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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*.

“Thought is great and swift and free, the light of the world,
and the chief glory of man.”

—*Bertrand Russell.*

“Not to know what is necessary for mankind in general, and
what is the truth, is disgraceful to everyone; and yet to enter
into these matters minutely is neither easy, nor at all possible
for everyone.”

—*Plato.*

ERRATA

On page 345 After “Class D Credit” insert, $\frac{“V”}{2}$.

After “Class E Charge” insert, $\frac{“V”}{2}$.

After “Class F Charge” insert, “2V”.

PHOTOGRAPH OF THE MEMBERS

Twentieth Anniversary Dinner

November 22, 1934

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CASUALTY ACTUARIAL SOCIETY—TWENTIETH ANNIVERSARY DINNER—NOVEMBER 22, 1934

PROCEEDINGS

NOVEMBER 22, 1934

A SURVEY OF RISK CREDIBILITY IN EXPERIENCE
RATINGPRESIDENTIAL ADDRESS AT TWENTIETH ANNIVERSARY,
PAUL DORWEILER

Anniversaries suggest retrospection. While meditating on the Twentieth Anniversary of our Society, it seemed fitting to select a subject that is peculiar to casualty insurance, that has received serious attention and study from our members, and that has served as the instrumentality through which some real contributions have been made to that body of knowledge which we hope to enlarge and organize so that we may properly call it *Casualty Insurance Actuarial Science*.

A survey of the casualty insurance field will reveal many places where pioneering efforts have resulted in distinctive contributions. Among those of direct interest to actuaries may be cited the development of coverages and premium bases, the devising of statistical systems within the carriers, the organization of central bureaus and boards for collecting and compiling the carriers' data, the formulation of methods for reducing these data to uniform (basic) levels, and the development of weighting systems giving credibility on quantitative bases so that the actual experience of individual classifications and risks may receive proper recognition. Each of these might be a fitting subject for this anniversary occasion. I have selected the last because it is almost exclusively actuarial in nature, and because the largest and most distinctive contributions to casualty actuarial knowl-

edge have been made here. It is my intention to confine myself to a particular phase of the broader subject of the credibility of experience by limiting my remarks to the credibility of the experience of the individual risk while making a brief review of the development of credibility in experience rating in compensation insurance. I have selected the compensation field because experience rating was originally developed here and then adapted to other lines and because the only available data for checking results are found here. It is not my purpose to treat the principles and practices of experience rating at length. I intend merely to consider some developments of the past pertaining to the credibility of the individual risk experience and suggest some further studies.

A review of the *Proceedings* will reveal several thoughtful and forward-looking papers concerning experience rating of compensation insurance risks in the early volumes—see Bibliography, Appendix III. The resourcefulness of the writers, their comprehensive treatment of the problem, and their boldness in experiment merit admiration even when reviewed after the lapse of more than a decade and in the light of the information acquired during that time. After these pioneering efforts which shaped the general structure of the experience rating procedure, the subject fell into abeyance so far as our Society records reveal. There are only two papers* since Volume IV devoted wholly to a phase of experience rating. Special phases of experience rating have been treated forcefully in letters, memoranda, and discussions by members of various committees of rating organizations. It is hoped that some of the ideas developed may be added to the permanent records in our *Proceedings* and that interest in both the fundamentals and applications of experience rating may be revived.

DEFINITION AND OBJECT OF EXPERIENCE RATING

The term "experience rating" as now used refers to definitely prescribed procedures for determining individual risk rates depending in whole or in part on the risk's own experience. Risks whose rates have been determined in accordance with some such procedure are said to be experience rated. The compilation of

* Senior, Vol. XI; Kormes, Vol. XX.

definitions, rules, regulations, formulas, and forms necessary to describe and apply the procedure is called the *experience rating plan*.

The object of experience rating is to determine a more equitable rate for the individual risk based in a degree on the evidence presented by its own experience. It is recognized that individual risks within a classification are not alike and that there exist inherent differences due, for example in compensation, to variations in plants and premises, in operating processes, in the materials involved, in the management, in the morale of employees, in claim consciousness, and in the relation to the community. These differences are of such a nature that it is difficult to label them definitely and they cannot be associated with conditions measurable in advance. It is known, however, that variations in experience do exist in a way that definitely precludes ascribing all of them to chance. Experience rating is considered by many as the most practical method yet devised, or even suggested, of giving recognition to variations produced by such factors.

BASIS OF EXPERIENCE RATING

Experience rating is based on the existence of variations in the inherent hazard of the risks which enter into the classification experience. Its object is to measure to a higher degree the hazard of the individual risk by the evidential value of the risk's own experience. This basis needs to be emphasized. If all risks were entirely typical of the classifications, the variation in experience would be purely fortuitous and there would be no place for experience rating; for it would be impossible to reclassify the risks into more homogeneous groups. There are many factors which in different combinations enter into the risk's experience and affect the quality in different degrees. These, at least as yet, can not be classified and recognized so that they may be given individual consideration in rating. They may, however, be reflected to some extent by making use of the effect produced by them as shown in the experience. In the experience rating process, no distinction can be made between similar individual accidents which are fortuitous and those which are indicative of the actual conditions of the risk. The experience of the risk necessarily cannot be divided on such a basis.

APPLICABILITY OF EXPERIENCE RATING

Experience rating is applicable wherever there is a large variation among the risks which make up the classification and where the individual risks are of such nature that they may be expected to develop individual risk experiences of appreciable evidential value. Many lines of casualty insurance have classifications somewhat non-homogeneous, resulting largely from the meager experience available and the present lack of knowledge of the elements which enter into the composition of hazards. Considering only the qualification of having atypical risks within classifications, most casualty lines would be subject to experience rating. The further qualification of having individual risk experiences large enough to be of appreciable evidential value is more restrictive.

Compensation insurance, particularly, is subject to experience rating, for to a considerable degree the losses may be controlled and individuality of management reflected in the experience through the employer's ability to correct defective conditions and to enforce safe practices among employees by his potential power to dismiss or to withhold promotions. There are a few other lines, like employers' liability, workmen's collective, and automobile fleet collision, where the assured has similar power to affect losses. In third party insurance, the assured generally cannot control losses to the same degree, for, notwithstanding that the coverage is for liability of the assured only, the actions of the third party, over whom he has no control, affect the losses. In compensation insurance, risks develop individual risk experiences which in some cases have very high evidential value and, because of the control exerted by the management or other factors, often vary widely even within more homogeneous classifications, relative to occupations covered.

PROSPECTIVE AND RETROSPECTIVE RATING

An experience rating plan in which the experience of the risk is used to determine definite rates for periods in the future is said to be a *prospective* experience rating plan. All plans ever approved for general use have been of this form. A plan in which the experience of a given period is used to determine a final rate to apply to a past period is said to be a *retrospective* plan. Both

of these are entirely legitimate plans and represent definite ways of recognizing variations in the inherent hazards of risks. Both kinds could operate simultaneously, and under an economic system of unrestricted competition probably some carriers would select one form and some the other. The same carrier might even use both forms, applying to some risks one form, and to some the other, or it is even conceivable that both forms might be applied to the same risk. *Retrospective* rating would involve some change in theoretical viewpoint, for experience rating as now applied does not depart from the principle of a known rate fixed in advance.

ESSENTIALS OF EXPERIENCE RATING

The essential operation of experience rating consists of comparing the risk experience and classification experience on a common premium and loss basis, assigning to the risk experience a weight depending on the size of the risk premium and to the classification experience the complementary weight, and deriving a rate therefrom. The adjusted risk rate or experience rate may be looked upon as a weighted average of the rate indicated as necessary by the losses of the risk and the manual rate, that is, the rate indicated by the classification experience. The comparison may be made and has been made in different plans on the basis of indicated losses, pure premiums, or premiums.

In compensation insurance it is required first to "modify" the actual experience of the risk to bring it to the level of current industrial conditions as reflected in the current manual rate level. In the most widely used plan the procedure then is to determine "adjusted losses", the weighted average of the risk's modified losses and the "expected losses" which are indicated by the premium at manual rates*; to derive the ratio of the adjusted losses to the expected losses and apply this ratio to the manual rates* to obtain the final rates. In determining the adjusted losses, the hazard is divided into "normal losses" hazard and "excess losses" hazard. The weight or credibility assigned to the risk's experience is less in determining adjusted excess losses than in determining adjusted normal losses. The large losses occur less frequently than the normal losses and, costing much more individually, their volume in a given risk's experience is less indica-

* Schedule rates are used instead if schedule rating applies.

tive of the real hazard of large losses inherent in the risk than the volume of normal losses is of the real hazard of normal losses.

The technique of each step in the procedure, though worthy of detailed consideration and study, will not be considered here. It has been discussed at times in letters, memoranda, and open discourse in committees of rating bodies. The method of developing loss and payroll modification factors, the use of estimated individual case losses, average value losses whether fixed for all cases or varying with the duration of the case or other conditions, the theoretical and practical advantages and disadvantages of non-split, two-split, or multi-split plans; all these might well receive extended consideration. I propose to consider only risk experience credibility in casualty insurance experience rating, its development, and some criteria of proper credibility, after first mentioning the subject of off-balance produced by experience rating in total premiums because of its inter-relationship with credibility.

OFF-BALANCE OF PLAN.

A phase of the technique of experience rating which has assumed increasing importance is the off-balance of the experience rating plan, that is, the variation of the premium collected on experience rated risks under adjusted rates from that expected at manual rates. There are reasons why one might expect an experience rating plan in which credibility varies with size to be out of balance, when the same elements enter into the modification factors which enter into the manual rate determination. What used to be believed the preponderant, if not the sole cause, an under-reporting of losses on experience rated risks has, it now seems, been over-estimated as to its influence. At least the risk experience so far available from the rather recently established systems of individual risk reports to rating organizations indicate no greater development factor for losses of large risks than they do for losses of small risks which are not subject to experience rating. A factor which is coming more to be recognized as a primary cause of off-balance is the difference in the quality of the experience of large risks and small risks. Generally, the experience of the large risk is more favorable than that of the smaller risk, or of all risks. Necessarily, where the manual rate level is keyed

to the average of all risks and no allowance has been made for this more favorable experience for large risks, it may be expected that an off-balance will be produced from experience rating. Even if recognition is given in the rate level to the more favorable experience for experience rated risks and the experience rating plan keyed to the level of rated risks, there is still left the variation within the experience rated group between the extremely large risks and those risks which just qualify for experience rating. As will be noted from the experience shown for policy year 1931 for New York, Table I, the manual loss ratio for risks in excess of \$10,000 is more than 10% below the average of experience rated risks. These have more favorable experience and by virtue of their size under the experience rating plan receive larger credibility and therefore obtain credits which cannot be expected to be offset by an equal volume of less favorable experience on the smaller experience rated risks whose credibility is less.

