolitan Life Insurance Co., 1 Madison Avenue, New York.
*Nov. 17, 1922	MCIVER, ROSSWELL A., Actuary, Washington National Insurance Co., 610 Church Street, Evanston, Ill.

ASSOCIATES

Date Enrolled	
*Nov. 17, 1922	MICHENER, SAMUEL M., Assistant Actuary, Columbus Mutual Life Insurance Co., 580 East Broad Street, Columbus, Ohio, (I, II.)
*Nov. 13, 1931	MILLER, HENRY C., Comptroller, State Compensation Insurance Fund, 450 McAllister Street, San Francisco, Calif. (I, II.)
*Nov. 19, 1926	MILNE, JOHN L., Actuary, Presbyterian Ministers' Fund for Life Insurance, 1805 Walnut Street, Philadelphia, Pa.
*Nov. 18, 1937	MINOR, EDUARD H., Actuarial Department, Metropolitan Life Insurance Company, 1 Madison Avenue, New York.
Nov. 17, 1922	MONTGOMERY, JOHN C., Secretary and Assistant Treasurer, Bankers Indemnity Insurance Co., 15 Washington Street, Newark, N. J.
May 25, 1923	MOORE, JOSEPH P., President, North American Accident Insurance Co., 455 Craig Street, W., Montreal, Canada.
*Nov. 21, 1919	MOTHERSILL, ROLLAND V., President, Anchor Casualty Co., Anchor Insurance Building, 758 So. Mississippi River Boulevard, St. Paul, Minn. (III, IV.)
*Nov. 18, 1937	MYERS, ROBERT J., Office of the Actuary, Social Security Board, Washington, D. C.
*Nov. 19, 1929	MULLER, FRITZ, Director, Agrippina Life Insurance Stock Co., Berlin, W. 30 Mackensenstr. 16, Germany.
*Nov. 15, 1935	NELSON, S. TYLER, Utica Mutual Insurance Co., 185 Genesee Street, Utica, New York.
*Oct. 27, 1916	NEWELL, WILLIAM, Secretary, Assigned Risk Pool, 60 John Street, New York. (I, II.)
*Nov. 23, 1928	NEWHALL, KARL, Group Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
*Nov. 18, 1925	NICHOLSON, EARL H., Actuary, Joseph Froggatt & Co., 74 Trinity Place, New York.
May 23, 1919	OTTO, WALTER E., President, Michigan Mutual Liability Co., 163 Madison Avenue, Detroit, Mich.
*Nov. 19, 1926	OVERHOLSER, DONALD M., Office of George B. Buck, Consulting Actuary for Pension Funds, 150 Nassau Street, New York.
Nov. 20, 1924	PENNOCK, RICHARD M., Actuary, Pennsylvania Manufacturer, Association Casualty Insurance Co., Finance Building, Philadelphia, Pa.
Nov. 19, 1929	PHILLIPS, JOHN H., Vice-President and Actuary, Employers' Mutual Liability Insurance Co., Wausau, Wis.
*Nov. 17, 1920	PIKE, MORRIS, Vice-President and Actuary, Union Labor Life Insurance Co., 570 Lexington Avenue, New York.
*Nov. 23, 1928	PIPER, KENNETH B., Actuary, Provident Life and Accident Insurance Co., Chattanooga, Tenn. (I, II.)
*Nov. 18, 1927	POISSANT, WILLIAM A., The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
*Nov. 17, 1922	POORMAN, WILLIAM F., Vice-President and Actuary, Central Life Assurance Society, Fifth and Grand Avenues, Des Moines, Iowa. (I, II.)
*Nov. 13, 1936	POTOFSKY, SYLVIA, State Insurance Fund, 625 Madison Avenue, New York. (I.)

ASSOCIATES

Date Enrolled	
Nov. 17, 1922	POWELL, JOHN M., President, Loyal Protective Insurance Co. and Loyal Life Insurance Co., 19 Deerfield Street, Boston, Mass. (I, II.)
*Nov. 15, 1918	RAYWID, JOSEPH, President, Joseph Raywid & Co., Inc., 92 William Street, New York.
Nov. 19, 1932	RICHARDSON, HARRY F., Secretary-Treasurer, National Council on Compensation Insurance, 45 East 17th Street, New York.
*Nov. 18, 1932	ROBERTS, JAMES A., Life Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn. (I, II.)
*Nov. 18, 1927	SARASON, HARRY M., Assistant Actuary, General American Life Insurance Co., 1501 Locust Street, St. Louis, Mo.
Nov. 16, 1923	SAWYER, ARTHUR, Globe Indemnity Co., 150 William Street, New York.
*Nov. 20, 1930	SEVILLA, EXEQUIEL S., Actuary, National Life Insurance Co., P. O. Box 2856, Manila, Philippine Islands.
*Nov. 20, 1924	SHEPPARD, NORRIS E., Lecturer in Mathematics and Mechanics, University of Toronto, Toronto, Canada. (I, II.)
Nov. 15, 1918	SIBLEY, JOHN L., Assistant Secretary, United States Casualty Co., 60 John Street, New York.
*Nov. 18, 1921	SMITH, ARTHUR G., Assistant General Manager, Compensation Insurance Rating Board, Pershing Square Bldg., 125 Park Avenue, New York.
*Nov. 16, 1939	SMITH, SEYMOUR E., Casualty Actuarial Department, Travelers Insurance Co., Hartford, Conn.
*Nov. 19, 1926	SOMERVILLE, WILLIAM F., Assistant Secretary, St. Paul Mercury Indemnity Co., St. Paul, Minn. (I, II.)
*Nov. 18, 1925	SOMMER, ARMAND, Assistant to Vice-President, Continental Casualty Co., 910 So. Michigan Avenue, Chicago, Ill.
*Nov. 18, 1927	SPEERS, ALEXANDER A., Secretary and Actuary, Michigan Life Insurance Co., Detroit, Mich.
*Nov. 15, 1918	SPENCER, HAROLD S., Aetna Life Insurance Co., Hartford, Conn.
Nov. 20, 1924	STELLWAGEN, HERBERT P., Vice-President, Indemnity Insurance Company of North America, 1600 Arch Street, Philadelphia, Pa.
*Nov. 16, 1939	STELSON, HUGH E., Professor of Mathematics, Kent State University, Kent, Ohio.
*Nov. 16, 1923	STOKE, KENDRICK, Actuary, Michigan Mutual Liability Company, 163 Madison Avenue, Detroit, Mich.
*Nov. 21, 1930	SULLIVAN, WALTER F., Associated Indemnity Corporation, 332 Pine Street, San Francisco, Calif. (I, II.)
Mar. 23, 1921	THOMPSON, ARTHUR E., Chief Statistician, Globe Indemnity Co., 150 William Street, New York.
*Nov. 21, 1919	TRENCH, FREDERICK H., Manager, Underwriting Department, Utica Mutual Insurance Co., 185 Genesee Street, Utica, N. Y. (I, II.)
*Nov. 20, 1924	UHL, M. ELIZABETH, National Bureau of Casualty & Surety Underwriters, 60 John Street, New York. (I, II.)
May 23, 1919	WARREN, CHARLES S., Secretary, Massachusetts Automobile Rating and Accident Prevention Bureau, 89 Broad Street, Boston, Mass.
Nov. 18, 1925	WASHBURN, JAMES H., Actuary, 1501 Gale Lane, Nashville, Tenn.

ASSOCIATES

Date Enrolled	
*Nov. 18, 1932	WEINSTEIN, MAX S., Examiner, New York Insurance Department, 80 Centre Street, New York.
*Nov. 18, 1921	WELCH, EUGENE R., Associated Indemnity Corporation, 332 Pine Street, San Francisco, Calif.
*Nov. 18, 1925	WELLMAN, ALEXANDER C., Vice-President and Actuary, Protective Life Insurance Co., Birmingham, Ala.
*Nov. 21, 1930	WELLS, WALTER I., Supervisor of Applications, Massachusetts Protective Association, Worcester, Mass. (I, II.)
Mar. 21, 1929	WHEELER, CHARLES A., Chief Examiner of Casualty Companies, New York Insurance Department, 80 Centre Street, New York.
*Nov. 18, 1927	WHITBREAD, FRANK G., Assistant Actuary, Great West Life Assurance Co., Winnipeg, Manitoba, Canada.
*Oct. 22, 1915	WILLIAMSON, WILLIAM R., Actuarial Consultant, Social Security Board, Washington, D. C.
*Nov. 16, 1939	WITTLAKE, J. CLARKE, Actuarial Department, Business Men's Assurance Company, Kansas City, Mo.
*Oct. 22, 1915	WOOD, DONALD M., Childs & Wood, General Agents, Royal Indemnity Company, 175 W. Jackson Blvd., Chicago, Ill.
*Nov. 18, 1937	WOOD, DONALD M., JR., Childs & Wood, 175 West Jackson Blvd., Chicago, Ill.
*Nov. 18, 1927	WOOD, MILTON J., Assistant Actuary, Life Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
*Oct. 22, 1915	WOODMAN, CHARLES E., Assistant Manager, Ocean Accident & Guarantee Corporation and Comptroller, Columbia Casualty Co., 1 Park Avenue, New York.
*Nov. 22, 1934	WOODWARD, BARBARA H., Examiner, New York Insurance Department, 80 Centre Street, New York.
*Nov. 18, 1925	WOOLERY, JAMES M., Actuary, North Carolina Insurance Dept., Raleigh, N. C.
*Nov. 17, 1922	YOUNG, FLOYD E., Actuary, Montana Life Insurance Co., Helena, Montana.

SCHEDULE OF MEMBERSHIP, NOVEMBER 16, 1939

	Fellows	Associates	Total
Membership, November 17, 1938.....	179	125	304
Additions:			
By examination.....	2	7	9
	181	132	313
Deductions:			
By death.....	1	1	2
By withdrawal.....	..	2	2
By transfer from Associate to Fellow	..	2	2
Membership, November 16, 1939.....	180	127	307

OFFICERS OF THE SOCIETY

Since Date of Organization

Elected	*President*	*Vice-Presidents*	
1914–1915	*I. M. Rubinow	A. H. Mowbray	B. D. Flynn
1916–1917	J. D. Craig	*J. H. Woodward	*H. E. Ryan
1918	*J. H. Woodward	B. D. Flynn	G. D. Moore
1919	B. D. Flynn	G. D. Moore	W. Leslie
1920	A. H. Mowbray	W. Leslie	*L. S. Senior
1921	A. H. Mowbray	*L. S. Senior	*H. E. Ryan
1922	*H. E. Ryan	G. F. Michelbacher	E. E. Cammack
1923	W. Leslie	G. F. Michelbacher	E. E. Cammack
1924–1925	G. F. Michelbacher	S. B. Perkins	R. H. Blanchard
1926–1927	S. B. Perkins	G. D. Moore	T. F. Tarbell
1928–1929	G. D. Moore	S. D. Pinney	P. Dorweiler
1930–1931	T. F. Tarbell	*R. A. Wheeler	W. W. Greene
1932–1933	P. Dorweiler	W. F. Roeber	L. S. Senior
1934–1935	W. W. Greene	R. H. Blanchard	C. J. Haugh
1936–1937	*L. S. Senior	S. D. Pinney	F. S. Perryman
1938–1939	F. S. Perryman	H. T. Barber	W. J. Constable

Secretary-Treasurer

1914–1917.....*C. E. Scattergood
1918–1939.....R. Fondiller

Editor†	*Librarian*†
1914.....W. W. Greene	1914.....W. W. Greene
1915–1917.....R. Fondiller	1915.....R. Fondiller
1918..... W. W. Greene	1916–1921.....L. I. Dublin
1919–1921....G. F. Michelbacher	1922–1924.....E. R. Hardy
1922–1923.....O. E. Outwater	1925–1937.....W. Breiby
1924–1932.....R. J. McManus	1937–1939.....T. O. Carlson
1933–1939.....C. W. Hobbs	

*Deceased.
†The offices of Editor and Librarian were not separated until 1916.

DECEASED FELLOWS

Date of Death	
Nov. 10, 1939	BRADSHAW, THOMAS, President, North American Life Assurance Company, Toronto, Canada.
Aug. 22, 1937	BROSMITH, WILLIAM, Vice-President and General Counsel, The Travelers Insurance Company and The Travelers Indemnity Company, Hartford, Conn.
June 4, 1934	BUDLONG, WILLIAM A., Superintendent of Claims, Commercial Travelers Mutual Accident Association, Utica, N. Y.
Mar. 30, 1935	BURNS, F. HIGHLAND, Chairman of the Board, Maryland Casualty Co., Baltimore, Md.
Feb. 4, 1920	CASE, GORDON, Office of F. J. Haight, Consulting Actuary, Indianapolis, Ind.
July 23, 1921	CONWAY, CHARLES T., Vice-President, Liberty Mutual Insurance Co., Boston, Mass.
Jan. 20, 1922	CRAIG, JAMES MCINTOSH, Actuary, Metropolitan Life Insurance Co., New York.
Sept. 2, 1921	CRUM, FREDERICK S., Assistant Statistician, Prudential Insurance Co., Newark, N. J.
June 21, 1931	DAWSON, ALFRED BURNETT, Consulting Actuary, New York.
Jan. 18, 1929	DEUTSCHBERGER, SAMUEL, Actuary, New York Insurance Department, New York.
July 9, 1922	DOWNEY, EZEKIEL HINTON, Compensation Actuary, Pennsylvania Insurance Department, Harrisburg, Pa.
Oct. 30, 1924	FACKLER, DAVID PARKS, Consulting Actuary, New York.
July 15, 1938	FELLOWS, CLAUDE W., President, Associated Indemnity Co., San Francisco, Calif.
July 25, 1931	FRANKEL, LEE K., Second Vice-President, Metropolitan Life Insurance Co., New York.
Aug. 22, 1925	GATY, THEODORE E., Vice-President and Secretary, Fidelity & Casualty Co., New York.
April 15, 1937	GRAHAM, GEORGE, Executive Vice-President, Manhattan Life Insurance Company, New York.
Oct. 28, 1936	GOULD, WILLIAM H., Consulting Actuary, New York.
Mar. 18, 1932	HINSDALE, FRANK WEBSTER, Secretary, Workmen's Compensation Board, Vancouver, B. C., Canada.
Jan. 22, 1937	HODGES, CHARLES E., Chairman of the Board, American Mutual Liability Insurance Company, Boston, Mass.
Mar. 10, 1924	HOOKSTADT, CARL, Expert, U. S. Bureau of Labor Statistics, Washington, D. C.
Feb. 11, 1928	KEARNEY, THOMAS P., Manager, State Compensation Insurance Fund, Denver, Col.
Oct. 15, 1918	KIME, VIRGIL MORRISON, Actuary, Casualty Departments, The Travelers Insurance Co., Hartford, Conn.
Aug. 3, 1933	KOPF, EDWIN W., Assistant Statistician, Metropolitan Life Insurance Co., New York.
Dec. 9, 1927	LANDIS, ABB, Consulting Actuary, Nashville, Tenn.
Aug. 11, 1938	LITTLE, JAMES FULTON, Vice-President and Actuary, Prudential Life Insurance Company, Newark, N. J.
Nov. 29, 1933	MEAD, FRANKLIN B., Vice-President, The Lincoln National Life Insurance Co., Fort Wayne, Ind.
Mar. 27, 1931	MELTZER, MARCUS, Statistician, National Bureau of Casualty & Surety Underwriters, New York.
Jan. 18, 1936	MILLER, DAVID W., Garden City, Long Island, New York.