DEVELOPMENT OF THE CREDIBILITY FACTOR IN COMPENSATION

National Workmen's Compensation Service Bureau Plans

The part of experience rating plans over which opinion has differed most concerns the reliance placed on the risk's own experience or what is now known as the credibility factor. In this outline of the development of credibility, only the plans of the National Workmen's Compensation Service Bureau and the National Council on Compensation Insurance will be reviewed. In the development of the general principles of experience rating, these may be considered representative. In the first compensation experience rating plans, of which Plan A of 1916 and Plan B of 1917 of the National Workmen's Compensation Service Bureau are typical, there was no general variation in credibility by size of risk. In Plan A there was a limited variation in credibility by size of risk for the schedule rated risks only. In Plan B there was a small variation in credibility by rate size groups but no variation by risk size. The extent of the modification of the risk depended on the amount by which the risk's loss ratio deviated from the average. Soon this failure adequately to consider the size of risk was generally recognized and dealt with in the credi-

bility formulas introduced with Plan D* in 1918. In this plan credibility was determined in two divisions of coverage, from the partial premium corresponding to the death and permanent total disability coverage, and the partial premium for all other coverage. The credibility for each part was obtained from formulas of the form

$$Z = \frac{P}{P + K}, \text{ where } Z \text{ denotes credibility}$$

P denotes partial premium
 K denotes a constant

The Z 's (Z_1 and Z_2 respectively) were taken from separate formulas or curves determined by K values (K_1 and K_2) chosen to give appropriate credibility to the losses in each division, the credibility being less for death and permanent total disability experience than for other losses of the same risks.

The formulas represent equilateral hyperbolas which pass through the origin and have as asymptote the line $Z = 1$. This permits one more point arbitrarily to be selected for each curve to determine the curve completely. Originally this point was selected for each division of coverage after experience rating a set of New York risks, both actual and hypothetical, using credibility curves of different degrees of liberality. The members of the committee, after consulting with underwriters, chose those curves which in their opinion produced the best results for the set of risks and thus established the constants K_1 and K_2 and the formulas for New York. The constants for other states were then selected so as to produce approximately the same credibility by parts if the accidents and claims of an average risk had been developed in New York and in each of the other states under their rates and compensation acts.

In determining credibility, the risk premium at latest manual rates was and still is used. This puts all risks on a common basis and eliminates differences that might affect credibility as between risks if actual premiums were used. Such differences might arise from different rate levels in the experience periods used or, and this is more important, from credits and debits in risks previously experienced rated, whereby risks of the same classification

* There was no Plan C for compensation; this letter was used for an employers liability plan.

and of the same size in number of employees and amount of payroll would have different credibility.

Industrial Experience Rating Plan—1920

The National Council's first plan, the Industrial Experience Rating Plan—1920 introduced some modifications in the technique of credibility determination. The credibility formula for death and permanent total disability remained as before, but for all other losses a new constant C was introduced to increase credibility, making the formula

$$Z_2 = \frac{P_2 + C}{P_2 + K_2 + C}$$

A refinement was introduced in the method of dividing the premium between the two coverages, making the division on the basis of the ratios of expected losses in the two divisions in each manual classification. Previously, the classifications had been grouped by size of rate, and average ratios determined, one for each size group. A new feature of the plan was the introduction of "self-rating". This provision was that risks whose subject* premium or whose indicated premium from the losses was \$80,000 or more should have a credibility of unity in each division of coverage. Interpreted graphically, this means that credibility for risks under \$80,000 premium was determined from the Z curves, and for risks of \$80,000 and over the credibility was taken from the line $Z = 1$.

Industrial Experience Rating Plan—1923

When the Industrial Experience Rating Plan—1923 was adopted, the losses were separated into "normal" and "excess" losses for determining credibility, in place of the former two divisions, "Death and Permanent Total", and "All Other" losses.

The credibility formulas were $Z_1 = \frac{P_1}{P_1 + K_1}$, $Z_2 = \frac{P_2}{P_2 + K_2}$, a return to the forms in Plan D. It was agreed to fix the Z curves for each state by selecting K 's so that a single maximum claim on a risk of \$1,000 subject premium having the average

* Subject premium is the premium subject to experience rating, and is obtained by extending the payrolls of the experience period at the manual or schedule modified rate for the effective date of the rating.

state excess ratio would increase the rate by 20% of the manual, 15% of the effect to be on the normal portion and 5% on the excess portion. The self-rating point was set at \$100,000 subject premium or \$60,000 losses for most states. A system of weights applying to both the actual and expected losses which decreased the influence of the older policy years was introduced toward the end of the effective period of this plan.

Industrial Experience Rating Plan—1928

The discontinuities of the credibility curves were removed in the Experience Rating Plan—1928. The formulas remained the same as in the Plan—1923, with K values determined by the same rule as before, but the range of applicability of the formulas was lessened and the discontinuities of the curves removed through the introduction of tangents to the curves from selected self-rating points. Separate normal and excess self-rating points were established. The self-rating point for normal experience was the same as before. Credibility for normal became unity at the point* corresponding to \$100,000 subject premium, and credibility for excess experience was lessened, becoming unity at the point* corresponding to \$200,000 subject premium. In this plan, which is still in effect, the credibility curves have become compound continuous curves, with the first sections arcs of hyperbolas, the second tangents to the hyperbolas, and the last a horizontal line. Tables have been constructed from which the credibility values are taken.

APPRAISING EXPERIENCE RATING

Underwriters and the assured are continually passing judgment on the results for individual risks. Little has been done, however, toward obtaining more systematic or statistical analyses of the results. Various possibilities occur as to the relation of the empirical Z values with what might be regarded as the proper values. The credibility may be everywhere either too high or too low, or it may be too high at one extreme or too low at the other, or the empirical curve may cross the proper value several times. Before commenting on the relation of the credibility

* On an average normal-excess premium split basis.

scale and the results of an experience rating plan, it is necessary to consider again what the experience rating plan is designed to do.

The object of experience rating is to make all experience rated risks within a classification having correct manual rates equally desirable as far as the loss ratio is concerned, or, if all classification rates are assumed correct in their net effect for the total of experience rated risks in the classification, it may be said the object is to make all experience rated risks equally desirable from the loss ratio point of view. In the discussion which follows it will be assumed that the classification rates are correct in their net effect for experience rated risks.

A necessary condition for proper credibility is that the credit risks and debit risks equally reproduce the permissible loss ratio. Also, if the proper credibility has been attained, each sub-group of the credit and debit risks, provided it has adequate volume, should give the permissible loss ratio. While these conditions are necessary for a proper credibility of the experience rating plan, it does not follow that they are also sufficient. For a sufficient condition it would be required to establish that the risks within a group cannot be subdivided on any experience basis so as to give different loss ratios for the subdivisions, assuming the latter have adequate volume.

The necessary and sufficient conditions for the achievement of ideal credibility in an experience rating plan may be illustrated by an analogy to the classification experience. A necessary condition for proper classification rates is that each classification shall reproduce the permissible loss ratio. This condition, however, is not sufficient. A sufficient condition further requires that any subdivision of the classification having adequate volume should reproduce the permissible loss ratio. If two classifications, each of which has its different proper rate, are combined and an average rate established for the combination, the new combined class would reproduce the permissible loss ratio provided the relative volumes in the two original classes remain the same. For this new class, the necessary condition that the new rate reproduce the permissible loss ratio, would have been met. The condition for sufficiency that each sub-group reproduce the permissible loss ratio on the new rate basis would not have been met, for if the new rate were applied to the exposure under each of the original

classifications which entered the combination, the permissible loss ratio would be reproduced for neither.

The necessary and sufficient condition for establishing that the credibility basis of the experience rating plan is correct may be stated as the condition that it is impossible to subdivide the risks on an experience basis differing from the experience rating plan and predict significantly different loss ratios for the subdivisions, providing they have adequate volume to be dependable. When considering the results of any plan, it is impossible to prove that the experience cannot be divided on any other credibility basis to yield better results. The second or sufficient condition is only required to prove that the plan in question is the optimum. The first condition is all that need be considered to test the relative merits of any given plans of experience rating or credibility scales or of a plan of experience rating as compared with no experience rating. The question then is not whether ultimate perfection has been reached but rather whether one plan is better than another, or than no experience rating.

The primary agents in the plan itself, other than the basic data, which affect the experience modification of a risk are the loss modification factors (including the effect of the average value and the payroll factor) and the credibility allowed the risk experience. It may be shown what effect each of these has when the other is assumed to be correct and to remain so. Consider the effect of variation in the loss modification factors on the risks of a premium size group arranged in experience modification groups, as in Table I. If the loss modification factor is too high (produces more modified losses than correspond to the rate level) and if the assumption is made that the rate level and the credibility factor are correct by premium size groups, it may be shown that the loss ratios produced in a given premium size group will have a downward trend as the experience modification increases. Conversely, if the modification factor is too low under the same conditions, the resulting loss ratios will have an upward trend. (See Appendix I.)

TEST OF CREDIBILITY SCALE

In Appendix II the compensation experience of experience rated risks in New York for policy year 1931 has been compiled

in a manner to permit examining the results of the New York Plan in relation to the necessary condition for proper credibility. The risks have been sorted in Table I into premium size groups and then each of these groups has been sorted into experience modification groups of .10 intervals. The sub-groups of the experience rating data resulting from these two sortings will be called "parcels".

It will be noted from Table I and the summary on page 19 that, for the individual parcel, the actual loss ratio is nearer to the permissible loss ratio (.605) than the manual loss ratio is, in 74 of the 97 parcels. For the parcels having credit experience modifications the actual loss ratio is nearer in 45 out of 52, and for the parcels having charge modifications the actual loss ratio is nearer in 29 out of 45.