DECEASED FELLOWS—Continued

Date of Death	
June 8, 1937	MOIR, HENRY, Chairman of Finance Committee and Director, United States Life Insurance Company, New York.
Aug. 20, 1915	MONTGOMERY, WILLIAM J., State Actuary, Boston, Mass.
Dec. 19, 1929	MORRIS, EDWARD BONTECOU, Actuary, Life Department, The Travelers Insurance Co., Hartford, Conn.
Oct. 12, 1937	OTIS, STANLEY, Counsellor at Law, Manager, Otis Service, New York.
July 24, 1915	PHELPS, EDWARD B., Editor, The American Underwriter, New York.
July 30, 1921	REITER, CHARLES GRANT, Assistant Actuary, Metropolitan Life Insurance Co., New York.
Mar. 21, 1938	REMINGTON, CHARLES H., Pan American Casualty Company, Miami, Fla.
Sept. 1, 1936	RUBINOW, ISAAC M., Secretary, Independent Order of B'nai B'rith, Cincinnati, Ohio.
Nov. 2, 1930	RYAN, HARWOOD ELDRIDGE, Consulting Actuary, New York.
Feb. 26, 1921	SAXTON, ARTHUR F., Chief Examiner of Casualty Companies, New York Insurance Department, New York.
Feb. 3, 1940	SENIOR, LEON S., General Manager, Compensation Insurance Rating Board, New York.
June 22, 1938	SMITH, CHARLES GORDON, Manager, New York State Fund, New York.
May 9, 1920	STONE, JOHN T., President, Maryland Casualty Co., Baltimore, Md.
July 19, 1934	SULLIVAN, ROBERT J., Vice-President, The Travelers Insurance Co., and The Travelers Indemnity Co., Hartford, Conn.
May 25, 1935	THOMPSON, WALTER H., Kemper Insurance Organization, Chicago, Illinois.
Feb. 25, 1933	TOJA, GUIDO, Director General, Institute Nazionale Delle Assicurazioni, Rome, Italy.
May 8, 1935	WELCH, ARCHIBALD A., President, Phoenix Mutual Life Insurance Co., Hartford, Conn.
Aug. 26, 1932	WHEELER, ROY A., Vice-President and Actuary, Liberty Mutual Insurance Co., Boston, Mass.
Dec. 31, 1927	WOLFE, S. HERBERT, Consulting Actuary, New York.
May 15, 1928	WOODWARD, JOSEPH H., Consulting Actuary, New York.
Oct. 23, 1927	YOUNG, WILLIAM, Actuary, New York Life Insurance Co., New York.

DECEASED ASSOCIATES

Date of Death	
Feb. 10, 1920	BAXTER, DON. A., Deputy Insurance Commissioner, Michigan Insurance Department, Lansing, Mich.
Mar. 8, 1931	HALL, LESLIE LE VANT, Secretary-Treasurer, National Bureau of Casualty & Surety Underwriters, New York.
May 8, 1939	JACKSON, EDWARD T., Statistician, General Accident Fire and Life Assurance Corporation, Philadelphia, Pennsylvania.
Dec. 20, 1920	LUBIN, HARRY, Assistant Actuary, State Industrial Commission, New York.
May. 8, 1937	VOOGT, WALTER G., Treasurer and Director, Associated Indemnity Corporation and Associated Fire and Marine Insurance Company, San Francisco, Cal.
Feb. 23, 1937	WATSON, JAMES J., President and General Manager, Allied Underwriters Corporation, Dallas, Texas.
June 11, 1930	WILKINSON, ALBERT EDWARD, Actuary, Standard Accident Insurance Co., Detroit, Mich.

STUDENTS

This list includes candidates who have passed one or more parts of the Associateship Examinations during the last three years.

Those who are listed as having passed all four parts have not yet been enrolled as Associates of the Society by reason of the terms of examination rule IV which reads:

> "Upon the candidate having passed all four parts, he will be enrolled as an Associate, provided he presents evidence of at least one year of experience in actuarial, accounting or statistical work in casualty insurance offices, or in the teaching of casualty insurance science at a recognized college or university, or other evidence of his knowledge of actuarial, accounting or statistical work as is satisfactory to the Council."

Upon the completion of the requirements of the Council in respect to each of these candidates, they will be enrolled as Associates.

The numerals after each name indicate the parts of Associateship Examinations passed.

AGUELE, ANDREW, 216 Suydam Street, Brooklyn, N. Y. (I).

ALLEN, EDWARD S., National Bureau of Casualty and Surety Underwriters, 60 John Street, New York. (II.)

ANDERSON, PHILIP D., John Hancock Mutual Life Insurance Company, 197 Clarendon Street, Boston, Mass. (I, II, III, IV.)

ARNOLD, KENNETH J., 28 East Raleigh Avenue, West New Brighton, New York. (II.)

ARTHUR, CHARLES R., Manufacturers Life Insurance Co., 100 Bloor Street, E., Toronto, Ontario, Canada. (I, II, III, IV.)

BAILEY, ROBERT C., Sovereign Life Assurance Co., Winnipeg, Manitoba, Canada. (I, II, III, IV.)

BAKER, ROBERT W., Manufacturers Life Insurance Co., 100 Bloor Street, E., Toronto, Ontario, Canada. (I, II, III, IV.)

BARNHART, LYLE H., Illinois Insurance Department, Capitol Bldg., Springfield, Ill. (I, II, IV.)

BART, ROBERT D., (American) Lumbermens Mutual Casualty Company, Mutual Insurance Building, Chicago, Illinois. (II.)

BATHO, BRUCE, Illinois Insurance Department, Capitol Bldg., Springfield, Ill. (I, II, III, IV.)

BLACKHALL, JOHN M., Monarch Life Insurance Company, Springfield, Mass. (I, III, IV.)

BOIG, FLETCHER S., Employers Liability Assurance Corporation, 110 Milk Street, Boston, Mass. (I, II, III.)

BROCK, STANLEY E., Equitable Life Insurance Company of Canada, Waterloo, Ontario, Canada. (I, II, III, IV.)

BUCKMAN, ALFRED L., Occidental Life Insurance Company, 756 S. Spring Street, Los Angeles, Cal. (I, II, III, IV.)

CAMERON, WALTER G., Firemen's Fund Indemnity Company, 401 California Street, San Francisco, Cal. (II.)

CAMPBELL, GEORGE C., Metropolitan Life Insurance Co., One Madison Avenue, New York. (I, II, III, IV.)

CANNON, LESLIE A., Great West Life Assurance Co., Winnipeg, Manitoba, Canada. (I, II, III, IV.)

CHAROUS, A. ARTHUR, Old Age Assistance Service of the Cook County Department of Public Welfare, 7300 University Ave., Chicago, Ill. (III.)

STUDENTS

CHODORCOFF, WILLIAM, Assistant Mathematician, Prudential Insurance Company, Newark, New Jersey. (I, II, III, IV.)

CIVIN, PAUL, Student, University of Buffalo, Buffalo, New York. (I, II, III, IV.)

CLEMENS, JOSEPH L., Student, University of Michigan, 540 Packard Street, Ann Arbor, Mich. (II.)

CODY, DONALD D., Equitable Life Assurance Society, 393 7th Avenue, New York. (I, III, IV.)

COHEN, SYDNEY L., Office of S. H. and Lee J. Wolfe, 116 John Street, New York. (I.)

CONRAD, FLORENCE, National Bureau of Casualty and Surety Underwriters, 60 John Street, New York. (II, III.)

CROUSE, CHARLES W., Actuary, American Casualty Company, Reading, Pa. (I.)

D'ALESSIO, WAGNER, 2240 Broderick Street, San Francisco, Cal. (II.)

DANIELS, ARTHUR C., Office of Fackler & Company, 8 West 40th Street, New York. (I, II, III, IV.)

DAVIS, ELMER W. L., The Columbian National Life Insurance Company, 77 Franklin Street, Boston, Mass. (IV.)

DIORIO, GENE, 41 Chestnut Street, Albany, N. Y. (I.)

DiSALVATORE, PHILIP, 652 S. 18th Street, Newark, N. J. (I, II, III, IV.)

DORFMAN, ROBERT, Office of Woodward and Fondiller, Consulting Actuaries, 90 John Street, New York. (I, II.)

ENGLAND, ARTHUR W., Office of Coates and Herfurth, Consulting Actuaries, 582 Market Street, San Francisco, Calif. (I, II, III, IV.)

FEAY, MAURICE F., Equitable Life Assurance Society, 393 Seventh Avenue, New York. (I, II, III, IV.)

FELDMAN, ISRAEL, Metropolitan Life Insurance Co., Ottawa, Ontario, Canada. (I, II, III, IV.)

FELLERS, WILLIAM W., Student, Kent State University, Lowry Hall, Kent, Ohio. (I, II.)

FINKEL, DANIEL, 610 West 139th Street, New York. (I.)

FOOTE, JEAN VIVIAN, 42 Hochelaga Street, W., Moose Jaw, Sask., Canada. (I, II, III, IV.)

GODDARD, DAVID G., The Travelers Insurance Company, 315 Montgomery Street, San Francisco, Cal. (I, II, III, IV.)

GOULD, WILLIAM, Actuarial Division, Metropolitan Life Insurance Co., One Madison Avenue, New York. (I, II, III, IV.)

GOUSS, HAROLD A., 712 So. 16th Street, Newark, N. J. (III.)

GREENE, FOSTER C., National Bureau of Casualty and Surety Underwriters, 60 John Street, New York. (II.)

GREVILLE, THOMAS N. E., Instructor in Mathematics, University of Michigan, Ann Arbor, Mich. (I, II, III, IV.)

GRODEN, GERALD D., Student, University of Buffalo, Buffalo, N. Y. (I.)

GROSSMAN, ELI, United States Life Insurance Company, 101 Fifth Avenue, New York. (I, II, III, IV.)

HENNINGTON, HOWARD H., Equitable Life Assurance Society, 393 Seventh Avenue, New York. (I, III, IV.)

HENRY, MALCOLM H., Statistician, Office of State Budget Director, Lansing, Mich. (II.)

HETHERINGTON, NORRIS W., 2332 College Avenue, Berkeley, Cal. (II.)

HIBBARD, DONALD L., Group Insurance Department, Equitable Life Assurance Society, 393 Seventh Avenue, New York. (I, II, III, IV.)

STUDENTS

JOFFE, SAMUEL W., 1951 North 32nd Street, Philadelphia, Pa. (I, II, III, IV.)

JOHNSON, ROGER A., JR., Compensation Insurance Rating Board, 125 Park Avenue, New York. (II, III, IV.)

JONES, CHARLES H., Metropolitan Life Insurance Company, One Madison Avenue, New York. (I, II, III, IV.)

KALISH, DANIEL H., Compensation Insurance Rating Board, 125 Park Avenue, New York. (II.)

KEALE, HENRY F., Teachers' Retirement System, 139 Center Street, New York. (I.)

KELLY, ROBERT G., Accountant, Pennsylvania Indemnity Corporation, 1511 Walnut Street, Philadelphia, Pa. (I, II, III.)

KIRKPATRICK, THOMAS H., London Life Insurance Company, London, Ontario, Canada. (I, II, III, IV.)

KLEINBERG, SAMUEL L., 813 Park Avenue, Brooklyn, New York. (I, II, III, IV.)

KNOWLER, LLOYD A., State University of Iowa, 212 Physics Bldg., Iowa City, Iowa. (I, III, IV.)

KWASHA, HERMAN, c/o Marsh & McLennan, 70 Pine Street, New York. (I, II, III, IV.)

LAING, CHARLES B., Prudential Insurance Company, Newark, N. J. (I, II, III, IV.)

LAIRD, W. DARRELL, Actuary, Monarch Life Assurance Company, Winnipeg, Manitoba, Canada. (I, II, III, IV.)

LEARSON, RICHARD J., Associate Actuary, Western & Southern Life Insurance Co., Cincinnati, Ohio. (I, II, III, IV.)

LEHANE, LEO J., Central Life Insurance Co., Chicago, Ill. (I, II, III, IV.)

LENGYEL, BELA A., Rensselaer Polytechnic Institute, Troy, New York. (I, III.)

LESHANE, ALBERT H., Employers Liability Assurance Corporation, 110 Milk Street, Boston, Mass. (II.)

LESLIE, WILLIAM, JR., Student, Princeton University, Princeton, N. J. (II.)

LEWIS, BARNETT, 372 St. John Avenue, Winnipeg, Canada. (I, II, III, IV.)

LEWIS, JOHN H., Lumber Mutual Casualty Insurance Company of New York, 41 East 42nd Street, New York. (II.)

LEWIS, RAYMOND W., 1921 Park Road, Washington, D. C. (I, II, IV.)

LINCOLN, CHARLES G., 51 North Quaker Lane, West Hartford, Conn. (I, II, III.)

LITTLE, ROBERT H., Equitable Life Assurance Society, 393 Seventh Avenue, New York. (I, II, III, IV.)

LIVINGSTON, GILBERT R., National Bureau of Casualty and Surety Underwriters, 60 John Street, New York. (I, II.)

LOADMAN, ARTHUR E., 665 Elgin Avenue, Winnipeg, Manitoba, Canada. (I, II, III, IV.)

LOCKE, HENRY D., Liberty Mutual Insurance Company, 175 Berkeley Street, Boston, Mass. (II.)

LOUIS, P. H., United States Life Insurance Company, 101 Fifth Avenue, New York. (I, II, IV.)

LUFKIN, ROBERT W., Employers Liability Assurance Corporation, 110 Milk Street, Boston, Mass. (I, II, III.)

MARKS, MAXWELL, 243 Ryerson Street, Brooklyn, N. Y. (I, II.)

MARSHALL, EDWIN B., American Mutual Liability Insurance Co., 142 Berkeley Street, Boston, Mass. (II.)

MELLOR, VINCENT, General Reinsurance Corporation, 90 John Street, New York, (II.)

STUDENTS

MIDDLESWART, FRANCIS F., Equitable Life Assurance Society, 393 Seventh Avenue, New York. (III.)

MILES, JAMES R., Joseph Froggatt & Co., Inc., 74 Trinity Place, New York. (I, II, IV.)