When the credit parcels within each premium size group are combined, 7 of the 8 combinations show less deviation from the permissible loss ratio for the actual than for the manual loss ratio, the exception being the combined credit parcel for the short-term risks. The same result prevails when all the parcels within a premium size group are combined. When the parcels for the debit experience modifications are combined, 5 of the 8 combinations show less deviation from the permissible loss ratio for the actual than for the manual loss ratio.

When one considers the trends of the straight lines fitted by least squares to the actual loss ratios of the individual premium size groups, it will be noted, page 20, that, in passing from the lower to the higher modifications, of the 8 lines fitted to the credit parcels, 4 have an upward trend and 4 have a downward trend. In the lines fitted to the loss ratios of the debit parcels, the trend in 5 is upward and in 3 downward. When the lines fitted to the loss ratios of all parcels are considered, 6 have upward trends and 2 downward trends.

Interpreting these trend results on the assumption that the loss modifications factors are correct it may be said that they are not unfavorable to the present credibility or "swing" of the plan. It could hardly be expected in view of the limited data that no trends would appear—a condition that would uphold the present credibility. The indicated trends are rather evenly divided between upward and downward trends in the credit and charge experience modification groups. For all groups combined,

which should be the most reliable, the upward trend dominates which would indicate that the present credibility was too restricted. However, when the short-term risks are eliminated, the trend is downward. Too much credence should not be given to the indications, for the data are not only limited but are derived from a single policy year situated in a particular phase of the business cycle. Similar tests should be applied to other policy years in other phases of the cycle and to other experience rating plans, and the results studied before passing final judgment.

I have attempted in these remarks to direct your attention to a problem that is of primary importance in casualty insurance with the hope of stimulating your thought and interest rather than presenting a solution. Compensation insurance was selected for purpose of illustration because the line is well-known; experience rating has been most highly developed in this line, and more extensive data are available for experimental purposes. The interest in the subject should extend to all lines where experience rating is applicable and experience available.

No attempt has been made to give a complete interpretation of the experience presented; this would be hardly justifiable on the basis of one year's experience. The object has been to indicate ways in which tests might be conducted. If a number of our members, either individually or jointly, undertook to analyze the data of experience rated risks for different states and policy periods, possibly along the lines suggested, it is my belief that there would result contributions to both the fundamental principles and applications of experience rating, perhaps comparable to those made in the first decade of our Society.

APPENDIX I

EFFECT OF ERROR IN LOSS MODIFICATION FACTOR

Let the experience of the experience rated risks for a policy year in a given state be sorted into risk premium size groups and effective experience rating modification size groups. Designate these resulting sub-divisions of the experience as "parcels". Assume that the classification factor rates are correct and that the credibility of the experience rating plan is correct, so that with correct loss modification factors the actual loss ratios for each parcel will be the permissible.

It is proposed to determine the effect produced by an error in the loss modification factor on the trend of the actual loss ratios of the parcels in a given risk premium size group when the parcels are arrayed in increasing experience modification order. The loss modification factor herein will be understood to embrace the combined effect of the present modification factors for losses and payrolls and the effect of using average values. The modification factor will be considered correct when the losses of a given year are brought to the loss level underlying the manual rates.

Let F denote correct loss modification factor

F' denote actual loss modification factor

L_s denote actual losses of the experience period of parcel s

P_s denote subject premium of parcel s

E denote expected loss ratio

M_s denote correct experience modification of the risks in parcel s
(derived by using the correct modification factor F)

M'_s denote actual experience modification
(derived by using the actual modification factor F')

Z denote credibility of risks in premium size group

x denote difference between F' and F , or correction in F'

Then

$$F' = F + x$$

EP_s = expected losses of parcel s

FL_s = modified losses of parcel s , using correct loss modification factor

$(F + x)L_s$ = modified losses of parcel s , using actual loss modification factor

$$M_s = \frac{ZFL_s + EP_s(1-Z)}{EP_s}$$

$$M'_s = \frac{Z(F+x)L_s + EP_s(1-Z)}{EP_s}$$

$$= M_s + \frac{ZxL_s}{EP_s}$$

Consider the loss ratio of the experience developed in parcel s during the effective periods of the ratings based on F'

- ${}_fL_s$ denotes actual losses in parcel s during effective (future) period
- ${}_fP_s$ denotes manual premium in parcel s during effective (future) period
- ${}_f r_s$ denote loss ratio of parcel s during effective (future) period with ratings based on F
- ${}_f r'_s$ denote loss ratio of parcel s during effective (future) period with ratings based on F'

Then

$$\begin{aligned} {}_f r'_s &= \frac{{}_fL_s}{{}_fP_s M'_s} = \frac{{}_fL_s}{{}_fP_s \left(M_s + \frac{Z x L_s}{EP_s} \right)} \\ &= \frac{{}_fL_s}{{}_fP_s M_s} \cdot \frac{1}{1 + \frac{Z x L_s}{EP_s M_s}} \\ &= \frac{{}_fL_s}{{}_fP_s M_s} \frac{1}{1 + \frac{Z x L_s}{ZFL_s + EP_s(1-Z)}}, \text{ since } EP_s M_s = ZFL_s + EP_s(1-Z) \\ &= {}_f r_s \cdot \frac{1}{1 + \frac{x}{F + \frac{EP_s}{L_s} \cdot \frac{1-Z}{Z}}}, \text{ where } {}_f r_s, x, F, \text{ and } \frac{1-Z}{Z} \text{ are constant} \\ &\hspace{15em} \text{and } 0 < Z < 1 \end{aligned}$$

As M_s increases these relations hold

	Case I	Case II
	$x > 0$	$x < 0$
$\frac{{}^*EP_s}{L_s}$	decreases	decreases
$\frac{EP_s}{L_s} \cdot \frac{1-Z}{Z}$	decreases	decreases
$F + \frac{EP_s}{L_s} \cdot \frac{1-Z}{Z}$	decreases	decreases
$\frac{x}{F + \frac{EP_s}{L_s} \cdot \frac{1-Z}{Z}}$	increases	decreases

$$1 + \frac{x}{F + \frac{EP_s}{L_s} \cdot \frac{1-Z}{Z}} \text{ increases} \qquad \text{decreases}$$

$$\frac{1}{1 + \frac{x}{F + \frac{EP_s}{L_s} \cdot \frac{1-Z}{Z}}} \text{ decreases} \qquad \text{increases}$$

$$r'_s \text{ decreases} \qquad \text{increases}$$

This shows that if the actual modification factors are greater than the correct modification factors there will result a downward trend in the loss ratios and if the actual factors are less than the correct factors there will result an upward trend in the loss ratios, assuming that the rest of the experience rating plan is correct.

$\frac{*EP_s}{L_s}$ is independent of x and decreases with an increase in M_s

as the parcels are assumed to be arrayed in that order.

APPENDIX II

RESULTS OF NEW YORK PLAN

Table I is an exhibit showing data of experience rated risks in New York for policy year 1931 compiled by the Compensation Insurance Rating Board of New York. In this exhibit the risks have been separated into full term and short term risks. The full term risks have been further separated into seven premium size groups based on actual annual premiums. The short term risks have been shown separately as it was impracticable to make a size division on an annual premium basis. There is also one group for all full term risks combined and another group for the total of all risks. The risks within each premium size group have been divided according to the experience rating modification factor underlying the risk rate in effect for policy year 1931.

A separation into size groups on the basis of manual rate annual premiums would have been preferable as reflecting more nearly the relative size of exposure. To place the experience on this basis, however, would require the determination of the manual premium for individual risks. The manual loss ratios given were derived by the Compensation Insurance Rating Board from manual premiums calculated for groups of risks at intervals of .01 of experience modification by division of the group actual premiums by their experience rating modifications.

For each experience modification division in each of the premium size groups there are shown the number of risks, the actual premiums expressed in \$1,000 units, the actual loss ratio, and the manual loss ratio. The totals of these items for all credit risks, all charge risks and all risks are also shown. The object is to test the effect of experience rating on the loss ratios of the individual parcels into which the policy year experience has been sorted by the division into premium size groups and experience modification groups. If the experience rating procedure produces rates more equitable than the manual rates which they supersede, then, assuming adequate exposure, the deviations from the permissible loss ratio should be less for the actual loss ratios than for the manual loss ratios of the individual parcels.

In Table IA for each experience modification group a "1" has been placed in the proper column and line for each parcel to indicate whether the actual loss ratio or the manual loss ratio was nearer to 60.5%, the permissible loss ratio. The columns also have been summed for all credit modification groups, all charge modification groups, and all modification groups. At the bottom of Table IA, on the last three lines, it has been indicated in a similar manner whether the actual loss ratio or the manual loss ratio was nearer the permissible for all credit risks combined, for all charge risks combined, and for all experience rated risks combined. The results for the individual parcels of premium size groups and the whole premium size groups in Table IA when summarized are as follows:

Experience Modification Group	Number of Parcels where the Permissible Loss Ratios are nearer to		Number of Premium Size Groups where the Permissible Loss Ratios are nearer to	
	Actual L. R.	Manual L. R.	Actual L. R.	Manual L. R.
Credit Groups	45	7	7	1
Charge Groups	29	16	5	3
All Groups	74	23	7	1

In these tabulations the short-term risks were considered as one premium size group. This short-term group is responsible for the entries in the first and last line of the last column denoting that the permissible loss ratio is nearer to the manual than to the actual.

If the manual rates for the classifications were quite correct for every premium size group, if the experience rating plan were perfect, and if the volume of experience under each partition were adequate, the actual loss ratio in each partition should equal the permissible. Under these ideal conditions the deviations from the permissible loss ratio would be purely fortuitous and be plus and minus with equal frequency. Then straight lines fitted by least squares to the actual loss ratios of the parcels in any direction should have no trend, and a plane fitted to the whole field should be level.

In Table IB are shown loss ratios lying on straight lines fitted to the actual loss ratios of experience modification groups of each premium size group in Table I by the method of least squares, using the actual premiums in thousands as weights. In the column headed "All", the loss ratios derived from the fitted straight lines are given. In the other columns, under "Cr", the loss ratios on straight lines fitted to the credit modification groups only are given, and, under "Dr", the loss ratios on straight lines fitted to the charge modification groups only are given.

An effort has been made to gain in this way some knowledge as to the effect of the credibility factor or the "swing" of the plan. If all the conditions were correct, a line showing an upward trend in loss ratios with increasing experience modification groups would indicate that the swing of the plan is too restricted, for a wider swing would increase the credits and charges which would result in higher loss ratios for credit risks and lower loss ratios for charge risks. The change, if sufficient, could be made to overcome the trend so that, generally, the actual loss ratios for the charge risks would be no higher than those for credit risks.

It will be observed from Table I, that for all premium size groups, except the highest two, the actual loss ratios for the charge risks exceed those of the credit risks. In the "\$10,000-\$49,999" premium size group, the predicted charge risks had a manual loss ratio of 58.9% as compared with 48.8% for the whole group. The application of the charges from experience rating produced an actual loss ratio for this group of 50.2% as compared with 54.7% for the whole premium size group. If these limited data were accepted as fully reliable, this would indicate a swing which is too large, or a credibility factor which is too

high, in the experience rating plan. In the "\$50,000 up" premium size group, the debit risks are even more out of line. The predicted debit risks actually have a trifle better manual loss ratio than the group as a whole and, with the charges imposed, the actual loss ratio becomes very much better than that of the whole group.

The results, aside from these two high groups, are rather favorable to the present credibility of the experience rating plan. It is possible that the self-rating points established arbitrarily may have an influence on these large premium size groups. However, the complete reversal of form of the eleven predicted charge risks in the highest group, assuming they were correctly reported and rated, cannot be explained by any change in credibility factor. The actual explanation would require a detailed examination of the underlying losses which enter into the rating procedure and the conditions prevailing in the risks during policy year 1931 and the preceding years when the experience underlying the experience rating procedure was developed.

In Table IB, the loss ratios on straight lines fitted to the data in Table I show trends as the experience modification increases. These trends for the loss ratios on the lines fitted to the credit groups, the lines fitted to the charge groups, and to all groups for the seven full term premium groups, and the one group including all short-term risks combined, may be summarized as follows:

Experience Modification Groups	Straight Line Loss Ratio Trends as Experience Modification Increases	
	Trend Upward	Trend Downward
Credit Groups	4	4
Charge Groups	5	3
All Groups	6	2

The results for the credit groups are evenly divided between upward and downward trends. The results for the charge groups and all groups show an upward trend, though not a very decisive one.

TABLE 1—COMPARISON OF ACTUAL LOSS RATIOS AND MANUAL LOSS RATIOS
EXPERIENCE RATED COMPENSATION RISKS IN NEW YORK POLICY YEAR 1931
DATA OF COMPENSATION INSURANCE RATING BOARD

Risks Grouped According to Size of Experience Modification: Full Term Risks Subdivided into Premium Size Groups

Experience Modification in Per Cent	No. of Risks	Act. Prem. in Thou.	Act. L. R.	Man. L. R.	No. of Risks	Act. Prem. in Thou.	Act. L. R.	Man. L. R.	No. of Risks	Act. Prem. in Thou.	Act. L. R.	Man. L. R.	No. of Risks	Act. Prem. in Thou.	Act. L. R.	Man. L. R.	No. of Risks	Act. Prem. in Thou.	Act. L. R.	Man. L. R.	
	UNDER \$500				\$500—999				\$1,000—2,499				\$2,500—4,999				\$5,000—9,999				
0-30%
30-39
40-49	5	2	31.3	14.4	2	2	364.1	132.7	6	11	14.0	6.7	6	22	58.6	26.4	2	17	90.6	29.7	
50-59	16	2	165.3	91.9	4	3	28.3	13.1	22	35	59.9	33.0	18	66	48.4	26.5	2	15	23.6	10.8	
60-69	52	12	32.8	21.6	9	7	48.4	26.3	102	171	49.9	32.7	62	217	60.7	39.7	14	96	36.9	20.7	
70-79	211	58	82.6	62.5	34	26	43.6	28.4	273	432	46.6	35.2	139	474	50.4	37.9	30	225	66.7	43.4	
80-89	1,018	298	54.1	46.8	196	147	48.3	38.0	776	1,161	51.9	44.5	237	796	61.5	52.2	58	384	62.5	47.0	
90-100	3,524	1,090	53.8	50.6	973	708	45.3	38.8	893	1,345	57.2	53.5	243	806	50.1	47.0	97	671	55.7	47.2	
Credits	4,826	1,462	55.0	50.0	1,939	1,316	55.9	52.6	2,072	3,155	53.3	45.6	705	2,381	55.0	44.8	112	797	50.5	47.6	
100-109	1,003	305	66.8	69.3	3,157	2,209	51.9	46.4	2,072	3,155	53.3	45.6	705	2,381	55.0	44.8	315	2,205	55.4	44.4	
110-119	426	129	54.1	61.6	832	591	62.5	64.8	609	943	51.7	53.9	173	591	66.6	69.4	77	515	55.4	58.1	
120-129	171	51	66.3	82.4	416	296	65.6	74.9	371	570	55.5	63.3	113	398	56.2	64.1	48	342	60.6	69.0	
130-139	67	20	117.8	156.8	177	126	59.4	73.6	169	272	57.6	71.3	79	276	50.6	62.8	38	266	85.1	106.4	
140-149	35	11	42.8	60.4	85	59	52.2	69.9	92	147	67.7	90.2	41	150	88.4	118.7	34	232	59.6	80.0	
150 Up	27	7	48.3	76.6	36	25	71.1	102.5	52	81	58.3	82.7	27	92	59.2	85.2	13	84	38.4	55.1	
Charges	1,729	523	64.8	71.3	1,574	1,117	63.9	71.1	1,350	2,112	54.4	62.1	457	1,587	61.6	71.7	227	1,553	60.8	72.5	
TOTAL	6,555	1,985	57.6	54.9	4,731	3,326	56.0	53.5	3,422	5,267	53.8	51.1	1,162	3,968	57.7	53.2	542	3,758	57.6	53.4	
	\$10,000—49,999				\$50,000 and Over				Full Term—All Sizes				Short Term—All Sizes				All Risks				
0-30%	1	50	120.1	34.9	.....	.....	.....	.....	1	50	120.1	34.9	.....	.....	.....	.....	1	50	120.1	34.9
30-39	2	34	35.6	11.8	.....	.....	.....	.....	6	53	62.5	20.6	.....	.....	.....	.....	8	57	58.7	19.5
40-49	4	102	79.7	36.2	.....	.....	.....	.....	27	155	65.0	29.6	.....	.....	.....	.....	28	161	65.4	29.7
50-59	6	169	77.7	42.5	.....	.....	.....	.....	86	450	54.8	30.2	.....	.....	.....	.....	102	469	52.9	29.1
60-69	17	322	50.7	33.1	1	75	25.9	14.2	302	1,413	57.0	36.8	.....	.....	.....	.....	355	1,462	58.7	37.9
70-79	41	749	52.6	39.6	5	440	59.1	36.9	920	2,385	53.9	40.7	.....	.....	.....	.....	1,084	2,530	54.4	41.0
80-89	69	1,389	57.8	49.3	2	141	66.6	49.2	3,177	5,643	53.9	46.0	.....	.....	.....	.....	3,628	6,025	56.2	47.8
90-100	55	895	56.7	53.2	7	620	47.2	39.4	6,772	6,909	54.8	51.5	.....	.....	.....	.....	7,736	7,484	55.9	52.6
Credits	195	3,710	58.1	44.1	21	1,938	54.0	42.3	11,291	17,959	54.9	45.0	1,651	1,180	75.8	64.4	12,942	18,238	56.2	46.2	
100-109	58	1,073	47.7	49.6	4	371	38.0	40.6	2,756	4,389	54.5	56.9	451	281	84.7	88.8	3,207	4,670	56.4	58.8	
110-119	36	625	48.1	54.9	4	288	41.1	46.4	1,414	2,648	53.9	61.5	304	343	72.0	82.4	1,718	2,991	56.1	63.9	
120-129	15	292	60.9	76.6	3	192	30.1	36.9	652	1,475	58.7	73.1	211	210	88.1	109.6	863	1,685	62.4	77.7	
130-139	15	226	56.3	75.4	.....	.....	.....	.....	334	434	68.1	88.6	85	72	110.6	148.9	419	906	69.8	93.5
140-149	10	206	60.3	86.0	.....	.....	.....	.....	173	499	56.2	80.4	51	74	63.7	91.4	224	573	57.2	81.8
150 Up	13	248	39.5	66.2	.....	.....	.....	.....	166	568	45.6	76.5	78	116	83.5	133.2	244	684	52.0	86.5
Charges	147	2,670	50.2	58.9	11	851	37.3	41.8	5,495	10,412	55.5	64.1	1,180	1,096	81.6	97.7	6,675	11,509	57.9	67.1	
TOTAL	342	6,380	54.7	48.8	32	2,787	48.9	42.2	16,786	27,471	55.2	50.7	2,831	2,276	78.6	77.6	19,617	29,747	57.0	52.6	

TABLE IA—FROM DATA OF TABLE I
 COMPARISON OF ACTUAL LOSS RATIOS (ALR) AND MANUAL LOSS RATIOS (MLR)
 OF TABLE I WITH PERMISSIBLE LOSS RATIOS

A "1" in Columns "ALR" or "MLR" Indicates Respectively whether the Actual Loss Ratio or the Manual Loss Ratio is nearer to the Permissible Loss Ratio

Experience Modification in Per Cent	FULL TERM RISKS—PREMIUM SIZE GROUPS																All Short Term Risks		All Risks		
	Under \$500		\$500-999		\$1,000-2,499		\$2,500-4,999		\$5,000-9,999		\$10,000-49,999		\$50,000 and Over		All Groups		ALR	MLR	ALR	MLR	
	ALR	MLR	ALR	MLR	ALR	MLR	ALR	MLR	ALR	MLR	ALR	MLR	ALR	MLR	ALR	MLR					
0-30%	..	..	..	1	..	..	..	..	1	..	..	1	..	..	1	1	..	..	..	1	1
30-39	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
40-49	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	1	..
50-59	..	1	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	1	..
60-69	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	1	..
70-79	..	1	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	1	..
80-89	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	1	..
90-100	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	1	..
Credits	4	2	6	1	6	..	6	..	7	..	7	1	5	..	7	1	4	3	7	1	..
100-109	1	..	1	..	..	1	1	..	1	..	1	..	1	..	1	..	1	..	1	1	..
110-119	..	1	1	..	..	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	1
120-129	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	1	..
130-139	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	1	..
140-149	..	1	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	1	..
150 Up.	1	..	1	..	..	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	..
Charges	4	2	6	..	3	3	3	3	4	2	3	3	..	3	4	2	6	..	4	2	..
TOTAL	8	4	12	1	9	3	9	3	11	2	10	4	5	3	11	3	10	3	11	3	..
Credit Group	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	..	..	1	1	1	..
Charge Group	1	..	1	..	..	1	1	..	1	..	..	1	..	1	..	1	1	..	1	..	..
All Risks	1	..	1	..	1	..	1	..	1	..	1	..	1	..	1	..	..	1	1	1	..