MOORE, HAROLD P. H., Great West Life Assurance Co., Winnipeg, Manitoba, Canada. (I, II, III, IV.)

MORRIS, WILLIAM S., Equitable Life Assurance Society, 393 Seventh Avenue, New York. (I, IV.)

MULLANS, G. ROBERT, The Travelers Insurance Company, Hartford, Conn. (I, II, III, IV.)

MUNTERICH, GEORGE C., National Council on Compensation Insurance, 45 East 17th Street, New York. (I, II, III.)

MUTH, A. F., Actuarial Department, London Life Insurance Co., London, Canada. (I, II, III, IV.)

NORDOS, WILBUR R., Actuarial Division, Metropolitan Life Insurance Company, One Madison Avenue, New York. (III.)

OGUS, JACK, 180 Beach 41st Street, Far Rockaway, New York. (II.)

O'KEEFE, RICHARD E., Metropolitan Life Insurance Company, One Madison Avenue, New York. (I, II, III, IV.)

ORLOFF, CONRAD, Marsh & McLennan, Inc., 164 W. Jackson Boulevard, Chicago. Ill. (I, II, III, IV.)

PARRY, ARTHUR F., Equitable Life Assurance Society, 393 Seventh Avenue, New York. (I, II, III, IV.)

PAULL, ALLAN E., Student, University of Manitoba, Winnipeg, Manitoba, Canada. (I, II, III, IV.)

PENNEY, WALTER F., Metropolitan Life Insurance Company, One Madison Avenue, New York. (I, IV.)

PETERS, STEFAN, Compensation Insurance Rating Board, 125 Park Avenue, New York. (I, III, IV.)

PRASOW, ROSE, Actuarial Department, Confederation Life Association, Toronto, Ontario, Canada. (I, II, III, IV.)

RACKOFF, Student, University of Michigan, Ann Arbor, Mich. (I, II, III, IV.)

RINTOUL, JOHN W., Canada Life Assurance Co., Toronto, Ontario, Canada. (I, II, III, IV.)

ROBERTSON, ARTHUR G., Government Insurance Department, Ottawa, Ontario, Canada. (I, II, III, IV.)

ROOD, HENRY F., Lincoln National Life Insurance Company, Fort Wayne, Ind. (I, II, III, IV.)

ROSENBERG, NORMAN, Department of Banking and Insurance, Trenton, N. J. (I, II, III.)

ROSS, SAMUEL M., National Bureau of Casualty and Surety Underwriters, 60 John Street, New York. (I, II.)

SCHWARTZ, MAX J., New York State Insurance Department, State Office Building, Albany, N. Y. (I, II, III.)

SCHWARTZ, RICHARD T., Actuarial Department, New York Life Insurance Co., 51 Madison Avenue, New York. (I, II, III, IV.)

SIEGELTUCH, NORMAN, 2201 Caton Avenue, Brooklyn, N. Y. (I, II, III, IV.)

SILVER, HAROLD J., Office of S. H. and Lee J. Wolfe, 116 John Street, New York. (II, IV.)

STRUBLE, WILLIAM I., Travelers Insurance Company, Hartford, Conn. (I, II, III.)

STUDENTS

SUTHERLAND, HENRY M., Sun Life Assurance Company, Montreal, Canada. (I, II, III, IV.)

TEVLIN, DONALD J., Hartford Accident & Indemnity Company, Hartford, Conn. (I, II.)

THOMPSON, EMERSON W., The Travelers Insurance Company, Hartford, Conn. (I, II, III, IV.)

TILLINGHAST, JOHN P., Union Central Life Insurance Company, Cincinnati, Ohio. (I, II, III, IV.)

TOWNE, ROBERT J., Union Central Life Insurance Company, Cincinnati, Ohio. (I, II, III, IV.)

TRACY, ELEANOR, Cornell University, Ithaca, New York. (I, II.)

TUCK, IRA N., 342 Irving Avenue, South Orange, New Jersey. (I, II, III.)

TURNER, PAUL A., Statistician, Eastman, Dillon & Company, 225 So. 15th Street, Philadelphia, Pa. (IV.)

UHTHOFF, D. R., National Council on Compensation Insurance, 45 East 17th Street, New York. (I, II.)

WALL, DEAN, Actuarial Department, General American Life Insurance Co., St. Louis, Mo. (I, II, III, IV.)

WALRATH, ARTHUR J., 7 Kellogg Street, Windsor, Conn. (II.)

WANNER, FRANKLIN D., Kemper Insurance Organization, 4750 Sheridan Road, Chicago, Ill. (I.)

WARD, ROBERT G., Columbian National Life Insurance Co., Boston, Mass (I, II, III, IV.)

WARTELL, BEN, 2402 65th Street, Brooklyn, New York. (I, II.)

WEINFLASH, BERNARD, State Insurance Fund, 625 Madison Avenue, New York. (I, II.)

WEISS, LILIAN S., State Insurance Fund, 625 Madison Avenue, New York. (II.)

WHITE, AUBREY, 97 Chaplin Crescent, Toronto, Ontario, Canada. (I, II, III, IV.)

WILSON, JOHN F., Manufacturers Life Insurance Co., Toronto, Ontario, Canada. (I, II, III, IV.)

WOLFMAN, MAURICE, Office of Harry S. Tressel, 10 South LaSalle Street, Chicago, Ill. (I, II, III, IV.)

WOOD, ERIC H., Equitable Life Assurance Society, 393 Seventh Avenue, New York. (I, II, III.)

WOODDY, JOHN G., 7313 N. Honore Street, Chicago, Ill. (I, II.)

WRIGHT, WILLIAM W., 1831 Jefferson Place, N. W., Washington, D. C. (II.)

YAGMAN, BERNARD, 130 Wadsworth Avenue, New York. (III.)

YATES, J. ARNOLD, The Travelers Insurance Company, Hartford, Conn. (I, II, III, IV.)

YOUNG, WALTER, Prudential Insurance Company, Newark, New Jersey. (I, II, III, IV.)

ZOCH, RICHMOND T., United States Weather Bureau, Washington, D. C. (I, II, III, IV.)

CONSTITUTION

(As Amended November 23, 1928)

Article I.—*Name.*

This organization shall be called the Casualty Actuarial Society.

Article II.—*Object.*

The object of the Society shall be the promotion of actuarial and statistical science as applied to the problems of casualty and social insurance by means of personal intercourse, the presentation and discussion of appropriate papers, the collection of a library and such other means as may be found desirable.

The Society shall take no partisan attitude, by resolution or otherwise, upon any question relating to casualty or social insurance.

Article III.—*Membership.*

The membership of the Society shall be composed of two classes, Fellows and Associates. Fellows only shall be eligible to office or have the right to vote.

The Fellows of the Society shall be the present members and those who may be duly admitted to Fellowship as hereinafter provided. Any Associate of the Society may apply to the Council for admission to Fellowship. If the application shall be approved by the Council with not more than three negative votes the Associate shall become a Fellow on passing such final examination as the Council may prescribe. Otherwise no one shall be admitted as a Fellow unless recommended by a duly called meeting of the Council with not more than three negative votes followed by a three-fourths ballot of the Fellows present and voting at a meeting of the Society.

Any person may, upon nomination to the Council by two Fellows of the Society and approval by the Council of such nomination with not more than one negative vote, become enrolled as an Associate of the Society, provided that he shall pass such examination as the Council may prescribe. Such examination may be waived in the case of a candidate who for a period of not less than two years has been in responsible charge of the statistical or actuarial department of a casualty insurance organization or has had such other practical experience in casualty or social insurance as in the opinion of the Council renders him qualified for Associateship.

Article IV.—*Officers and Council.*

The officers of the Society shall be a President, two Vice-Presidents, a Secretary-Treasurer, an Editor, and a Librarian. The Council shall be composed of the active officers, nine other Fellows and, during the four years following the expiration of their terms of office, the ex-Presidents and ex-Vice-Presidents. The Council shall fill vacancies occasioned by death or resignation of any officer or other member of the Council, such appointees to serve until the next annual meeting of the Society.

ARTICLE V.—*Election of Officers and Council.*

The President, Vice-Presidents, and the Secretary-Treasurer shall be elected by a majority ballot at the annual meeting for the term of one year and three members of the Council shall, in a similar manner, be annually elected to serve for three years. The President and Vice-Presidents shall not be eligible for the same office for more than two consecutive years nor shall any retiring member of the Council be eligible for re-election at the same meeting.

The Editor and the Librarian shall be elected annually by the Council at the Council meeting preceding the annual meeting of the Society. They shall be subject to confirmation by majority ballot of the Society at the annual meeting.

The terms of the officers shall begin at the close of the meeting at which they are elected except that the retiring Editor shall retain the powers and duties of office so long as may be necessary to complete the then current issue of *Proceedings*.

ARTICLE VI.—*Duties of Officers and Council.*

The duties of the officers shall be such as usually appertain to their respective offices or may be specified in the by-laws. The duties of the Council shall be to pass upon candidates for membership, to decide upon papers offered for reading at the meetings, to supervise the examination of candidates and prescribe fees therefor, to call meetings, and, in general, through the appointment of committees and otherwise, to manage the affairs of the Society.

ARTICLE VII.—*Meetings.*

There shall be an annual meeting of the Society on such date in the month of November as may be fixed by the Council in each year, but other meetings may be called by the Council from time to time and shall be called by the President at any time upon the written request of ten Fellows. At least two weeks' notice of all meetings shall be given by the Secretary.

ARTICLE VIII.—*Quorum.*

Seven members of the Council shall constitute a quorum. Twenty Fellows of the Society shall constitute a quorum.

ARTICLE IX.—*Expulsion or Suspension of Members.*

Except for non-payment of dues no member of the Society shall be expelled or suspended save upon action by the Council with not more than three negative votes followed by a three-fourths ballot of the Fellows present and voting at a meeting of the Society.

ARTICLE X.—*Amendments.*

This constitution may be amended by an affirmative vote of two-thirds of the Fellows present at any meeting held at least one month after notice of such proposed amendment shall have been sent to each Fellow by the Secretary.

BY-LAWS

(As Amended November 13, 1936)

Article I.—*Order of Business.*

At a meeting of the Society the following order of business shall be observed unless the Society votes otherwise for the time being:

1. Calling of the roll.
2. Address or remarks by the President.
3. Minutes of the last meeting.
4. Report by the Council on business transacted by it since the last meeting of the Society.
5. New membership.
6. Reports of officers and committees.
7. Election of officers and Council (at annual meetings only).
8. Unfinished business.
9. New business.
10. Reading of papers.
11. Discussion of papers.

Article II.—*Council Meetings.*

Meetings of the Council shall be called whenever the President or three members of the Council so request, but not without sending notice to each member of the Council seven or more days before the time appointed. Such notice shall state the objects intended to be brought before the meeting, and should other matter be passed upon, any member of the Council shall have the right to re-open the question at the next meeting.

Article III.—*Duties of Officers.*

The President, or, in his absence, one of the Vice-Presidents, shall preside at meetings of the Society and of the Council. At the Society meetings the presiding officer shall vote only in case of a tie, but at the Council meetings he may vote in all cases.

The Secretary-Treasurer shall keep a full and accurate record of the proceedings at the meetings of the Society and of the Council, send out calls for the said meetings, and, with the approval of the President and Council, carry on the correspondence of the Society. Subject to the direction of the Council, he shall have immediate charge of the office and archives of the Society.

The Secretary-Treasurer shall also send out calls for annual dues and acknowledge receipt of same; pay all bills approved by the President for expenditures authorized by the Council of the Society; keep a detailed account of all receipts and expenditures, and present an abstract of the same at the annual meetings, after it has been audited by a committee of the Council.

The Editor shall, under the general supervision of the Council, have charge of all matters connected with editing and printing the Society's publications. The *Proceedings* shall contain only the proceedings of the meetings, original papers or reviews written by members, discussions on said papers and other matter expressly authorized by the Council.

The Librarian shall, under the general supervision of the Council, have charge of the books, pamphlets, manuscripts and other literary or scientific material collected by the Society.

ARTICLE IV.—*Dues.*

The dues shall be ten dollars for Fellows payable upon entrance and at each annual meeting thereafter, except in the case of Fellows not residing in the United States, Canada, or Mexico, who shall pay five dollars at the time stated. The dues shall be five dollars for Associates payable upon entrance and each annual meeting thereafter until five such payments in all shall have been made; beginning with the sixth annual meeting after the admission of an Associate as such the dues of any Associate heretofore or hereafter admitted shall be the same as those of a Fellow. The payment of dues will be waived in the case of Fellows or Associates who have attained the age of seventy years or who, having been members for a period of at least twenty years, shall have attained the age of sixty-five years.

It shall be the duty of the Secretary-Treasurer to notify by mail any Fellow or Associate whose dues may be six months in arrears, and to accompany such notice by a copy of this article. If such Fellow or Associate shall fail to pay his dues within three months from the date of mailing such notice, his name shall be stricken from the rolls, and he shall thereupon cease to be a Fellow or Associate of the Society. He may, however, be reinstated by vote of the Council, and upon payment of arrears of dues.

ARTICLE V.—*Designation by Initials.*

Fellows of the Society are authorized to append to their names the initials F. C. A. S.; and Associates are authorized to append to their names the initials A. C. A. S.

ARTICLE VI.—*Amendments.*

These by-laws may be amended by an affirmative vote of two-thirds of the Fellows present at any meeting held at least one month after notice of the proposed amendment shall have been sent to each Fellow by the Secretary.

EXAMINATION REQUIREMENTS

SYLLABUS OF EXAMINATIONS

Effective 1934 and thereafter

SUBJECTS

ASSOCIATESHIP:

PART I

Section 1. *Advanced algebra*

Section 2. *Compound interest and annuities certain*

PART II

Section 3. *Descriptive and analytical statistics*

Section 4. *Elements of accounting, including double-entry bookkeeping*

PART III

Section 5. *Finite differences*

Section 6. *Differential and integral calculus*

PART IV

Section 7. *Probabilities*

Section 8. *Elements of the theory of life contingencies; life annuities; life assurances*

FELLOWSHIP:

PART I

Section 9. *Policy forms and underwriting practice in casualty insurance*

Section 10. *Investments of insurance companies*

PART II

Section 11. *Insurance law and legislation*

Section 12. *Economics of insurance*

PART III

Section 13. *Calculation of premiums and reserves for casualty (including social) insurance*

Section 14. *Advanced practical problems in casualty (including social) insurance statistics*

PART IV

Section 15. *Advanced problems and practical methods of casualty insurance accounting*

Section 16. *Advanced problems in underwriting, administrative and service elements of casualty (including social) insurance*

To assist students in preparation for the examinations, Recommendations for Study have been prepared. This lists the texts, readings and technical material which must be mastered by the candidates. Textbooks are loaned to registered students by the Society. By "registered students" is meant candidates who have signified their willingness to take the examinations by the payment of their examination fees.

RULES REGARDING EXAMINATIONS FOR ADMISSION TO THE SOCIETY

(As Amended November 14, 1935)

The Council adopted the following rules providing for the examination system of the Society:

1. Examinations will be held on the third Wednesday and following Thursday during the month of May in each year in such cities as will be convenient for three or more candidates.

2. Application for admission to examination should be made on the Society's blank form, which may be obtained from the Secretary-Treasurer. No applications will be considered unless received before the fifteenth day of February preceding the dates of examination. Applications should definitely state for what parts the candidate will appear.

3. The examination fee is $2.00 for each part, with a minimum of $5.00 for each year in which the candidate presents himself; thus for one or two parts, $5.00, for three parts, $6.00, etc. Examination fees are payable to the order of the Society and must be received by the Secretary-Treasurer before the fifteenth day of February preceding the dates of examination.

4. The examination for Associateship consists of four parts. No candidate will be permitted to present himself for any part of the examination unless he has previously passed, or shall concurrently present himself for and submit papers for, all preceding parts. If a candidate takes two or more parts in the same year and passes in one and fails in the other, he will be given credit for the part passed. Upon the candidate having passed all four parts he will be enrolled as an Associate, provided he presents evidence of at least one year of experience in actuarial, accounting or statistical work in casualty insurance offices or in the teaching of casualty insurance science at a recognized college or university, or other evidence of his knowledge of actuarial, accounting or statistical work as is satisfactory to the Council.*

* Candidates who have had no insurance experience, or whose experience is limited exclusively to life insurance companies, or who have not had one year of casualty insurance experience, will not be enrolled as Associates after passing all four Parts, until they have had one year of casualty insurance experience; however, candidates not having one year of casualty insurance experience may, in accordance with a ruling of the Committee on Admissions, be enrolled as Associates upon passing the examination for Fellowship Parts I and II.

EXAMINATION REQUIREMENTS

5. The examination for Fellowship is divided into four parts. No candidate will be permitted to present himself for any part of the examination unless he has previously passed, or is then also presenting himself for all preceding parts. If a candidate takes two or more parts in the same year and passes in one and fails in the others, he will be given credit for the part passed.

6. As an alternative to the passing of Parts III and IV of the Fellowship Examination, a candidate may elect to present an original thesis on an approved subject relating to casualty or social insurance. Such thesis must show evidence of ability for original research and the solution of advanced problems in casualty insurance comparable with that required to pass Parts III and IV of the Fellowship Examination, and shall not consist solely of data of an historical nature. Candidates electing this alternative should communicate with the Secretary-Treasurer and obtain through him approval by the Examination Committee of the subject of the thesis. In communicating with the Secretary-Treasurer, the candidate should state, in addition to the subject of the thesis, the main divisions of the subject and general method of treatment, the approximate number of words and the approximate proportion to be devoted to data of an historical nature. All theses must be in the hands of the Secretary-Treasurer before the third Wednesday in May of the year in which they are to be considered. Where Parts I and II of the Fellowship examination are not taken during the same year, no examination fee will be required in connection with the presentation of a thesis. All theses submitted are, if accepted, to be the property of the Society and may, with the approval of the Council, be printed in the *Proceedings*.

EXAMINATION REQUIREMENTS

Waiver of Examinations for Associate

The examinations for Associate will be waived under Article III of the Constitution only in case of those candidates who meet the following qualifications and requirements:

1. The candidate shall be at least thirty-five years of age.
2. The candidate shall have had at least ten years' experience in casualty actuarial or statistical work or in a phase of casualty insurance which requires a working knowledge of actuarial or statistical procedure or in the teaching of casualty insurance principles in colleges or universities. Experience limited exclusively to the field of accident and health insurance shall not be admissible.
3. For the two years preceding date of application, the candidate shall have been in responsible charge of the actuarial or statistical department of a casualty insurance organization or of an important division of such department or shall have occupied an executive position in connection with the phase of casualty work in which he is engaged, or, if engaged in teaching, shall have attained the status of a professor.
4. The candidate shall have submitted a thesis approved by the Examination Committee. Such thesis must show evidence of original research and knowledge of casualty insurance and shall not consist solely of data of an historical nature. Candidates electing this alternative should communicate with the Secretary-Treasurer and obtain through him approval by the Examination Committee of the subject of the thesis. In communicating with the Secretary-Treasurer, the candidate should state, in addition to the subject of the thesis, the main divisions of the subject and general method of treatment, the approximate number of words and the approximate proportion to be devoted to data of an historical nature.

Library

The Society's library has practically all of the books listed in the Recommendations for Study, as well as others on casualty actuarial matters. Registered students may have access to the library by receiving from the Society's Secretary the necessary credentials. Books may be withdrawn from the library for a period of two weeks upon payment of a small service fee and necessary postage.

The library is in the immediate charge of Miss Mabel B. Swerig, Librarian of the Insurance Society of New York, 100 William Street, New York City.

1939 EXAMINATIONS OF THE SOCIETY

MAY 17 AND 18, 1939

EXAMINATION FOR ENROLLMENT AS ASSOCIATE

PART I

1. (a) Solve the equations

$$a x + b y + c z = 0 \qquad (1)$$
$$a^2 x + b^2 y + c^2 z = 0 \qquad (2)$$
$$x + y + z + (b-c)(c-a)(a-b) = 0. \qquad (3)$$

(b) Solve the equation

$$\sqrt{x^2 - 10x + 41} - \sqrt{x^2 + 10x + 41} = 8.$$

2. (a) Compute the value of $(.98)^6$ correct to four decimal places using the binomial theorem in the development of the answer.

(b) A man spent exactly \$10,000 for cows and horses. Each cow cost \$30 and each horse cost \$40. In how many ways could he have spent the \$10,000 if he bought at least one of each?

3. (a) From four officers and eight privates, in how many ways can a group of six men be chosen to include:

(i) exactly one officer
(ii) at least one officer.

(b) Mr. Brown took an automobile trip, leaving his town at a certain hour and traveling at a uniform rate. An hour later, Mr. Clark started out from the same place and traveled in the same direction at an hourly rate 5 miles per hour greater than that of Mr. Brown. After traveling 100 miles, he overtook Mr. Brown. Find the rate of each man.

4. (a) If the $(n+1)$ numbers $a, b, c, d, \ldots\ldots$ are all different and each of them a prime number, find the different factors of the expression $a^m\, b\, c\, d \ldots\ldots$

   (b) If the sum of an arithmetic progression is the same for p as for q terms show that its sum for $p+q$ terms is 0.

5. (a) State what is meant by the "force of interest" and give formula showing its relation to the effective rate of interest.

   (b) Prove $a_{\overline{n-1}|} = (1+i)\, a_{\overline{n}|} - 1$ and demonstrate the use of this relationship in the construction of annuity tables.

6. (a) Find the purchase price of a \$100 bond with a 6% nominal dividend rate payable quarterly due at par in 5 years to yield 4% nominal convertible quarterly.

   (b) If the bond had been purchased one month later what would the purchase price have been, using the customary approximate method of adding simple interest at the yield rate? Discuss this method and show that the resulting value is always too great.

7. (a) A loan of x is to be discharged by an annuity (made up of principal and interest) of $\frac{x}{10}$ payable at the end of each year, the interest thereon being at i per unit per annum, convertible half yearly. When will the debt be extinguished?

   (b) Show that the value of a perpetuity due payable quarterly is

$$\frac{1}{4\left[1-(1-d)^{\frac{1}{4}}\right]}.$$

8. A mortgage of \$4500 is to be retired by monthly payments of \$40.00 until the debt is extinguished. Find how long it will take to retire the debt, and show amortization table for the payments following the last payment which falls due on an anniversary of the contract. If final payment is not equal to \$40.00 find final payment.

Given rate of interest 5% compounded annually

$$s^{\overline{(12)}}_{\overline{1}|} \text{ at } 5\% = 1.0227$$

$$a_{\overline{12}|} \text{ at } 5\% = 8.8633$$

$$a_{\overline{13}|} \text{ at } 5\% = 9.3936$$

$$1.05^{12} = 1.7958$$

$$1.05^{\frac{1}{12}} = 1.00407.$$

PART II

1. (a) Show that for any frequency distribution the sum of the squares of the deviations from the arithmetic mean is a minimum.

   (b) Define harmonic mean and give example of practical application.

2. (a) Give the purpose and show the derivation of the Charlier check.

   (b) In time series analysis give at least 2 methods of measuring seasonal variation. Explain the details of one of the methods given.

3. An Insurance Company finds that the expense ratios of its 12 Branch Offices arranged by size of premium volume are as indicated below:—

Prem. Volume (in thousands)	Expense Ratios	Prem. Volume (in thousands)	Expense Ratios
250 to 750	44%	1250 to 1750	42%
250 to 750	43%	1250 to 1750	41%
250 to 750	43%	1250 to 1750	41%
750 to 1250	43%	1750 to 2250	40%
750 to 1250	43%	2250 to 2750	41%
750 to 1250	42%		
750 to 1250	41%		

Find the coefficient of regression of these data.

4. (a) Are the two following sets of figures correlated?

x	2	3	4	5	6	7	8
y	1/4	1/9	1/16	1/25	1/36	1/49	1/64

Explain in terms of type of correlation.

(b) Give formula of Irving Fisher's Ideal Index Number and explain its advantage.

5. (a) Characterize the two fundamental books of double entry bookkeeping.

(b) Name two accounts for each of the following account classifications:

(i) Fixed Tangible Assets
(ii) Intangible Assets
(iii) Fixed Liabilities
(iv) Corporation Capital Accounts.

6. (a) Perform the following operations—

(i) Insurance Company A issues a policy through agent John Doe for a premium of $500, on which a commission of 10% is payable. Show entry required to record the transaction on the Company's books.

(ii) Company A reinsures 60% of the policy in part (i) with Company B. Company B agrees to reinsure 60% of Company A's liability for 60% of the premium less a 20% commission for Company A. Show how this transaction would be entered on the books of Companies A and B.

(b) Given Total Assets of $160,000, Total Liabilities of $60,000, prepare three balance sheets exemplifying the handling of the capital accounts for a single proprietorship, a partnership and a corporation (assume 50% surplus).

7 & 8. The trial balance of the X Y Z Casualty Company as of December 31, 1938 is as follows:

Premiums written during 1938		$15,500,000
Losses paid during 1938	$ 8,000,000	
Cash in office and in bank	1,000,000	
Premiums in course of collection	2,200,000	
Reinsurance Premiums Payable		165,000
Reinsurance Premiums Receivable	100,000	
Loss Reserve as of 12/31/38		8,000,000
Capital Stock		5,000,000
Surplus as of 12/31/37		3,800,000
Return Premiums due assured		35,000
Bonds and Stocks	21,000,000	
Reserve for Unearned Premiums as of 12/31/38		7,000,000
Reinsurance in force with other Companies	700,000	
Salaries	2,500,000	
Commissions	2,000,000	
Claim, Inspection & Misc. Expense	250,000	
Rent	1,500,000	
Bureau Assessments	200,000	
Taxes	550,000	
Interest		500,000
	$40,000,000	$40,000,000

From this trial balance prepare a balance sheet and a profit and loss statement, making adjustments for the following:—

Accrued salaries	$60,000
Accrued taxes	50,000
Accrued interest receivable	60,000

Premiums in course of collection shown in trial balance include $200,000 which have been due the company for more than 90 days. (Premiums outstanding over 90 days are not permitted to be treated as assets).

Given:—

(i) Reserve for Unearned Premiums as of 12/31/37	$6,500,000
(ii) Loss Reserve as of 12/31/37	8,500,000

(iii) Calendar Year 1938 Earned Premiums = Unearned Premium Reserve as of 12/31/37 + Written Premiums Calendar Year 1938 — Unearned Premium Reserve as of 12/31/38

(iv) Calendar Year 1938 Incurred Losses = Loss Reserve as of 12/31/38 + Losses Paid during Calendar Year 1938 — Loss Reserve as of 12/31/37.

PART III

1. (a) Define a continuous function.

   (b) Prove $\frac{d}{dx}\log_a v = \log_a e \frac{\frac{dv}{dx}}{v}$.

2. Trace roughly the graph of the curve whose equation is $y^2 = x\,(x^2 - 3x + 2)$ and find the points at which the tangent to the curve is parallel to the coordinate axes.

3. (a) Find
$$\int \frac{dv}{\sqrt{v^2 + a^2}}$$

   (b) Expand e^{-kx} into a power series by Maclaurin's Series (Theorem) and determine for what values of x it is convergent.

4. (a) Find the entire length of the curve $x^{2/3} + y^{2/3} = a^{2/3}$.

   (b) Find the volume generated by revolving its enclosed area about the axis of y.

5. (a) Find $\Delta^{-1}\,[\underline{|x}\,(x^2 + x + 1)]$.

   (b) Express $2x^3 - 3x^2 + 3x - 10$ and its differences in factorial notation.

6. From the following data find the value of u_{47}

$$u_{46} = 19.2884 \qquad u_{49} = 19.6513$$
$$u_{48} = 19.5356 \qquad u_{50} = 19.7620.$$

7. (a) If $u_x = e^x$ and $v_x = x^3$, find the value of $\frac{E\,u_x}{\Delta\,v_x} - \frac{\Delta^2}{E^2}\,u_x$.

   (b) Show that

$$u_0 + nu_1\,x + n_2\,u_2\,x^2 + \cdots\cdots = (1+x)^n\,u_0 + n\,(1+x)^{n-1}\,x\,\Delta\,u_0 + n_2\,(1+x)^{n-2}\,x^2\,\Delta^2\,u_0.$$

8. Sum to n terms the series whose x^{th} term is $2^x\,(x^2 - x)$ by finite integration.

PART IV

1. (a) If four shillings and three half-crowns are placed at random in a line, what is the probability that both the extreme coins will be half-crowns?

   (b) Four persons each draw a card from an ordinary pack of cards (52 cards). What is the chance that no two cards are of equal value?

2. Intuitively we feel that if a coin is tossed "n" times there is a 50:50 chance that a head will present itself an odd number of times. Prove that this is so.

3. (a) The odds against A's solving a certain problem are 4 to 3, and the odds in favor of B's solving the problem are 7 to 5. What is the probability that the problem will be solved if they both try?

   (b) If four whole numbers taken at random are multiplied together, find the probability that the last digit in the product is 1, 3, 7, or 9.

4. A boy in his play is jumping from one ditch bank to the other. In jumping from the upper bank to the lower bank he succeeds 5 times out of 6; in jumping from the lower bank to the upper bank he succeeds 3 times out of 5. What is the chance that after 4 trials he ends on the same side on which he began?

5. (a) Assuming that the deaths in each year are uniformly distributed and supposing that x and y both die in the same year, prove that the chance of x dying before y is exactly $\frac{1}{2}$.