TABLE IB—FROM DATA OF TABLE I
SHOWING TRENDS OF LOSS RATIOS WITH RISKS GROUPED BY SIZE OF EXPERIENCE MODIFICATION
WITHIN PREMIUM SIZE GROUPS

The Values given lie on Straight Lines Fitted by Least Squares to the Actual Loss Ratios in Table I,
 Weighted according to Actual Premiums

In the Columns headed "All" the Lines were Fitted to the Loss Ratios of All Modification Groups. In the Other
 Columns, under "Cr." the Lines were fitted to the Credit Modification Groups only, and under "Dr." to the
 Charge Modification Groups

Experience Modification in Per Cent	FULL TERM RISKS—PREMIUM SIZE GROUPS																All Short Term Risks		All Risks		
	Under \$500		\$500-999		\$1,000-2,499		\$2,500-4,999		\$5,000-9,999		\$10,000-49,999		\$50,000 and Over		All Groups						
	Cr.	All	Cr.	All	Cr.	All	Cr.	All	Cr.	All	Cr.	All	Cr.	All	Cr.	All	Cr.	All			
	0-30%	....	....	....	....	....	....	....	....	....	77.0	67.2	....	....	62.6	56.2	....	....	62.2	56.2
30-39	....	....	....	....	....	....	....	....	....	73.5	65.2	....	....	61.3	56.0	....	....	61.2	56.5	
40-49	77.9	48.0	37.2	28.9	33.2	38.2	48.9	59.0	54.1	64.5	56.0	70.1	63.8	....	60.0	55.9	74.4	71.7	60.2	56.7
50-59	73.0	49.8	42.6	37.6	41.9	49.8	58.0	54.8	62.1	56.3	66.6	62.0	52.3	49.1	58.7	55.7	74.7	72.8	59.2	56.9	
60-69	68.1	51.6	45.3	41.9	45.5	50.7	56.9	55.4	59.7	56.6	63.2	60.3	53.0	48.8	57.4	55.6	75.0	74.0	58.2	57.1	
70-79	63.2	53.5	48.0	46.2	49.1	51.6	55.9	56.1	57.3	57.0	59.8	58.6	53.6	48.4	56.1	55.4	75.3	75.1	57.2	57.4	
80-89	58.3	55.3	50.8	50.5	52.8	52.5	54.8	56.8	54.9	57.3	56.3	56.8	54.3	48.1	54.8	55.3	75.7	76.3	56.2	57.6	
90-100	53.4	57.2	53.5	54.8	56.8	53.4	53.7	57.4	52.6	57.6	52.9	55.1	54.9	47.8	53.5	55.1	76.0	77.5	55.2	57.8	
100-109	Dr.	59.0	Dr.	59.2	Dr.	54.3	Dr.	63.9	Dr.	57.9	Dr.	49.9	Dr.	47.5	Dr.	55.0	Dr.	80.6	Dr.	57.4	58.1
110-119	64.5	60.8	64.5	63.5	64.4	55.2	62.2	58.8	61.5	58.2	50.1	51.7	36.6	47.1	55.5	54.8	81.2	79.8	57.9	58.3	
120-129	65.3	62.7	65.2	67.8	54.9	56.1	60.6	59.4	60.7	58.6	50.3	49.9	33.5	46.8	55.5	54.7	81.7	80.9	58.4	58.5	
130-139	65.8	64.5	72.0	72.1	55.5	57.0	57.0	60.1	59.8	58.9	50.4	48.2	....	....	55.5	54.5	82.2	82.1	58.8	58.8
140-149	66.2	66.4	75.8	76.4	56.0	57.9	57.4	60.8	58.9	59.2	50.6	46.5	....	....	55.4	54.4	82.7	83.3	59.3	59.0
150 Up	67.0	70.0	83.4	85.1	57.1	59.7	54.2	62.1	57.2	59.8	50.9	43.0	55.4	54.0	83.8	85.6	60.2	59.4	

APPENDIX III

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PRODUCT PUBLIC LIABILITY INSURANCE

BY

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The casualty insurance companies have suffered severely from the decrease in premium volume which has been a natural consequence of the depression. The Casualty Experience Exhibit shows that for all stock companies entered in New York the country-wide volume of earned premiums in calendar year 1933 was approximately 26% less than the peak volume attained in calendar year 1930. The effort to regain casualty premium volume seems to be concentrated in using greater sales pressure on the favored lines such as Accident, Auto Liability, Burglary, and the more common forms of Liability lines, other than Automobile. From the standpoint of the possibility of developing a material increase in premium volume, no consideration appears to have been given to a line which has shown a steady increase in premium volume, even during the depression, ever since it was inaugurated. This line is Product Public Liability insurance, the rates for which were first shown in the manual effective July 1, 1925. The steady increase in the volume of business developed under this line during the last ten years is shown by the following exhibit:

EXHIBIT I

STOCK COMPANIES' PRODUCT PUBLIC LIABILITY EXPERIENCE

Policy Year*	Earned Premium	Incurring Losses (Incl. Allocated Claim Adjustment Expense)	Loss Ratio
1924	\$ 115,500	\$ 46,607	40%
1925	224,325	94,016	42
1926	392,895	143,285	36
1927	441,996	180,747	41
1928	566,103	180,043	32
1929	672,721	295,012	44
1930	676,633	379,968	56
1931	771,053	525,230	68
Calendar Year**			
1932	822,031	563,573	69
1933	1,010,355	763,345	76

Permissible Loss Ratio = 51%

* Data compiled by National Bureau of Casualty and Surety Underwriters from classification experience reports of stock companies.

** Taken from Exhibit 21 of the Supplement to the New York Casualty Experience Exhibit.

The trend of the loss ratios will largely explain why no effort has been made to develop this comparatively new line. This phase will be discussed more fully in a later section of this paper.

Product Public Liability is a line of insurance which does not stand in good favor with the insurance companies at the present time. The agency forces have been led to believe that the writing of this business should be discouraged and that no attempt should be made to solicit this form of coverage. As a result, most of the business written has been coverage for the sale of foods, cosmetics, or manufactured articles on which retailers have demanded insurance protection from the manufacturer. The result of this underwriting practice has undoubtedly been to produce a very adverse selection of business against the insurance companies.

In view of the increase in premium volume which has resulted in spite of the restrictive attitude of the insurance companies, it is apparent that if an attempt were made to develop the line there would be great possibilities for premium expansion and, incidentally, better selection of business. As a matter of fact, whether the companies desire an increase in Product Public Liability premium volume or not, it is certain that the volume will increase substantially in the future because of the great need of manufacturers, distributors, and retailers for this coverage. Although the annual premium volume is now only approximately \$1,000,000, it is likely that this line will become in the course of the next few years one of the most important under Liability lines, other than Automobile. With increasing frequency, it is becoming the policy of chain stores, department stores, wholesale associations, etc., to require that manufacturers furnish them with "hold harmless" agreements. The writing of this coverage on a contractual liability basis is a distortion which should be corrected, since this coverage should properly be provided through Product Public Liability policies.

GROWING NEED FOR PRODUCT PUBLIC LIABILITY COVERAGE

The need of manufacturers and dealers for Product Public Liability coverage is a fairly recent development. Previously, the spirit of the law was opposed to the imposition of liability which might tend to handicap the expansion of business. In

dealing with the problem, the courts have reflected the attitude of their times and the result has been a changing body of law, with the trend at present towards greater liberality.

Under common law, there are three legal theories available for the protection of the consumer. First, the seller can be held liable because he contracted to supply a good article (either on an express warranty or an implied warranty of fitness or merchantability) and broke his contract. Second, the party responsible for the defect or impurity can be held for negligence in permitting or causing its existence, where this negligence was the proximate cause of the injury. Third, if the consumer can prove that the dealer knew of the defect or impurity, the dealer can be held liable in a tort action for deceit.

The common law rules governing warranty have been codified by the Uniform Sales Act which is in force in about thirty states. This Act provides that (1) where the buyer expressly, or by implication, makes known to the seller that he relies on his skill and judgment in the purchase of goods for a particular purpose, there is an implied warranty of fitness for that purpose, and (2) where the buyer purchases from the dealer by description, there is an implied warranty of merchantability. The Act further provides for the implication of these warranties regardless of whether the seller is a dealer instead of a grower or a manufacturer. If a dealer is held liable for damages to an injured consumer, he may be able to recover from the grower or the manufacturer on the basis of either implied or express warranty according to their contract or on the basis of negligence. Claims involving negligence on the part of a manufacturer are usually handled directly by the latter for his ultimate protection.

It follows that if an injured consumer can prove a breach of warranty, either express or implied, on the part of the seller, he may recover to the extent of the damage suffered. Theoretically, there must be privity of contract between the purchaser and the warrantor in order to provide the basis for recovery. It should be mentioned, however, that the common law regarding warranties is being broadened by current decisions. Decisions in 1932 against prominent manufacturers held that such manufacturers were liable to the final purchaser, despite the privity of contract rule, on the basis of advertisements which were construed to be

warranties.⁽¹⁾ Also, in 1928, a consumer was successful in a suit against a manufacturer on the basis that the manufacturer's implied warranty to the dealer was a contract on which the consumer could sue as a third party beneficiary.⁽²⁾

It should be pointed out that, generally, neither the benefit nor the burden of the warranty "runs with the goods", but that it benefits only the purchaser, although others may be injured by the same unwholesome food or defective article. Lack of privity of contract prevents a recovery by the others.⁽³⁾

Written guarantees, labels, etc., are express warranties. In addition, there is a tendency to construe advertisements to be express warranties where radio, billboards, printed matter, etc., are used to create a demand for goods by representing that they possess certain qualities. The definition of an express warranty which is contained in the Uniform Sales Act is as follows:

"Any affirmation of fact or any promise by the seller relating to the goods is an express warranty if the natural tendency of such affirmation or promise is to induce the buyer to purchase the goods, and if the buyer purchases the goods relying thereon. No affirmation of the value of the goods, nor any statement purporting to be a statement of the seller's opinion only shall be construed as a warranty."