   (b) Show that complete expectation of life equals
   $$\frac{1}{2}\,(q_x + 3\cdot_1|q_x + 5\cdot_2|q_x + \ldots\ldots).$$

6. (a) A contingent annuity may be forborne for a period of years in which case the payments will amount to a certain sum payable to the annuitant, provided he is alive at the end of the period. Show that a contingent annuity of 1 to (x), forborne for n years, amounts to $\frac{N_{x+1} - N_{x+n+1}}{D_{x+n}}$.

   (b) If the probability factor is removed from the expression in example 6 (a), show that it reduces to $s_{\overline{n}|}$.

7. (a) Show that ${}_nV_x = 1 - \frac{a_{x+n}}{a_x}$.

   (b) Explain under what circumstances ${}_nV_x < {}_{n-1}V_{x+1}$ and in what range of ages this anomaly occurs.

8. (a) Give the formula for the determination of the first payment for a whole life insurance on (x) purchased by three payments, the first to be made immediately, the second to be one half the amount of the first and to be made at the end of three years, and the third to be half the amount of the second and to be made at the end of seven years.

   (b) Give formula to find the annual premium payable during the joint lives only for an annuity to the last survivor of (x) and (y) deferred for n years.

EXAMINATION FOR ADMISSION AS FELLOW

PART I

1. (a) What unit serves as a basis for premium computation in connection with the liability insurance of

   (1) Department stores
   (2) Exhibitions in buildings
   (3) Teams
   (4) Manufacturers and Contractors
   (5) Elevator Property Damage
   (6) Products

   (b) Describe the coverage provided by a Residence Burglary Divided Coverage policy.

2. (a) Under an Employer's Non-Ownership Automobile Liability policy

   (a) How many insurable interests may be covered?
   (b) What provision is made with respect to other insurance?
   (c) What is the basis of premium?

   (b) What are the three classes of Long Haul Truckmen described in the Automobile Casualty Manual, and how are rates determined for each class?

3. (a) What are the provisions in the Basic Workmen's Compensation Manual relating to the application of loss and expense constants?

   (b) What coverages as to its employees are available to a maritime concern whose employees are not subject to any Compensation Acts?

4. (a) What coverages would you provide for the employer who wanted complete coverage against loss due to dishonesty? Will this cover loss due to mysterious disappearance where no evidence of dishonesty exists?

   (b) What is the difference between Excess and Deductible Coverage?

5. (a) In what type or types of claims would there be duplication of coverage between a Manufacturers' and Contractors' and an Automobile policy? If there is such duplication and if a Company has both Automobile and Manufacturers' and Contractors' policies in force, what effect would it have on the Limits of Liability? Would your answer be different if the Manufacturers' and Contractors' policy were in one Company and the Automobile in another?

   (b) Compare Plate Glass insurance and Boiler and Machinery insurance. Discuss in particular extent of coverage and basis of premium.

6. Many Casualty companies now have a large proportion of their assets invested in common stocks. In what way is this practice restricted by the New York Law? Discuss the propriety of this practice under present economic conditions.

   Is there a field for investment in real estate mortgages for Casualty companies? In your opinion why are the investments of Casualty companies in real estate mortgages so much less than those of Life companies?

7. Which of the investments enumerated below are available to a Casualty company and what considerations determine the extent of the company's investment in them:

(a) Railroad Bonds	(f) Preferred Stocks
(b) Canadian Government Bonds	(g) Policy Loans
(c) Municipal Bonds	(h) Mortgage Loans
(d) U. S. Government Bonds	(i) Collateral Loans
(e) Common Stocks	(j) Real Estate

8. (a) Discuss the effect of a radical currency inflation on the insurance problem of a manufacturer as respects life, fire, and casualty insurance.
   (b) Compare the distribution of assets of Casualty companies today with that of 1931 or 1932. What types of investment are likely to increase in the near future?

PART II

1. (a) Define insurable interest and explain the reason for the legal requirement that the insured have an insurable interest.
   (b) What is the fundamental distinction between representation and warranty and what is the practical significance of that distinction today?

2. In a suit for damages as a result of an automobile accident, a witness for the plaintiff mentions that the defendant has insurance. Counsel for the defendant moves for a mistrial. Should this motion be granted? Discuss.

3. (a) An automobile liability policy provided that the insured's truck was to be used for "Commercial purposes," but not including the towing of any trailer unless such use was definitely declared and rated. An accident occurred while the truck was towing a trailer. The policy did not provide any specific insurance for the trailer. The agent of the insurance company had knowledge of the use of the trailer at the time the policy was written. What were the rights of the insured?
   (b) Discuss the provisions of the New York Workmen's Compensation Law as respects the medical care of injured workmen.

4. (a) What is the principle of comity and what bearing has it on coverage provided by Compensation policies?
   (b) Certain employees of the Federal Government may recover compensation benefits provided by various state compensation laws while others may not. Upon what legal theories is this distinction based?

5. (a) What is the relation between risk and the uncertainty of loss?
   (b) Is the payment of insurance premium for the elimination or for the transfer of risk? Discuss.

6. Describe the "zone system" of conducting examinations of insurance companies. Discuss the reasons underlying the origin of this system, and possible complications with the usual methods.

7. State four or more grounds upon which the Superintendent of Insurance of the State of New York may apply for an order directing him to rehabilitate a domestic insurer.

8. Discuss Compulsory Automobile Insurance versus Statutory Compensation for persons injured in automobile accidents.

PART III

1. (a) Explain what is meant by "Formula Pure Premiums" in the Workmen's Compensation rate making procedure of the National Council.
   (b) State the purpose of, and method of calculating, loss development factors, projection factors, and contingency factors in Workmen's Compensation manual rate making. What restrictions, based on size of experience or on other considerations, are placed on the results of these calculations?

2. (a) In the Retrospective Rating Plan, the Basic, Minimum and Maximum Premiums are percentages of the "Standard" Premium. Define and explain each of the above terms of the Plan.

(b) A recent Massachusetts exhibit indicates that on the average risks written on a Retrospective basis are paying substantially less for coverage than if written on a guaranteed cost basis. Will this throw future Manual rates out of balance and if so, how would you compensate for it?

3. (a) State three conditions which any credibility formula should satisfy.
   (b) Describe the proposed Multi-split Method of modifying losses for Experience Rating.

4. (a) In the making of Automobile rates, the experience of the latest policy year, as of 12 months, is used. How is this data adjusted for ratemaking purposes?
   (b) In accordance with the Automobile Experience Rating Plan, how many times is each individual claim used in ratings over a period of years?

5. Give a broad outline of the statistical analysis necessary for the determination of loss constants.

6. What is the expected collectible effect of a 3% loading on losses applied through the factors of the Experience Rating Plan, and a 5% loading in the manual rates to correct the experience rating off-balance, having given

   Portion of business subject to experience rating .770
   Average credibility of experience rated risks .456

7. Discuss the relative importance of Incurred but "Not Reported" Reserves in Glass insurance, Automobile Liability insurance, and Fidelity bonding.

8. Describe a system of allocating administration expense to line of business and outline a punch-card which could be used under this system.

PART IV

1. Given the following data, prepare a statement of assets and liabilities, and income and disbursements, following the Annual Statement blank:

Gross premiums	$6,250,000
Premiums on policies not taken	215,000
Ledger assets as of Dec. 31 of previous year	2,000,000
Gross interest	40,000
Returned premiums on policies cancelled	312,000
Paid up capital	1,000,000
Taxes	67,000
Loss payments—gross	1,250,000
Loss on sale of stocks	20,000
Gross salvage	155,000
Profit on sale of bonds and real estate	32,000
Loss reserves	2,850,000
Investigation and adjustment expenses	240,000
Commissions	700,000
Salaries	380,000
Stockholders dividends	23,000
Book value of stocks and bonds	1,800,000
Book value of real estate	350,000
Furniture and fixtures	80,000
Market value of stocks and bonds	1,720,000
Market value of real estate	360,000
Premiums in course of collection	2,990,000
Interest due and accrued	39,000
Unearned premiums	3,100,000
Reserves for claim expenses	380,000
Other unpaid expenses	250,000
Cash in office and banks	1,130,000.

2. (a) A reinsurer stipulates that a primary carrier may recover only actual loss in excess of its retention after recovery under subrogation or from any source whatever. How would this apply to large claims sustained on a policy written on a Retrospective Basis?

   (b) In the Workmen's Compensation Retrospective Rating Plan of a given state, the loss conversion factor is 1.18, which provides for claim expenses and for taxes of 3½%. When a risk is written on an ex-medical basis, the ex-medical reduction under the standard procedure is 20%. Calculate the loss conversion factor for this risk, having first developed a general formula for the loss conversion factor on ex-medical risks.

3. A Connecticut Automobile Public Liability fleet risk has produced the following experience during a three year period.

	Manual Premium			
Car Years	Standard	Excess	No. Losses	Amt. of Losses
300	$15,000	$1,500	40	$7,000

There were no losses over $500, but 10 of the losses were over $400, the aggregate amount being $4,200. How would you

proceed to calculate a credit or debit from manual premium for this risk? What additional data, if any, would you require?

4. (a) Describe a method of calculating a reserve against periodic unfavorable loss ratios in Bonding lines. Why is such a reserve necessary?
   (b) Design a punch card for Automobile Liability premiums which could be used to provide data for rate-making calls, as well as to show premium volume by production and claim office.

5. (a) In the Compensation Manual there are somewhat more than 600 classifications. Many of these classifications are so small that their rates are always based on National experience. Outline the inequities resulting from this system and state what corrective changes might be made.
   (b) There are departures from the payroll basis in the New York Workmen's Compensation Manual regarding the coverage for window cleaning, building wrecking, and taxicab companies. Discuss the reasons leading to the adoption of such different measures of exposure and the efficacy of these measures.

6. Discuss the problem of "undesirable risks." Under what conditions and in what lines may this problem arise and what measures can you suggest to deal with the problem?

7. The New York Workmen's Compensation Law provides that self-insurers may secure the release of their deposits with the Industrial Commissioner upon furnishing the Commissioner with a policy covering all their future obligations up to a certain limit. Discuss the underwriting considerations of this form of coverage and suggest a method for the determination of premium rates.

8. Describe in detail a department designed for the underwriting of all lines for large risks in a multiple line casualty company. Describe in particular the relationship existing between this department and the departments underwriting individual lines.

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JAMES S. ELSTON, Editor

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Instalment Note Guarantees by Surety Companies. Luther E. Mackall.

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Is the Industrial Rating Plan a Necessary Part of the Workmen's Compensation Rating Structure? Sanford B. Perkins.

The Allocation of Adjusting Expense to Line of Insurance. William B. Bailey.

A System of Preparing Reserves on Workmen's Compensation Claims. A. N. Matthews.

Recent Developments With Respect to the Distribution of Workmen's Compensation Insurance Costs. Charles J. Haugh, Jr.

Interest Earnings as a Factor in Casualty Insurance Rate Making. B. D. Flynn.

Origin, Development and Practices of Livestock Insurance. Edwin W. Kopf.

Can Insurance Help the Unemployment Situation? I. M. Rubinow.

Financial Responsibility of Automobile Drivers. Edson S. Lott.

Life and Casualty Insurance in Japan and China. S. S. Huebner.

Livestock Insurance. W. A. Swain.

VOLUME XV NUMBER 31 PP. 136

Presidential Address of the Fifteenth Annual Meeting of the Casualty Actuarial Society. Sanford B. Perkins.

The Permanent Total Disability Provision in Life Insurance Policies. Edward B. Morris.

Compensation Reserves. E. Alfred Davies.

Claims. Charles Deckelman.

Claims. Herbert W. J. Hargrave.

Aircraft Insurance. Stephen B. Sweeney.

VOLUME XV NUMBER 32 PP. 160

Duties of the Present Day Casualty Actuary. George D. Moore.

Casualty Insurance Accounting and The Annual Statement Blank. Thomas F. Tarbell.

A Suggested Method for Developing Automobile Rates. H. T. Barber.

Recent Developments in Workmen's Compensation Insurance Rate Making. William F. Roeber.

Massachusetts Compulsory Automobile Liability Insurance. W. J. Constable.

The Relation of the Insurance Department of the Chamber of Commerce of the United States to the Casualty Insurance Business. Terence F. Cunneen.

PAPERS IN THE PROCEEDINGS

VOLUME XVI NUMBER 33 PP. 282

New York Motor Vehicle Financial Responsibility Act. George D. Moore.

Trade Union Benefits and Our Social Insurance Problems. Rainard B. Robbins.

The Origin and Development of Reinsurance. Edwin W. Kopf.

Double Indemnity in Life Insurance Policies. Henry H. Jackson.

The Analysis of Expenses by the Use of Hollerith Cards. H. O. Van Tuyl.

Exhibits and Schedules of the Casualty Annual Statement Blank. Thomas F. Tarbell.

Relation of Accident Statistics to Industrial Accident Prevention. H. W. Heinrich.

VOLUME XVI NUMBER 34 PP. 167

A Review of the 1929 Casualty Business. George D. Moore.

Credibility and Automobile Rate Making. Roy A. Wheeler.

Statistical Methods for Casualty Companies by Use of the Eighty Column Hollerith System. Norton E. Masterson.

Notes on Exposure and Premium Bases. Paul Dorweiler.

Motor Vehicle Safety Responsibility Legislation. Austin J. Lilly.

VOLUME XVII NUMBER 35 PP. 160

Current Problems in Casualty Insurance Statistical Work. George D. Moore.

State Old Age Pensions in the United States. W. Rulon Williamson.

The Theory of the Distribution of the Expenses of Casualty Insurance. F. S. Perryman.

A Method of Testing Loss Reserves. W. P. Comstock.

The Actuarial Basis for Premiums and Reserves in Personal Accident and Health Insurance. James D. Craig.

Disability Insurance in Connection with Regular Life Insurance Contracts in Switzerland. Emile Marchand.

VOLUME XVII NUMBER 36 PP. 191

Unemployment and Insurance. Thomas F. Tarbell.

The Function of Administrative Statistics in Casualty Insurance. Robert S. Hull.

The New York Unit Statistical Plan; A Method of Preparing and Reporting Data and Analyzing the Carrier's Business. Charles M. Graham.

A Suggested Modification in the Policy Year Method of Compiling Experience Data for the Making of Automobile Insurance Rates. Joseph Linder.

The Place of Conservation in Insurance. Albert W. Whitney.

The New French Social Insurance Law. Albert H. Mowbray.

PAPERS IN THE PROCEEDINGS

VOLUME XVIII NUMBER 37 PP. 252

Some Responsibilities of Membership. Thomas F. Tarbell.

The Contract of Personal Accident and Health Insurance. Stewart M. La Mont.

Procedure in the Examination of Casualty Companies by Insurance Departments. Emma C. Maycrink.

A Method of Assembling and Analyzing the Data Reported under the Unit Statistical Plan. Mark Kormes.

On Variations in Compensation Losses with Changes in Wage Levels. Paul Dorweiler.

VOLUME XVIII NUMBER 38 PP. 279

Business Cycles and Casualty Insurance. Thomas F. Tarbell.

Criticisms and Answers. Gustav F. Michelbacher.

The Attitude of the Courts in Construing the Workmen's Compensation Act. Clarence W. Hobbs.

The Chemical and Dyestuff Rating Plan. Harry F. Richardson.

Marriage and Birth Insurances in France. Henri Balu.

VOLUME XIX NUMBER 39 PP. 214

The Effect of Changes in Values on Casualty Insurance. Thomas F. Tarbell.

Wisconsin Unemployment Compensation Act. William H. Burhop.

Ten Years of Rates and Rating Bureaus in Ontario, Applied to Automobile Insurance. John Edwards.

Some Notes on Credibility. F. S. Perryman.

Actuarial, Statistical and Related Organizations in the United States and Abroad. James S. Elston.

VOLUME XIX NUMBER 40 PP. 202

Reflections on Some Fundamentals of Casualty Insurance. Paul Dorweiler.

Is the Rate Making Plan the Chief Trouble with Compensation Insurance? Winfield W. Greene.

Aviation Casualty Insurance. W. P. Comstock.

Calculation of the Cost of Unemployment Benefits (with Particular Reference to Ohio and Pennsylvania). Clarence A. Kulp.

An American Remarriage Table. William F. Roeber and Ralph M. Marshall.

VOLUME XX NUMBER 41 PP. 254

Policy Limits in Casualty Insurance. Paul Dorweiler.

Ten Years of Rates and Rating Bureaus in Ontario, Applied to Automobile Insurance. John Edwards.

A Realistic Plan for Determining Compensation Rate Levels. Leon S. Senior.

Correction of Certain Deficiencies in the Experience Rating Plan by the So-Called "Accounts Current" Method. Mark Kormes.

Rate Levels for Workmen's Compensation Insurance. F. S. Perryman.

On Indeterminate Reserve Tables for Compensation. N. M. Valerius.

VOLUME XX NUMBER 42 PP. 162

Some Aspects of Statistics in Casualty Insurance. Paul Dorweiler.
Suggestions for a Standard System of Notation in Casualty Actuarial Work. Thomas O. Carlson.
Incurred But Not Reported Claim Reserves. Thomas F. Tarbell.
Valuation of Investments. Joseph J. Magrath.
Index Numbers of Compensation Insurance Rate Levels. Paul Dorweiler and Nels M. Valerius.

SECOND INDEX TO THE PROCEEDINGS

James S. Elston, Editor

The Index to the Proceedings of the second ten volumes (comprising Numbers 23 to 42) comprises a general index of all the Papers, Discussions and Book Reviews presented by the members of the Society and an index to the Legal Notes. The contributions of every member are shown in detail and each Paper has been cross-indexed by title and by the principal subtopics. This is complete as respects all of the publications of the Society from November 20, 1924 to November 21, 1934. The index comprises 113 pages and is bound in buckram.

VOLUME XXI NUMBER 43 PP. 240

A Survey of Risk Credibility in Experience Rating. Paul Dorweiler.
Product Public Liability Insurance. James M. Cahill.
The Control of Accidents Through Workmen's Compensation Rating. Robert S. Hull.
Reports of Casualty Insurance—Loss Reserve Schedules. John R. Lange.
Comment on the Underwriting of Compensation for Silicosis. Robert V. Sinnott.
Compensation Expenses Per Policy. Harmon T. Barber.
The Experience Rating Plan as Applied to Workmen's Compensation Risks. Mark Kormes.
The Economic and Financial Outlook and the Casualty Business. Jules I. Bogen.
The Younger Generation. Thomas O. Carlson.

VOLUME XXI NUMBER 44 PP. 202

The Chief Trouble With Workmen's Compensation Insurance. Winfield W. Greene.
History and Present Status of Non-cancellable Accident and Health Insurance. John H. Miller.
A Statistical Analysis of the Benefit Provisions of the Compensation Acts. J. J. Smick.
Recent Developments in Commercial Accident and Health Insurance. Ward Van Buren Hart.
Commercial Accident and Health Insurance from the Standpoint of the Reinsurance Company. Howard G. Crane.

VOLUME XXII NUMBER 45 PP. 211

Broadening the Market for Casualty Insurance. Winfield W. Greene.
Distribution of Inspection Cost by Line of Insurance. Harry V. Waite.
Social Insurance and the Constitution. Clarence W. Hobbs.
Occupational Disease Cover in New York. Arthur G. Smith.
Group Rate Levels in Workmen's Compensation Insurance. M. H. McConnell, Jr.
The Experience Rating Plan as Applied to Workmen's Compensation Risks. Part II. Mark Kormes.

PAPERS IN THE PROCEEDINGS

VOLUME XXII NUMBER 46 PP. 200

Some Comments on Economic Theory. Winfield W. Greene.

The Extra-Territorial Application of Compensation Acts. Clarence W. Hobbs.

VOLUME XXIII NUMBER 47 PP. 134

State Monopoly of Compensation Insurance, Laboratory Test of Government in Business. Winfield W. Greene.

Deductible and Excess Coverages, Liability and Property Damage Lines Other Than Automobile. James M. Cahill.

Small Risks versus Large Risks in Workmen's Compensation Insurance. Mark Kormes.

On the Use of Synthetic Risks in Determining Pure Premium Excess Ratios for Large Compensation and Liability Risks. Paul Dorweiler.

VOLUME XXIII NUMBER 48 PP. 196

Social and Economic Factors Relating to Casualty Insurance. Leon S. Senior.

Can We Improve the Compensation Rating Method? Harmon T. Barber.

Automobile Insurance in the Province of Ontario. John Edwards.

Some Aspects of the Retrospective and Supplementary Rating Plans. Joseph J. Magrath.

Federal Jurisdiction and the Compensation Acts. Clarence W. Hobbs.

VOLUME XXIV NUMBER 49 PP. 232

An Outline of Current Problems in Workmen's Compensation. Leon S. Senior.

Social Budgeting. W. R. Williamson.

Pure Premiums for Compensation Insurance. Arthur G. Smith.

The Distribution of Casualty Administration Expense by Line of Insurance. Thomas F. Tarbell and Harry V. Waite.

Experience Rating Plan Credibilities. Francis S. Perryman.

VOLUME XXIV NUMBER 50 PP. 266

Principles of Equity Applies to Casualty and Other Forms of Insurance. Leon S. Senior.

Special Funds Under the New York Compensation Law. Grady H. Hipp.

Graduation of an American Remarriage Table for Joint Life Annuities. Edward Olifiers.

The Retrospective Rating Plan for Workmen's Compensation Risks. Sydney D. Pinney.

VOLUME XXV NUMBER 51 PP. 290

Experience Rating on the Road to Reform. Leon S. Senior.

Surety Rate Making. An Approach to the Subject. Edward C. Lunt.

Aviation Insurance. Barbara H. Woodward.

Watch Your Statistics. G. F. Michelbacher.

Tables Adapted for Machine Computation. Francis S. Perryman.

Problems in Relation to Contractual Liability Insurance. John W. Ainley.

PAPERS IN THE PROCEEDINGS

VOLUME XXV NUMBER 52 PP. 192

The Casualty Actuary. Francis S. Perryman.

Additional Index Numbers of Compensation Rate Levels. Nels M. Valerius.

Federal vs. State Supervision of Insurance. Rainard B. Robbins.

VOLUME XXVI NUMBER 53 PP. 280

The First Twenty-Five Years. Francis S. Perryman.

Contingency Loading—New York Compensation Insurance. James M. Cahill.

Policy Year Modification of Losses. Russell P. Goddard.

The Practice of Workmen's Compensation Ratemaking as Illustrated by the 1939 Revision of New York Rates. Charles M. Graham.

Merit Rating—The Proposed Multi-Split Experience Rating Plan and the Present Experience Rating Plan. J. J. Smick.

State Monopoly of Compensation Insurance Rates—Laboratory Test of Government In Business. Part II. Winfield W. Greene.

Reminiscences of a Charter Member. Leon S. Senior.

CASUALTY ACTUARIAL SOCIETY

Recommendations for Study

EDUCATIONAL COMMITTEE

JAMES M. CAHILL, *Chairman*

WILLIAM H. BURLING	EMMA C. MAYCRINK
CLARENCE A. KULP	ALBERT Z. SKELDING
DANIEL J. LYONS	NELS M. VALERIUS
NORTON E. MASTERSON	THOMAS O. CARLSON (*ex-officio*)

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RULES REGARDING EXAMINATIONS FOR ADMISSION TO THE CASUALTY ACTUARIAL SOCIETY

1. **Dates of Examination.**

Examinations will be held on the third Wednesday and following Thursday during the month of May in each year in such cities as will be convenient for three or more candidates.

2. **Filing of Application.**

Application for admission to examination should be made on the Society's blank form, which may be obtained from the Secretary-Treasurer. No applications will be considered unless received before the fifteenth day of February preceding the dates of examination. Applications should definitely state for what parts the candidate will appear.

3. **Fees.**

The examination fee is $2.00 for each part, with a minimum of $5.00 for each year in which the candidate presents himself; thus for one or two parts, $5.00, for three parts, $6.00, etc. Examination fees are payable to the order of the Society and must be received by the Secretary-Treasurer before the fifteenth day of February preceding the dates of examination.

4. **Associateship and Fellowship Examinations.**

(a) The examination for Associateship consists of five parts and that for Fellowship consists of three parts. A candidate may take any one or more of the five parts of the Associateship Examination. No candidate will be permitted to present himself for any part of the Fellowship Examination unless he has previously passed, or shall concurrently present himself for and submit papers for, all parts of the Associateship Examination and all preceding parts of the Fellowship Examination. Subject to the foregoing requirement, the candidate will be given credit for any part or parts of either examination which he may pass.

(b) A candidate who has passed Associateship Parts I-IV prior to 1941, but who has not been enrolled as an Associate because of lack of the experience qualifications required by the examination rules effective prior to 1941, will be enrolled as an Associate upon passing Part V. Such a candidate may also take Fellowship Examination Parts I-III in the same year as Associateship Part V, subject to the provisions of paragraph (a) above.

(c) An Associate who has passed no part of the Fellowship Examination under the Syllabus effective prior to 1941 is required, in order to qualify for admission as a Fellow, to pass Associateship Examination Part V and Fellowship Examination Parts I-III.

(d) A candidate who has passed one or more parts of the Associateship or Fellowship Examinations under the Syllabus effective prior to 1941 will receive credit for the corresponding parts of the new Syllabus in accordance with the following table:

Parts Passed Under Old Syllabus (Effective Prior to 1941)	*Parts Credited Under New Syllabus* (Effective in 1941)
Associateship, Part I	Associateship, Part I
" " II	" " III
" " III	" " II
" " IV	" " IV
Fellowship, Part I	" " V
" " II	Fellowship, Part I
" Parts III & IV	" Parts II & III

Other combinations of Fellowship parts passed under the old Syllabus will receive special attention by the Educational Committee to determine the credit allowable and the further examinations required to obtain full credit for all Fellowship parts under the new Syllabus.

5. Alternative to Passing of Fellowship Parts II and III.

As an alternative to the passing of Parts II and III of the Fellowship Examination, a candidate may elect to present an original thesis on an approved subject relating to casualty or social insurance. Such thesis must show evidence of ability for original research and the solution of advanced problems in casualty insurance comparable with that required to pass Parts II

and III of the Fellowship Examination, and shall not consist solely of data of an historical nature. Candidates electing this alternative should communicate with the Secretary-Treasurer and obtain through him approval by the Examination Committee of the subject of the thesis. In communicating with the Secretary-Treasurer, the candidate should state, in addition to the subject of the thesis, the main divisions of the subject and general method of treatment, the approximate number of words and the approximate proportion to be devoted to data of an historical nature. All theses must be in the hands of the Secretary-Treasurer before the third Wednesday in May of the year in which they are to be considered. Where Part I of the Fellowship Examination is not taken during the same year, no examination fee will be required in connection with the presentation of a thesis. All theses submitted are, if accepted, to be the property of the Society and may, with the approval of the Council, be printed in the *Proceedings*.

6. Waiver of Examinations for Associate.

The examinations for Associate will be waived under Article III of the Constitution only in case of those candidates who meet the following qualifications and requirements:

(a) The candidate shall be at least thirty-five years of age.

(b) The candidate shall have had at least ten years' experience in casualty actuarial or statistical work or in a phase of casualty insurance which requires a working knowledge of actuarial or statistical procedure or in the teaching of casualty insurance principles in colleges or universities. Experience limited exclusively to the field of accident and health insurance shall not be admissible.

(c) For the two years preceding date of application, the candidate shall have been in responsible charge of the actuarial or statistical department of a casualty insurance organization or of an important division of such department or shall have occupied an executive position in connection with the phase of casualty work in which he is engaged, or, if engaged in teaching, shall have attained the status of a professor.

(d) The candidate shall have submitted a thesis approved by the Examination Committee. Such thesis must show evidence of original research and knowledge of casualty insurance and shall

not consist solely of data of an historical nature. Candidates electing this alternative should communicate with the Secretary-Treasurer and obtain through him approval by the Examination Committee of the subject of the thesis. In communicating with the Secretary-Treasurer, the candidate should state, in addition to the subject of the thesis, the main divisions of the subject and general method of treatment, the approximate number of words and the approximate proportion to be devoted to data of an historical nature.

LIBRARY

The Society's library contains all of the references listed in the Recommendations for Study with the exception of certain periodicals and publications subject to periodical revision. It also contains numerous other works on casualty actuarial matters. Registered students may have access to the library by receiving from the Society's Secretary the necessary credentials. Books may be withdrawn from the library for a period of two weeks upon payment of a small service fee and necessary postage.

The library is in the immediate charge of Miss Mabel B. Swerig, Librarian of the Insurance Society of New York, 107 William Street, New York City.

SYLLABUS OF EXAMINATIONS
(Effective 1941 and Thereafter)

ASSOCIATESHIP

Part	*Sections*	*Subjects*
I	1	Algebra.
	2	Compound Interest and Annuities Certain.
II	3	Differential and Integral Calculus.
	4	Calculus of Finite Differences.
III	5	Descriptive and Analytical Statistics.
	6	Elements of Accounting, Including Corporate Accounting.
IV	7	Probabilities.
	8	Life Contingencies, Life Annuities and Life Assurances.
V	9	Policy Forms and Underwriting Practice in Casualty Insurance.
	10	Casualty Insurance Rate Making Procedure.