It will be observed that it is not material whether it is the intent of the seller to warrant. A positive representation of fact is enough to render him liable. The rule seems to be that those statements of fact concerning his product contained in a manufacturer's advertisements are express warranties as regards a

(1) *Baxter v. Ford Motor Co.*, 168 Wash. 456, 12 P. (2d) 409 (1932). The court said, "Since the rule of caveat emptor was first formulated, vast changes have taken place in economic structures of the English speaking peoples. Methods of doing business have undergone a great transition. Radio, billboards and the products of the printing press have become the means of creating a large part of the demand that causes goods to depart from factories to the ultimate consumer. It would be unjust to recognize a rule that would permit manufacturers to create a demand for their products by representing that they possess qualities which they, in fact, do not possess, and then, because there is no privity of contract existing between the consumer and manufacturer, deny that consumer the right to recover if damage results from the absence of those qualities, when such absence is not readily noticeable." *Curtis Candy Co. v. Johnson*, 163 Miss. 426, 141 So. 762 (1932).

(2) *Ward Baking Co. v. Trizzino*, 161 N. E. 557 (Oh. App., 1928).

(3) *Williston, On Sales* (2d ed. 1924) Sec. 244.

consumer who, justifiably relying on those statements, purchases the product.

It is worthy of mention that there is good authority that an action in tort as well as an action in contract may be brought for a breach of certain express warranties, with the resulting liability being regarded as imposed by law.⁽⁴⁾

It is probable that suit is instituted more frequently on the basis of alleged breach of warranty than on a negligence basis, because it is often quite difficult to prove negligence in these cases. The difficulty of proof is lessened in some jurisdictions by the fact that evidence of the presence of a foreign substance in food or drugs practically establishes a case of negligence and further, in a minority of jurisdictions, by the rule of tort law that where normally an injury would not occur without negligence and where the means of preventing it or explaining its cause are within the control of the defendant, the plaintiff need not introduce evidence of negligence. Regardless of whether there is a warranty, the injured consumer can secure damages if negligence can be proven. It is in actions based on this theory that the manufacturer or distributor can best be reached. An action in negligence is ordinarily the only basis under which an injured non-purchaser can obtain damages.

Violation of pure food and drug acts has been held sufficient to show negligence and permit a recovery, since these statutes are enacted for the public's protection from the very harm suffered. If the pure food and drug acts are made broad enough, the difficulties of proof in negligence actions largely disappear. The Product Public Liability policies of some companies exclude coverage, however, if the goods contain any article in violation of any Federal, State or Municipal Law.

It may safely be stated that the common law is changing to meet changing conditions. Yet even today, injured persons face the possibility of a test case, since the more stringent rules imposing liability are not yet decided law in most jurisdictions. Although the common law is still a maze of conflicting theories and old precedents which may operate to bar the injured consumer from damages, the tendency will undoubtedly be to develop a law imposing liability, which will induce those supplying goods to settle quickly with injured consumers.

(4) Williston, On Sales (2d ed. 1924) Sec. 197.

In addition to needing insurance protection against their legal liability for injuries resulting from actual defects and mistakes, manufacturers and dealers need protection against the numerous faked claims and hold-up suits which are instituted on the basis of alleged defects in goods. These are very frequent under this line of insurance, particularly in connection with food or drug coverage. Certain territories are notorious for the legal and medical situations in connection with liability claims.

PRESENT COVERAGE AND RATES

The coverage under Product Public Liability is defined in the manual as follows: Insurance against claims in connection with the possession, consumption, handling or use away from the assured's premises by any person or persons, except employees of the assured while engaged in the business of the assured, of any merchandise or product manufactured, sold, handled or distributed by the assured on account of accidental bodily injury including death at any time resulting therefrom. This coverage includes the explosion or rupture of any container within which the product is delivered by the assured. The policy also covers such immediate medical and surgical relief as is imperative at the time of the injury.

Although the policy contracts specifically mention accidental bodily injury, it should be understood that illness and disease are construed to be accidental bodily injuries when it is obvious that in the chain of causation there was a contributing factor whose presence was so unintentional, unexpected and unusual as to bring the whole series of causative acts within the accepted definition of accidental. It is worthy of mention, however, that the courts do not allow damages for fright and shock unless the fright actually causes a physical injury.⁽⁵⁾

The coverage afforded by Product Public Liability insurance is normally effective only for accidents occurring away from the assured's premises, but in the case of restaurants and similar enterprises this coverage applies also for food consumption accidents on the assured's premises. On risks other than of the restaurant type, the Owners', Landlords' and Tenants' Public

(5) Kenney v. Wong Len, 81 N. H. 427, 128 A. 343 (1925).

Liability policy or the Manufacturers' and Contractors' Public Liability policy provides the necessary coverage on the assured's premises.

Neither the manual nor the policies and endorsements used by most companies are specific as to whether the coverage protects the assured in the case of suits brought on the basis of (1) negligence, (2) breach of implied warranty, or (3) breach of express warranty. The phraseology of most policies is that the insurance company agrees to indemnify the assured against loss by reason of the liability imposed upon him by law for damages because of bodily injuries as defined in the policy. This phraseology is apparently generally interpreted to cover suits alleging either negligence or breach of implied warranty. The policies are not interpreted to cover in the case of alleged breach of express warranty, because of the general belief that such cases are definitely of a contract nature and generally arise out of liability voluntarily assumed by the assured. In view of the fact that the policies are not worded definitely as to whether implied or express warranty coverage is provided, there is considerable doubt on the part of many agents as to whether retailers, for instance, are properly protected at the present time.

The rates for Product Public Liability coverage are in most cases applicable to the total sales of the risk in hundreds of dollars. Sales are defined as the entire amount of money (including taxes) charged for all merchandise or products sold or distributed by the assured during the policy period. No policy may be written covering only a part of the merchandise or products of a given risk, leaving uninsured other merchandise or products sold or distributed. Exceptions to this rule may be authorized upon application to the National Bureau. In the case of a few classifications, the rates apply per 1,000 fillings, per 1,000 gallons, etc., but the usual basis of exposure is sales.

The manual rule for additional interests' coverage is that individual risks involving additional interests must be submitted to the National Bureau for rating.

The coverage of a Product Public Liability policy is in effect only during the policy period and not beyond it. The coverage is, therefore, limited to accidents arising during the policy term. The policy period is normally one year, but in the case of risks where the Product Public Liability coverage is provided by en-

dorsement on a three year Owners', Landlords' and Tenants' Public Liability policy, the coverage may likewise be written for three years subject to annual premium adjustment without discount.

The Product Public Liability policy also provides that the coverage applies only to such merchandise as is actually sold to a purchaser for a consideration which appears in the amount of gross sales reported to the insurance company. In the case of food products and similar goods where the products are normally consumed within a relatively short time after sale, the insurance company accepts all claims incurred during the policy period. Perhaps the reasoning is that the hazard incurred on goods sold before the policy period but not actually consumed is offset by the goods which will be sold towards the end of the policy period but which will not be consumed before the policy expires. It would also be very difficult to identify the date of sale of most such products.

In the case of products such as washing machines, electric refrigerators, lamps, etc., where the goods are expected to last many years, the insurance companies do not provide coverage for such articles sold before the inception date of insurance unless an additional premium is paid by the assured. If the assured desires coverage on outstanding articles, as well as on those which will be sold during the policy period, the usual practice is to determine a flat additional premium charge for such coverage. The method of calculation varies somewhat, depending upon the type of product to be insured. Usually it is assumed that there will be no liability for articles more than five years old, because any inherent weakness in the product would have shown up by that time and because the manufacturer or dealer would have the defense that wear and tear rather than structural defects would be responsible for any injuries resulting at that late date. The general method is to apply the manual rate to the sales of the preceding years weighted by percentages totaling to 150%. For example, the weights applicable to the sales of the five preceding years are 50%, 40%, 30%, 20% and 10% respectively. In the event that it is not possible to determine the sales for each of the previous five years and it is estimated that the sales during each of those years were approximately the same as the current sales, a flat additional premium charge of 150% is made for

coverage on products previously sold. The payment of this additional premium assures coverage for all products in use during the policy period but, of course, no coverage beyond the expiration date of the policy. The calculation must be repeated on renewal in order to again provide the coverage for both current and prior sales.

No coverage is provided for sample products which may be distributed by an assured unless the money value equivalent of such samples is included with the gross sales in determining the premium. In the case of goods which are left with prospective customers on demonstration, the merchandise to be used by the prospective customer for the time being, coverage is provided for such demonstration hazard, with no extra premium charge. While the goods are actually being demonstrated by the assured's employees, the necessary coverage is afforded by the direct liability policy, of course, and not by the Product Public Liability policy.

The manual rates provide for a limit of \$5,000 for all damages arising out of bodily injuries to or death of one person; and, subject to that limit for each person, a total limit of \$10,000 for all damages arising out of bodily injuries to or death of two or more persons in any one accident. If merchandise or product from one prepared or acquired lot after the sale produces injuries to more than one person, the injuries to all persons proceeding from that common cause are considered as constituting one accident. Subject to the foregoing limits, an aggregate limit of \$25,000 for all damages arising out of bodily injuries or death during the policy period is provided. The purpose of the aggregate limit is to provide some degree of protection to the insurance company where a whole series of claims may develop in such a way that the accident limit is of no value whatsoever, because there is no provable relationship between the specific cause and the specific effect.

Limits higher than 5/10 and \$25,000 are written upon application of the factors shown in designated excess limits tables. Table A is used with a number of the more hazardous classes and Table B applies in the case of the remainder. If the accident limit exceeds \$25,000, the aggregate limit becomes the same amount automatically. If an aggregate limit in excess of \$25,000 and in excess of the accident limit is desired, the factor used is

20% of the factor for the desired per person/per accident limit plus 80% of the factor for the same per person limit combined with an accident limit equal to the desired aggregate limit.

EXAMPLE

\$5,000 per person/\$50,000 per accident/\$100,000 aggregate		
20% of 1.14 (Table B factor for \$5,000/ 50,000)	=	.228
80% of 1.19 (Table B factor for \$5,000/100,000)	=	<u>.952</u>
Total (Table B factor for \$5,000/50,000/100,000)	=	1.180

In the case of large risks where the difference between the risk premium and the amount of the aggregate limit is considerably less than in the average sized risk, the risk may be submitted to the National Bureau for individual consideration and treatment as respects the aggregate limit feature. In general, the annual premium for risks to receive such individual consideration should be not less than \$5,000 at standard limits.

If the aggregate limit under the policy becomes almost or fully exhausted, the carrier notifies the policyholder. The carrier continues to investigate and defend all claims that may arise until the coverage is actually terminated. Earned premiums are determined on the basis of only the actual earned exposure during the period of coverage, regardless of the amount of incurred losses. If, after the development of losses on a policy with a corresponding reduction in the aggregate limit, the assured desires to increase the aggregate limit for the remainder of the policy period, additional limits of liability may be purchased for additional premiums based on the factors in the manual excess limit tables. Such additional limits apply only for the remainder of the policy period, and the increased aggregate limit, less claims for accidents which occurred previously, applies only from the date on which the additional aggregate limit is purchased.

An Experience Rating Plan is applicable in three states: Minnesota, New York and Wisconsin. Product Public Liability risks which develop an exposure during either the latest year or the latest two years of the experience period such that the application thereto of manual rates for standard limits produces a premium of not less than \$1,000 qualify for experience rating. The Plan is applied on an intrastate basis. Classifications which are (a) rated are not subject to experience rating.

NEED FOR CLARIFICATION OF COVERAGE AND ENDORSEMENTS

In view of the probability that the premium volume of the Product Public Liability line will increase substantially within the next few years, it is essential that the policy forms and coverage be revised to conform with present day needs. The insuring agreements should be made so clear and definite that the coverage will be easily understood by the average layman and insurance producer who are not often familiar with the interpretations which may be placed upon policy coverages by the claim departments of the companies.

It seems quite likely that Product Public Liability coverage will always be provided by an endorsement attached to either an Owners', Landlords' and Tenants' Public Liability policy or to a Manufacturers' and Contractors' Public Liability policy. The coverage provided by the Product Public Liability endorsement consists essentially of eliminating the standard exclusion of the direct liability policy to the effect that there is no coverage for injuries caused by the possession, consumption, or use elsewhere than on the assured's premises of any article manufactured, handled, or distributed by the assured unless covered by written permit endorsed on the policy. It might be desirable, however, to give consideration to the preparation of a separate policy form limited to Product Public Liability insurance.

The Product Public Liability endorsement should specifically state that coverage is provided for claims alleging breach of implied warranty in addition to those alleging negligence. It would be desirable definitely to exclude coverage for any liability based upon an express warranty or any liability voluntarily assumed by the assured, whether orally or in writing. The endorsement should also state clearly that illness and disease are covered. In order to furnish assureds with the coverage they actually need, it might be well to broaden the policy coverage to include illness and disease without the restriction that they be of a nature which can properly be construed to be accidental.

Liability based on express warranties as a general rule cannot safely be covered without careful examination of the express warranties by the home office of the insurance company. For this reason, such coverage should be specifically excluded from the general Product Public Liability endorsement. It should be

permissible, however, for an assured to purchase, by payment of an additional premium, coverage for any liability which may be incurred as the result of express warranties. Such coverage would be subject to careful underwriting and it would be necessary to receive copies of all express warranties issued and also of all labels and advertising material, so far as practicable. The insurance company would necessarily have to maintain a fairly close contact with certain types of assureds in order to be certain that the advertising material, labels, etc., were not changed to a degree which would seriously affect the insurance hazard. As a safeguard, the insured express warranties could be quoted in the Product Public Liability endorsement.

The endorsements used by the various companies should be standardized. At least three separate endorsements should be prepared: one for restaurants, etc., where the coverage is both on and away from the assured's premises; one for other food or drug risks; and a third for use in writing coverage on products of a durable nature.

The classifications which cover products of a durable nature should be definitely indicated in the manual as compared with those which cover such products as foods which are normally consumed relatively soon after their manufacture and sale. A uniform method of writing the coverage on durable merchandise previously sold should be developed and printed in the manual. It is not practicable to merely increase the manual rate applicable to current sales in order to reflect the hazard assumed on previous sales because the degree of hazard thus assumed varies widely from risk to risk. The possible liability in connection with a firm which has been in business for many years is much greater than that of a firm which only recently commenced operating. The volume of business transacted from year to year also varies greatly. Although the degree of liability which exists in connection with products sold prior to the effective date of insurance may also vary somewhat between classifications, nevertheless it would be desirable to develop a general rating method for this coverage. It would be a fair basis to assume, for example, that in general some degree of liability exists on products sold during the previous three year period and that the total premium for all products of the assured previously sold should approximate the premium charged for a single year's current

coverage, using a standardized system of weights against the exposure of the three preceding years.

The subject of additional interests' coverage for this line deserves thorough study in an effort to develop definite rules for inclusion in the manual. Admittedly, the degree of liability assumed through additional interests' coverage varies considerably among different risks, but it should be possible to formulate definite rules for the additional premium charge for inclusion in the manual. The standard additional premium charge of 25% should apply only where the product is sold by the distributor in the form received from the manufacturer without alteration. If the product is altered in any manner by the distributor before being sold, a substantial increase in the premium charge becomes necessary for such additional interests' coverage, since it is often difficult to determine which party was negligent where the form of the product was altered by the distributor. Obviously, no coverage should be afforded to the additional interest in this manner for any liability resulting from sole negligence on his part.

INFLUENCE OF PRICE TRENDS ON EXPERIENCE

An analysis of the experience under Product Public Liability coverage during the last ten years, as given previously in Exhibit I, shows that this line produced favorable results in the early years after its introduction but that in recent years the experience has become very adverse. Unquestionably, there has been an increase in claim-mindedness with regard to this line as well as other liability lines. In addition, although relatively few cases have actually been decided in court, the tendency to liberalize the law for the benefit of injured consumers has probably been reflected in the experience to some extent.

A major factor in causing the unfavorable trend in recent years has undoubtedly been the fact that the prices of foods and other goods have generally been falling during this period. The exposure basis for approximately 75% of the premium volume of this line is sales, and any downward trend in prices would react adversely on the experience. The premium income of the insurance companies would be reduced proportionately with little, if any, offsetting effect on hazards and claim costs. The trend of wholesale prices for all commodities combined as taken from the

monthly Labor Review of the United States Department of Labor is as follows:

EXHIBIT II
INDEX NUMBERS OF WHOLESALE PRICES
(1926 = 100)

Period	All Commodities
1924	98.1
1925	103.5
1926	100.0
1927	95.4
1928	96.7
1929	95.3
1930	86.4
1931	73.0
1932	64.8
1933	65.9
June 1934	74.6

The trend of wholesale prices of farm goods and foods was more sharply downward than that of other products. These data indicate how severely the premium income of insurance companies on this coverage has been affected, and this fact probably accounts to a considerable extent for the very adverse experience trend. The low point was reached in February 1933, for which the index number was only 59.8, or 40% below the average for 1926, which is generally considered to be a normal year. The trend of prices is now upwards, but it will probably be a considerable time before the price level of 1926 is again reached.

EXPOSURE BASIS

The conclusion to be drawn from this brief analysis of price trends is that the present exposure basis of sales has little to commend it except that sales data are always readily available for audit purposes. It is apparent that a new exposure basis is needed for this line of insurance. It would be desirable to change as soon as possible from a sales basis to a unit or quantity of product basis⁽⁶⁾ in the case of all classifications for which such a change is practicable. It seems likely that consideration has been given to similar proposals in the past, but that no change has been made because of the difficulty of establishing an exposure basis, the data for which would be normally ascertainable

⁽⁶⁾ For a discussion of the comparative merits of these three exposure bases, see "Notes on Exposure and Premium Bases" by Paul Dorweiler, Proceedings Casualty Actuarial Society, Vol. XVI, p. 341.

for audit. The problem deserves detailed study, however, since it is one which must be faced if a proper unfluctuating exposure basis is to be established for this line. It appears that such a conversion from the sales basis of exposure could be made in the case of most classifications other than those covering stores.

An exposure basis of sales does not satisfactorily meet the requirement that within each classification the hazard per risk should be proportionate to the exposure. There is no reason why the manufacturer of shoes wholesaling at \$5.00 per pair should pay twice as much premium per pair as another manufacturer whose shoes sell at wholesale for \$2.50 per pair. As a matter of fact, there very likely may be less hazard connected with the more expensive pair because of better manufacturing processes. Most classifications contain wide variations in price range, and the more expensive goods are penalized as compared with low-priced goods although they are probably more carefully prepared and, therefore, less hazardous. Similarly, there is undoubtedly a greater hazard connected with the low-priced electric refrigerators which were manufactured in 1933 and perhaps even more so in connection with the "chest type" refrigerators which are now selling in the neighborhood of \$75.00 each than was the case with the more expensive refrigerators previously marketed. It is a fair assumption that increased risk of mechanical defects and leakage of refrigerant goes with cheaply constructed refrigerators. The sales basis of exposure certainly does not properly reflect the hazard, but a unit basis of exposure would eliminate much of this objection. Prior to 1933, the exposure basis for gasoline and allied products was sales including taxes. This was not a proper exposure basis because the price of gasoline fluctuates considerably and also the state taxes vary a great deal. The present exposure basis is per 1,000 gallons and this has corrected the situation. A similar change in exposure basis appears desirable for all classes now rated on a sales basis, where such a change is feasible from the audit standpoint.