FELLOWSHIP

I	11	Investments of Insurance Companies.
	12	Insurance Law and Legislation.
	13	Insurance Economics.
II	14	Determination of Premium, Loss and Expense Reserves.
	15	Advanced Problems in Casualty Insurance Statistics.
	16	Advanced Problems in Casualty Insurance Accounting.
III	17	Individual Risk Rating.
	18	Social Insurance.
	19	Advanced Problems in the Underwriting and Administration of Casualty Insurance.

RECOMMENDATIONS FOR STUDY

The examinations for admission to the two grades of membership in the Society are designed to establish the qualifications of candidates. The following Recommendations for Study are provided as a guide for the candidates in their preparation for the examinations. It should be realized that although the examination questions will be based upon the textual material cited, they will not necessarily be drawn directly therefrom. The examinations will test not only the candidate's knowledge of the subject matter but also his ability to apply that knowledge.

Under the mathematical parts (Sections 1-8) of the Associateship Examination, there are listed a few sources of examples in addition to those found in the texts cited. Candidates are advised to work out as many examples as possible in their study of these sections in order to acquire facility in the application of the mathematical principles and methods to specific problems.

In preparing for the Associateship Part V and the Fellowship Examinations, the candidate should be familiar with pertinent papers published in the *Proceedings* of the Casualty Actuarial Society for the May, 1940 and subsequent meetings and with the Current Notes in the *Proceedings* for recent years, in addition to the references cited. The candidate should also read at least one insurance journal for the year preceding his examination in order to be familiar with current developments.

The references to papers in the *Proceedings* of the Casualty Actuarial Society (denoted by P.C.A.S.) and in the *Transactions* of the Actuarial Society of America (denoted by T.A.S.A.) are considered to include all discussions of these papers in these publications, though the page references cited refer to the papers only.

Description of texts cited will be found in the Index at the end of these Recommendations.

Candidates can review the examinations given in previous years by referring to the reprints contained in both the annual Year Book and the *Proceedings* of the Society. Copies of the examinations for recent years may be obtained from the Secretary-Treasurer.

ASSOCIATESHIP: PART I

Section 1. Algebra.

The candidate should have thorough preparation in elementary and intermediate high school algebra and in business arithmetic as a prerequisite to the study of the reference text.

Hall and Knight: Higher Algebra. Chapters 1-5, 8-14 and 16.

Whitworth, W. A.: Choice and Chance. (Included as a source of additional examples in permutations and combinations.)

Section 2. Compound Interest and Annuities Certain.

Rietz, Crathorne and Rietz: Mathematics of Finance. Chapters 1-7.

Skinner, E. B.: Mathematical Theory of Investment. (Included as a source of additional examples.)

ASSOCIATESHIP: PART II

Section 3. Differential and Integral Calculus.

Granville, Smith and Longley: Elements of the Differential and Integral Calculus. Chapters 1-16, 19, 20 and 22.

Section 4. Calculus of Finite Differences.

Freeman, Harry: Mathematics for Actuarial Students; Part II—Finite Differences, Probability and Elementary Statistics. Chapters 1-7 and 9.

ASSOCIATESHIP: PART III

Section 5. Descriptive and Analytical Statistics.

Richardson, C. H.: An Introduction to Statistical Analysis.

Section 6. Elements of Accounting, Including Corporate Accounting.

Kester, R. B.: Principles of Accounting. Chapters 1-15, 18-20 and 26.

ASSOCIATESHIP: PART IV

Section 7. Probabilities.

Hall and Knight: Higher Algebra. Chapter 32.

Freeman, Harry: Mathematics for Actuarial Students; Part II—Finite Differences, Probability and Elementary Statistics. Chapter 10.

Whitworth, W. A.: Choice and Chance. (Included as a source of additional examples.)

Section 8. Life Contingencies, Life Annuities and Life Assurances.

Menge and Glover: An Introduction to the Mathematics of Life Insurance.

Dowling, L. Wayland: Mathematics of Life Insurance. Chapter 9.

Department of Labor, State of New York: Special Bulletin No. 190, Workmen's Compensation Tables.

Greene, W. W.: Valuation of the Death Benefits Provided by the New York Compensation Law. P.C.A.S. I, 31.

Olifiers, Edward: Valuation of the Death Benefits Provided by the Workmen's Compensation Law of New York. T.A.S.A. XVI, 83.

Fondiller, Richard: Tables for Computing the Present Value of Death Benefits Arising Under the New York Workmen's Compensation Law. P.C.A.S. II, 110.

The candidate should have a working knowledge of the tables set forth in Special Bulletin No. 190, published by the New York Department of Labor. The cited paper by Fondiller will be of particular help in this regard, although his examples are based on an earlier edition of the tables. The cited papers by Greene and Olifiers should be read for an understanding of the theory underlying certain of the tables, but the candidate will not be required to reproduce the derivation of the formulas contained therein.

ASSOCIATESHIP: PART V

Section 9. Policy Forms and Underwriting Practice in Casualty Insurance.

Section 10. Casualty Insurance Rate Making Procedure.

The first two general references cited below should be considered as introductory to the study of the material included under both of these sections.

The cited texts by Sawyer and Hobbs contain detailed analyses of the standard policy contracts for automobile liability and for workmen's compensation, and other references cited discuss the contracts for other casualty lines. The candidate should also study copies of the actual contracts currently used, however, in order to be up-to-date regarding policy provisions. Since the manual provisions change from time to time, it is essential that the candi-

date not depend entirely on the material given in the references; this material should be supplemented by careful study of current manuals. The candidate should further be familiar with the bases of exposure used in the respective lines and with the manual rate making procedure.

It should be noted that the material under Section 10 does not include the actuarial principles underlying the respective individual risk rating plans and the determination of deductible and excess coverage rates, even though certain of the references encompass some material on these topics.

(a) *General.*

Kulp, C. A.: Casualty Insurance. Chapters 2, 3 and 15-25.

Michelbacher, G. F. and Associates: Casualty Insurance Principles. Chapters 1, 5-7, 12 and 13.

Dorweiler, Paul: Notes on Exposure and Premium Bases. P.C.A.S. XVI, 319.

Perryman, F. S.: Some Notes on Credibility. P.C.A.S. XIX, 65.

The important manuals to be reviewed are published by the following organizations:

Fidelity, Forgery and Surety Bonds; Towner Rating Bureau, Inc., 60 John Street, New York.

Workmen's Compensation and Employers' Liability Insurance; National Council on Compensation Insurance, 45 East 17th Street, New York.

Manuals for Boiler and Machinery, Burglary, Glass and the respective Liability lines; National Bureau of Casualty and Surety Underwriters, 60 John Street, New York.

Important material on the determination of manual rates is contained in the reports on the examination of the following rate making organizations by the New York Insurance Department:

Board of Aviation Underwriters
Compensation Insurance Rating Board
Mutual Casualty Insurance Rating Bureau
National Bureau of Casualty and Surety Underwriters
Towner Rating Bureau

These reports appear at intervals of three or five years, being published in Part III of the annual New York Insurance Report.

In addition, reference should be made to the three latest reports of the National Association of Insurance Commissioners.

(b) *Accident and Health.*

Craig, J. D.: The Actuarial Basis for Premiums and Reserves in Personal Accident and Health Insurance. P.C.A.S. XVII, 51.

LaMont, S. M.: The Contract of Personal Accident and Health Insurance. P.C.A.S. XVIII, 9.

Miller, J. H.: History and Present Status of Non-Cancellable Accident and Health Insurance. P.C.A.S. XXI, 235.

Hart, W. V. B.: Recent Developments in Commercial Accident and Health Insurance. P.C.A.S. XXI, 291.

(c) *Automobile Liability.*

Sawyer, E. W.: Automobile Liability Insurance, An Analysis of the National Standard Policy Provisions.

Informal Discussion: Automobile Liability Insurance. P.C.A.S. XXII, 133.

(d) *Aviation.*

Comstock, W. P.: Aviation Casualty Insurance. P.C.A.S. XIX, 246.

Woodward, B. H.: Aviation Insurance. P.C.A.S. XXV, 81.

(e) *Fidelity and Surety.*

Crist, G. W. Jr.: Corporate Suretyship. Except Chapter 7.

Lunt, E. C.: Surety Rate Making. P.C.A.S. XXV, 16.

Informal Discussion: Surety Rate Making. P.C.A.S. XXV, 180.

(f) *Workmen's Compensation.*

The candidate should be familiar with the general rate making methods used by the National Council on Compensation Insurance, together with the modifications adopted in New York.

Hobbs, C. W.: Workmen's Compensation Insurance. Chapters 1-4, 6-10, 12, 13 and 16-18.

Hobbs, C. W.: Annual Report to the National Association of Insurance Commissioners Relative to the National Council on Compensation Insurance. Latest three annual reports.

Greene, W. W. and Roeber, W. F.: The "Permanent" Rate Making Method Adopted by the National Council on Compensation Insurance. P.C.A.S. XII, 253.

Roeber, W. F.: Recent Developments in Workmen's Compensation Insurance Rate Making. P.C.A.S. XV, 223.

Graham, C. M.: The Practice of Workmen's Compensation Rate Making as Illustrated by the 1939 Revision of New York Rates. P.C.A.S. XXVI, 47.

Section 11. Investments of Insurance Companies.

Preparation in the principles of economics is a prerequisite to the study of the following texts:

Moulton, H. G.: Financial Organization and the Economic System.
Jordan, D. F.: Investments.
Blackall, J. C.: Stocks and Bonds as Insurance Company Investments. Proceedings, National Association of Insurance Commissioners, 1936, 91.
Informal Discussion: Investments of Casualty Insurance Companies. P.C.A.S. XXIV, 141.

In order that the candidate may be informed of recent developments and trends, he should read the financial page of one of the prominent daily papers and the recent issues of some bulletin such as the Monthly Bulletin of the National City Bank of New York. In addition, Best's Insurance News (Fire and Casualty Edition) for the most recent year should be reviewed for articles relating to insurance company investments.

Section 12. Insurance Law and Legislation.

(a) *Introduction to the Law.*

Stone, H. F.: Law and Its Administration.
Conyngton, T. and Bergh, L. O.: Business Law.

(b) *Principles of the Law of Insurance.*

Patterson, E. W.: Essentials of Insurance Law. Chapters 2, 3 and 5-12.

(c) *Current Legal Decisions.*

Legal Notes. P.C.A.S. for the three most recent years.

The leading insurance periodicals include articles on important current legal decisions.

(d) *Supervision, Regulation and Taxation of Insurance.*

Hobbs, C. W.: Workmen's Compensation Insurance. Chapters 5 and 15.
Michelbacher, G. F. and Associates: Casualty Insurance Principles. Chapter 4.
Patterson, E. W.: Essentials of Insurance Law. Chapter 1.
New York Insurance Law (as recodified in 1939): Articles I-V, VII, VIII, IX-C, X and XVII.
Maycrink, E. C.: Procedure in the Examination of Casualty Companies by Insurance Departments. P.C.A.S. XVIII, 81.
Informal Discussion: State Regulation of Rates. P.C.A.S. XXII, 339.

Section 13. Insurance Economics.

Willett, A. H.: Economic Theory of Risk and Insurance.
Kulp, C. A.: Casualty Insurance. Chapter 1.

FELLOWSHIP: PART II

Section 14. Determination of Premium, Loss and Expense Reserves.

Michelbacher, G. F. and Associates: Casualty Insurance Principles. Chapter 9.

Black, N. C.: Method of Setting Up Reserve to Cover Incurred But Not Reported Loss Liability. P.C.A.S. XIV, 9.

Matthews, A. N.: A System of Preparing Reserves on Workmen's Compensation Claims. P.C.A.S. XIV, 244.

Craig, J. D.: The Actuarial Basis for Premiums and Reserves in Personal Accident and Health Insurance. P.C.A.S. XVII, 51.

Report of the Committee on Compensation and Liability Loss Reserves. P.C.A.S. XVII, 137, 333.

Roeber, W. F. and Marshall, R. M.: An American Remarriage Table. P.C.A.S. XIX, 279.

Valerius, N. M.: On Indeterminate Reserve Tables for Compensation. P.C.A.S. XX, 82.

Tarbell, T. F.: Incurred But Not Reported Claim Reserves. P.C.A.S. XX, 275.

Informal Discussion: Reserves Against the Recurrence of an Unfavorable Loss Ratio in the Bonding Lines. P.C.A.S. XXIII, 269.

Informal Discussion: Premiums and Loss Reserves for Casualty and Bonding Insurance. P.C.A.S. XXV, 366.

Department of Labor, State of New York: Special Bulletin No. 190, Workmen's Compensation Tables.

The candidate should have knowledge of the provisions of Section 326 of the New York Insurance Law (as recodified in 1939): loss and loss expense reserves of casualty insurance and surety companies. The convention form of annual statement blank for casualty companies sets forth in Schedule "P" the statutory loss reserve requirements for the liability and compensation lines. This schedule should be studied carefully.

Section 15. Advanced Problems in Casualty Insurance Statistics.

This section includes readings which cover: (a) the planning and use of internal statistical materials, and the compilation and presentation of casualty insurance statistics for administrative

and rate making purposes; and (b) sources and uses of external statistics particularly as they may be required in casualty insurance administration and rate making.

(a) *Internal Statistics.*

In addition to the references cited, the candidate should study the various statistical plans used in casualty insurance. The important plans are published by the following organizations:

Personal Accident and Health Statistical Plan; Bureau of Personal Accident and Health Underwriters, 60 John Street, New York.

Schedule "Z" and the Unit Statistical Plan for Workmen's Compensation; National Council on Compensation Insurance, 45 East 17th Street, New York.

Standard Fidelity, Surety and Forgery Classification Code; Towner Rating Bureau, Inc., 60 John Street, New York.

Statistical plans for Burglary, Glass and the respective Liability lines; National Bureau of Casualty and Surety Underwriters, 60 John Street, New York.

Michelbacher, G. F. and Associates: Casualty Insurance Principles. Chapter 10.

Crist, G. W. Jr.: Corporate Suretyship. Chapter 7.

Hobbs, C. W.: Workmen's Compensation Insurance. Chapter 16.

Linder, Joseph: The Function and Place of the Statistical Department in a Multiple Line Casualty Company. P.C.A.S. XIV, 27.

Masterson, N. E.: Statistical Methods for Casualty Companies by Use of the Eighty Column Hollerith System. P.C.A.S. XVI, 288.

Graham, C. M.: The New York Unit Statistical Plan; A Method of Preparing and Reporting Data and Analyzing the Carrier's Business. P.C.A.S. XVII, 190.

Kormes, Mark: A Method of Assembling and Analyzing the Data Reported Under the Unit Statistical Plan. P.C.A.S. XVIII, 99.

(b) *External Statistics.*

The candidate should endeavor to become acquainted with as many sources of external statistics as possible so as to know where to obtain the necessary information in connection with the solution of problems arising in the casualty insurance business. The following is a representative but limited list of such sources:

Board of Governors of the Federal Reserve System: Federal Reserve Bulletin (monthly).

Central Statistical Board: Statistical Services and Activities of the United States.

Department of Labor, State of New York: Industrial Bulletin (monthly).

Schmeckebier, L. F.: Statistical Work of the National Government.

United States Department of Commerce: Survey of Current Business (monthly).

United States Department of Labor, Bureau of Labor Statistics: Monthly Labor Review.

United States Department of Labor, Bureau of Labor Statistics: Methods of Procuring and Computing Statistics. Bulletin 326.

Section 16. Advanced Problems in Casualty Insurance Accounting.

The candidate should acquire a thorough knowledge of the purposes, details and sources of the accounts set forth in the current convention form of annual statement blank (with accompanying schedules) for casualty companies and in the New York Casualty Experience Exhibit.

The objective of the candidate should be the development, through discussion with persons actively engaged in this field and through critical reading, of facility in solving accounting problems of the kind that come to the actuary of a general casualty company.

Hull, R. S.: Casualty Insurance Accounting.

Michelbacher, G. F. and Associates: Casualty Insurance Principles. Chapter 19.

Hobbs, C. W.: Workmen's Compensation Insurance. Chapter 14.

Tarbell, T. F.: Determination of Acquisition and Field Supervision Cost by Lines of Business for Casualty Insurance. P.C.A.S. X, 107.

Tarbell, T. F.: Accounting Methods for Casualty Companies by Use of the Hollerith System. P.C.A.S. XII, 215.

Bailey, W. B.: The Allocation of Adjusting Expense to Line of Insurance. P.C.A.S. XIV, 233.

Tarbell, T. F.: Casualty Insurance Accounting and the Annual Statement Blank. P.C.A.S. XV, 141.

Van Tuyl, H. O.: The Analysis of Expenses by the Use of Hollerith Cards P.C.A.S. XVI, 121.

Tarbell, T. F.: Exhibits and Schedules of the Casualty Annual Statement Blank. P.C.A.S. XVI, 131.

Perryman, F. S.: The Theory of the Distribution of the Expenses of Casualty Insurance. P.C.A.S. XVII, 22.

Magrath, J. J.: Valuation of Investments. P.C.A.S. XX, 281.

Barber, H. T.: Compensation Expenses Per Policy. P.C.A.S. XXI, 65.

Waite, H. V.: Distribution of Inspection Cost by Line of Insurance. P.C.A.S. XXII, 15.

Tarbell, T. F. and Waite, H. V.: The Distribution of Casualty Administration Expense by Line of Insurance. P.C.A.S. XXIV, 45.

FELLOWSHIP: PART III

Section 17. Individual Risk Rating.

The candidate should carefully study the following rating plans and the forms used in the application thereof:

Automobile Liability Experience Rating Plan (National Bureau of Casualty and Surety Underwriters).

Burglary Experience Rating Plan (National Bureau of Casualty and Surety Underwriters).

Garage Schedule Rating (No printed plan. Rating form obtainable from National Bureau of Casualty and Surety Underwriters).

Glass Experience Rating Plan (National Bureau of Casualty and Surety Underwriters).

Public Liability Experience Rating Plan (National Bureau of Casualty and Surety Underwriters).

Industrial Compensation Rating Schedule (National Council on Compensation Insurance).

Workmen's Compensation Experience Rating Plan (National Council on Compensation Insurance).

Workmen's Compensation Retrospective Rating Plan (National Council on Compensation Insurance).

The candidate is advised to read the references in the books by Michelbacher and Hobbs to obtain the general principles underlying individual risk rating prior to studying the respective plans and the technical articles cited from the *Proceedings*. It should be noted that the general subject of individual risk rating includes the determination of rates for coverages other than full coverage, such as deductible, excess and aggregate stop loss.

Michelbacher, G. F. and Associates: Casualty Insurance Principles. Chapter 8.

Hobbs, C. W.: Workmen's Compensation Insurance. Chapters 17 and 18.

Whitney, A. W.: The Theory of Experience Rating. P.C.A.S. IV, 274.

Keffer, Ralph: An Experience Rating Formula. T.A.S.A. XXX, 130.

Perkins, S. B. and Wheeler, R. A.: 1922 Revision of the Industrial Compensation Rating Schedule. P.C.A.S. IX, 11.

Richardson, H. F.: Some Developments in Schedule Rating Since the Adoption of the Industrial Compensation Rating Schedule, 1923. P.C.A.S. XIII, 29.

Dorweiler, Paul: Observations on Making Rates for Excess Compensation Insurance. P.C.A.S. XIII, 154.

Richardson, H. F.: The Chemical and Dyestuff Rating Plan. P.C.A.S. XVIII, 385.

Dorweiler, Paul: A Survey of Risk Credibility in Experience Rating. P.C.A.S. XXI, 1.

Kormes, Mark: The Experience Rating Plan as Applied to Workmen's Compensation Risks. P.C.A.S. XXI, 81; XXII, 81.

Cahill, J. M.: Deductible and Excess Coverages, Liability and Property Damage Lines Other Than Automobile. P.C.A.S. XXIII, 18.

Perryman, F. S.: Experience Rating Plan Credibilities. P.C.A.S. XXIV, 60.

Pinney, S. D.: The Retrospective Rating Plan for Workmen's Compensation Risks. P.C.A.S. XXIV, 291.

Smick, J. J.: Merit Rating—The Proposed Multi-Split Experience Rating Plan and the Present Experience Rating Plan. P.C.A.S. XXVI, 84.

The reports, cited in Section 10, on the examination of rate making organizations by the New York Insurance Department should also be referred to for such information as is contained therein on individual risk rating plans.

Section 18. Social Insurance.

(a) *General.*

U. S. Social Security Board: Social Security in America. Parts I, II, Appendices 1, 2, 3, 7, 10.

U. S. Social Security Board: Compilation of the Social Security Laws (latest edition).

Williamson, W. R.: Social Budgeting. P.C.A.S. XXIV, 17.

(b) *Compulsory Automobile Insurance.*

Committee to Study Compensation for Automobile Accidents: Report to the Columbia University Council for Research in the Social Sciences.

Duke University, School of Law: Law and Contemporary Problems, Vol. III, No. 4, October 1936; Financial Protection for the Motor Accident Victim.

(c) *Health Insurance.*

Duke University, School of Law: Law and Contemporary Problems, Vol. VI, No. 4, Autumn 1939; Medical Care.

(d) *Old Age Pensions and Insurance.*

Duke University, School of Law: Law and Contemporary Problems, Vol. III, No. 2, April 1936; Old Age Security and the Welfare Titles of the Social Security Act.

Féraud, Lucien: Actuarial Technique and Financial Organization of Social Insurance (Introduction only). International Labour Office. Studies and Reports. Series M, No. 17.

Grant, Margaret: Old Age Security.

(e) *Unemployment Insurance.*

Department of Labor, State of New York: Economic Brief in Support of the New York Unemployment Insurance Law.

Feldman, H. and Smith, D. M.: The Case for Experience Rating in Unemployment Compensation and a Proposed Method.

Kidd, C. V. and Lester, R. A.: The Case Against Experience Rating in Unemployment Compensation.

Kulp, C. A.: Calculation of the Cost of Unemployment Benefits (With Particular Reference to Ohio and Pennsylvania). P.C.A.S. XIX, 268.

Royal (British) Commission on Unemployment Insurance: Final Report. Chapter 1.

U. S. Social Security Board: Comparison of State Unemployment Compensation Laws (latest edition).

Section 19. Advanced Problems in the Underwriting and Administration of Casualty Insurance.

It is strongly recommended that the candidate seek to acquire technical proficiency in the subjects covered under this section by direct discussion, whenever possible, with executives in the various departments of the casualty insurance business. In addition, the candidate should review scientific and professional journals and the proceedings of supervisory and administrative bodies or associations. Illustrative of these materials are the following:

International Association of Industrial Accident Boards and Commissions: Proceedings (annual). Published currently by the United States Department of Labor, Division of Labor Standards.

National Association of Insurance Commissioners: Proceedings.

State of New York, Superintendent of Insurance: Casualty, Surety and Miscellaneous Report. Part III (annual).

State of New York, Superintendent of Insurance: Preliminary Report (annual). (Materials on casualty and social insurance).

The candidate should keep in touch with current developments in casualty and related insurance lines by reading regularly the New York Journal of Commerce and also at least two general insurance periodicals.

The candidate should review all papers in the *Proceedings* of the Society for recent years which are not cited under the preceding sections. The papers included in the following references are indicated for particular attention:

Michelbacher, G. F. and Associates: Casualty Insurance Principles. Chapters 2, 3, 11, 14-18 and 20.

Hobbs, C. W.: Workmen's Compensation Insurance. Chapter 11.

Flynn, B. D.: Interest Earnings as a Factor in Casualty Insurance Rate Making. P.C.A.S. XIV, 285.

Tarbell, T. F.: Business Cycles and Casualty Insurance. P.C.A.S. XVIII, 253.

Tarbell, T. F.: The Effect of Changes in Values on Casualty Insurance. P.C.A.S. XIX, 1.

Dorweiler, Paul: Policy Limits in Casualty Insurance. P.C.A.S. XX, 1.

Cahill, J. M.: Product Public Liability Insurance. P.C.A.S. XXI, 26.

Report of the Committee on Bases of Exposure for Workmen's Compensation Insurance. P.C.A.S. XXI, 200.

Hobbs, C. W.: Federal Jurisdiction and the Compensation Acts. P.C.A.S. XXIII, 170.

Ainley, J. W.: Problems in Relation to Contractual Liability Insurance. P.C.A.S. XXV, 151.

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AUTHOR	TITLE	PUBLISHER
Best's Insurance News	*Fire and Casualty Edition* (monthly)	Alfred M. Best Co., New York
Blackall, J. C.	*Stocks and Bonds as Insurance Company Investments. Proceedings, National Association of Insurance Commissioners (1936)*	Obtainable from Secretary of Association
Central Statistical Board	*Statistical Services and Activities of the United States (1940)*	Division of Statistical Standards, Bureau of the Budget, Washington, D. C.
Committee to Study Compensation for Automobile Accidents	*Report to the Columbia University Council for Research in the Social Sciences (1932)* (out of print)	Press of International Printing Co., Philadelphia
Conyngton, T. and Bergh, L. O.	*Business Law (third revised edition 1935)*	The Ronald Press Co., New York
Crist, G. W., Jr.	*Corporate Suretyship (1939)*	McGraw-Hill Book Co., Inc., New York
Dowling, L. Wayland	*Mathematics of Life Insurance (1925)*	McGraw-Hill Book Co., Inc., New York
Duke University, School of Law	*Law and Contemporary Problems*	Duke University, School of Law, Durham, N. C.
Feldman, H. and Smith, D. M.	*The Case for Experience Rating in Unemployment Compensation and a Proposed Method (1939)*	Industrial Relations Counselors, New York
Féraud, Lucien	*Actuarial Technique and Financial Organization of Social Insurance. International Labour Office. Series M, No. 17*	International Labour Office, Washington, D. C.
Freeman, Harry	*Mathematics for Actuarial Students; Part II—Finite Differences, Probability and Elementary Statistics (1939)*	Cambridge University Press. (Obtainable from G. E. Stechert & Co., New York)
Grant, Margaret	*Old Age Security (1939)*	Social Science Research Council. Committee on Social Security. Washington, D. C.
Granville, W. A., Revised by Smith, P. F. and Longley, W. R.	*Elements of the Differential and Integral Calculus (1929)*	Ginn and Co., Boston

INDEX TO READINGS—*Continued*

AUTHOR	TITLE	PUBLISHER
Hall, H. S. and Knight, S. R.	*Higher Algebra (fourth edition 1891)*	The Macmillan Co., New York
Hobbs, C. W.	*Annual Report to the National Association of Insurance Commissioners Relative to the National Council on Compensation Insurance*	Obtainable from National Council on Compensation Insurance, New York
Hobbs, C. W.	*Workmen's Compensation Insurance (1939)*	McGraw-Hill Book Co., Inc., New York
Hull, R. S.	*Casualty Insurance Accounting (1930)*	The Ronald Press Co., New York
Jordan, D. F.	*Investments (third revised edition 1936)*	Prentice Hall, Inc., New York
Kester, R. B.	*Principles of Accounting* (1939)	The Ronald Press Co., New York
Kidd, C. V. and Lester, R. A.	*The Case Against Experience Rating in Unemployment Compensation (1939)*	Industrial Relations Counselors, New York
Kulp, C. A.	*Casualty Insurance (1928)*	The Ronald Press Co., New York
Menge, W. O. and Glover, J. W.	*An Introduction to the Mathematics of Life Insurance (1935)*	The Macmillan Co., New York
Michelbacher, G. F. and Associates	*Casualty Insurance Principles (1930)*	McGraw-Hill Book Co., Inc., New York
Moulton, H. G.	*Financial Organization and the Economic System (1938)*	McGraw-Hill Book Co., Inc., New York
National Association of Insurance Commissioners	*Proceedings*	Obtainable from Secretary of Association
New York Insurance Law. Baldwin, W. E. Edition	*1939, with subsequent amendments*	Banks Law Publishing Co., New York
New York Insurance Law	*1939, with subsequent amendments*	J. B. Lyon Co., Albany
Patterson, E. W.	*Essentials of Insurance Law (1935)*	McGraw-Hill Book Co., Inc., New York

INDEX TO READINGS—*Continued*

AUTHOR	TITLE	PUBLISHER
Richardson, C. H.	*An Introduction to Statistical Analysis (enlarged edition 1935)*	Harcourt, Brace & Co., New York
Rietz, H. L., Crathorne, A. R. and Rietz, J. C.	*Mathematics of Finance (revised edition 1932)*	Henry Holt & Co., New York
Royal (British) Commission on Unemployment Insurance	*Final Report (1932)*	Obtainable from British Library of Information, New York
Sawyer, E. W.	*Automobile Liability Insurance (1936)*	McGraw-Hill Book Co., Inc., New York
Schmeckebier, L. F.	*Statistical Work of the National Government (1925)*	The Johns Hopkins Press, Baltimore
Skinner, E. B.	*Mathematical Theory of Investment*	Ginn and Co., Boston
Stone, H. F.	*Law and Its Administration (1924)*	Columbia University Press, New York
U. S. Social Security Board	*Comparison of State Unemployment Compensation Laws (latest edition)*	U. S. Social Security Board, Washington, D. C.
U. S. Social Security Board	*Compilation of the Social Security Laws (latest edition)*	U. S. Social Security Board, Washington, D. C.
U. S. Social Security Board	*Social Security in America (1937)*	U. S. Social Security Board, Washington, D. C.
Whitworth, W. A.	*Choice and Chance*	G. E. Stechert & Co., New York
Willett, A. H.	*Economic Theory of Risk and Insurance (1901)*	Columbia University Press, New York