NEED FOR RATE REVISION

There never has been a general revision of Product Public Liability rates. The rates for the more important classifications have been trued up from time to time as the available experience indicated that they were particularly out of line. A fairly sub-

stantial volume of classification experience covering policy years 1927-1931 has now been compiled by the National Bureau to serve as the basis for a general revision of rates. This experience should offer fairly reliable indications of classification relativity. If the insurance companies are to write this line of insurance with a fair chance of breaking even, it is essential that the general rate level be increased substantially. This revision should be made concurrently with the modernization of coverage and endorsements and with the change in exposure basis from sales, wherever possible.

The only instance of the use of territorial differentials for this line of insurance is in the case of the Bakeries classification, where the manual rate for Massachusetts and New York is twice that for the remainder of the country. The classification experience has never been reported to the National Bureau completely subdivided by territories. There is, therefore, no experience available to indicate whether there is any necessity for territory differentials. The statistical plans in use in the insurance companies provide for the coding of the experience by territory, but this information could only be obtained by special calls if the experience were desired by territory. As a practical matter, it would be difficult to introduce territory differentials in the case of goods other than foods which are manufactured largely for local consumption.

A general revision of rates for this line of insurance should recognize not only the known trend of experience but should include a judgment projection factor to recognize the growing tendency to hold manufacturers and dealers liable for damages as a result of defective goods. If such a bill as the Tugwell-Copeland Act were to be enacted by Congress, it would remove many of the difficulties of proof in certain negligence actions since violation of a pure food and drug act has been held sufficient to show negligence and permit a recovery. This adverse effect might be off-set to some extent by the fact that many products containing harmful substances which are now legally marketed would be prohibited by such a statute.

UNDERWRITING POLICY

Before the insurance companies can even consider opening up on this line, it is absolutely necessary that the coverage be made

definite and that a general revision of rates including practicable changes in the exposure basis be effected. Even then, it will be necessary to underwrite the line with caution. It would seem to be desirable for each company to endeavor to develop a specialist in the writing of this business. This coverage is still "loaded with dynamite" even though an aggregate policy limit has been introduced in addition to the per person/per accident limit. A good example of what can happen is the case of a certain cream depilatory which was widely advertised several years ago. The American Medical Association made a vigorous attack on this product, reporting that the active ingredient in the cream was thallium acetate, an exceedingly poisonous chemical having no known antidote. In spite of this protest, the product was passed by the New York City Department of Health and many large department stores continued to sell it. The manufacturing concern finally failed with \$2,000,000 in claims against it, representing damages sought by persons who had used its product. Voluntary bankruptcy was the convenient expedient by which the promoters evaded settlement. An insurance company must be extremely careful in insuring the Product Public Liability hazard of any such product.

In underwriting Product Public Liability submissions it is important to know how the assured will want claims handled in order to protect his good-will. Most assureds wish to avoid publicity and want payments made to settle claims quickly even though many such cases must be classed as of the nuisance variety. Other concerns will want cases fought, being unwilling to admit that foreign substances or defects could be present in their products. The attitude of the assured concerning the making of good-will settlements has a great deal of effect on the experience of the individual risk.

A particularly effective method of writing many risks is to provide deductible coverage. This is especially true of risks handling food products. If the assured must pay the first \$50, \$100 or \$250 of each claim, it is found that he is more willing to cooperate with the insurance company, especially in the matter of securing witnesses for his own defense. Where the coverage is written on a deductible basis, the assured is likewise more willing to cooperate in the prevention of accidents. Less pressure is brought to bear on the insurance carrier to settle nuisance

cases for the sake of good-will. On the other hand, with this form of coverage care must be taken not to incur excessive legal expense in fighting all claims, justifiable or otherwise, merely because the assured wishes to escape paying up to the amount of his retention on each claim. If properly handled, this form of coverage may be the salvation of the insurance companies in writing Product Public Liability coverage on risks manufacturing or selling food and drug products.

CONCLUSIONS

The conclusions to be drawn from this analysis of the Product Public Liability line are as follows:

1. It is probable that the premium volume of this line of insurance will increase substantially in the near future.
2. The policy coverage should be clarified through the preparation of clearly worded, standardized endorsements.
3. Recent experience has been adverse because of the deficiencies of sales as an exposure basis together with the increasing claim-mindedness of the public.
4. A complete revision of manual rates should be made effective within the near future, including a change from an exposure basis of sales to unit or quantity of product so far as possible. A uniform method of determining the premium to be charged for providing coverage on merchandise previously sold should be included in the manual. Definite additional interests rules should be published.
5. A conservative policy of underwriting this line should be followed. Many risks manufacturing or handling food or drug products should be written on a deductible basis.
6. An attempt should be made to develop the premium volume on classes other than those dealing with food or drug products so that a better spread of risk from an insurance standpoint will be obtained.

THE CONTROL OF ACCIDENTS THROUGH WORKMEN'S COMPENSATION RATING

BY

ROBERT S. HULL

Workmen's Compensation is a social service having for its immediate object the care and support of injured workmen during periods of disability due to industrial accident.

A secondary, but even more important object, should be the prevention of accidents, and most insurance companies devote a considerable amount of time and money to that end. Under plans of experience rating, the care exercised by the employer in accident prevention is to some degree reflected in his rate, but the experience of employers which have cooperated whole-heartedly with the engineering departments of the insurance companies indicate that there are still impressive possibilities in the field of accident prevention.

The doctrine of assumption of risk has practically disappeared as a legal defense in industrial accident cases, but it is to be feared that it still exists in the subconscious thinking of employers. That is, if they provide working conditions which are reasonably safe for a careful man who understands the risks involved, they consider their duty in the matter is done, and if avoidable accidents still occur, it is something for the insurance company to worry about.

If a system of workmen's compensation rating could be devised which would stimulate to the full the interest of all employers, large and small, in accident prevention, the social service rendered by workmen's compensation would be vastly increased.

From the viewpoint of rate making, it has been demonstrated by years of experimentation that the companies have yet to find a system of rating risks which will produce adequate and equitable rates, or if they could devise such a system in theory, they have been unable to put it into practical effect. With all the modifications that have been introduced into the original practice of rating by occupational classification, including experience rating, schedule rating, equity rating, the use of loss constants and

of expense constants, the system still fails to work satisfactorily. The individual quality of the risk is in many cases a factor of greater importance than the occupational grouping to which it belongs, even after all possible rate modifications have been made.

From time to time writers or speakers who should be better informed comment upon the evil of permitting insurance companies to make millions of dollars profit out of the misfortunes of injured workmen through handling workmen's compensation insurance. If this were not tragic, it would be funny.

It may be taken for granted that the insurance companies would be willing to handle workmen's compensation as an accommodation line without profit to themselves if they could be reasonably assured against considerable losses.

Is it possible to devise and to put into operation an equitable system of Workmen's Compensation rating which will stimulate accident prevention and which will at the same time permit the companies to handle the business on a cost basis without involving themselves in staggering losses?

It would probably be easier to devise such a system than to put it into operation. The following paper attempts to suggest such a system in outline. If the basic theory is sound, the actuarial talent of the Society should be sufficient to work out the details. The difficulties in the way of the application of the theory are immediately obvious but are perhaps not insurmountable.

Broadly speaking, it may be said that the two principal elements entering into workmen's compensation losses are:

- 1—Accident frequency
- 2—Accident severity

It is here suggested that the first is so far controllable as not to be a proper subject for insurance, but that the second answers more nearly the criteria of insurability.

The proper function of insurance is to equalize the losses among risks of similar hazard, so that the purely accidental incidence of losses may not fall too heavily on the individual assured. In order to be insurable in the strictest sense, a hazard should not be such that it is under the control of the assured, either through willful acts or negatively through carelessness or neglect.

The experience of insurance companies indicates that acci-

dent frequency is to a large degree under the control of the individual employer; that an efficiently managed plant where accident producing conditions are consistently studied and eliminated and where careless employees with records of frequent accidents are re-trained, transferred, or eliminated, will show a better experience than another plant in a less hazardous classification where those conditions do not obtain.

It is submitted therefore that no system of classification can be devised which will properly group risks as to the accident frequency hazard, and that the greater social good would be accomplished by making every employer financially liable, to some extent at least, for every accident occurring in his plant.

Accident severity, on the other hand, represents to a large degree an accidental hazard, affected to a considerable degree by the nature of the industrial process being carried on. Over a large number of occurrences it would be possible to determine an average cost per accident in any given classification. The logical conclusion is then that the proper function of the insurance carrier is to guard the assured against the risk that the accident in his particular plant may exceed in severity the average accident in his classification.

Any employer operating a plant with more than a small number of employees should be able by the exercise of proper care to keep the accident frequency in his plant so far within bounds that the payment of compensation on such accidents at an average rate would be no more of a burden than a reasonable insurance premium; but if the accidents in his plant chance to produce fatal or major injuries the burden might be crushing.

Specifically, then, it is suggested that each employer pay a premium representing a fixed charge for every accident occurring in his plant which involves loss of time at the injured man's regular occupation beyond the day or shift in which the accident occurs, plus an expense charge. If an employer has had no accident, his premium would be limited to a carrying charge sufficient to cover the expense of handling the policy. A still broader base would be secured if a charge could be made for every accident of any kind, but it is possible that such a method might result in a consistent failure to report and possibly to treat small cuts and scratches which if treated would be unimportant but which might result in infection if neglected.

The standard charge per accident would be compiled by the state industrial commission on the basis of accident reports submitted by the insured and of the incurred loss costs as reported by the insurance carrier. It would be computed by industrial classification, but, after a period of experimentation, it should be possible to combine the present classifications into a few groups according to their record of accident severity. Fatal and permanent total cases occurring in any classification would be valued at a stated average for all classifications.

An assured's deposit premium would be figured by multiplying the number of lost time accidents in his plant in the past year in each of his classifications by the average costs as published by the industrial commission, and adding a suitable expense loading. If the insured's program called for a changed schedule of production during the coming year, the rates could be modified by the ratio of expected payroll to the payroll for the past year.

At the year's end, the assured's premium would be adjusted according to the number of lost time accidents actually incurred.

Acquisition costs should be based on a flat charge covering the average office cost to the agency for handling a policy, plus a percentage of the premium graded down with increasing size of the risk. If the companies handled workmen's compensation as an accommodation line without profit to themselves, the agents could reasonably be expected to do the same.

Home office administration costs should be based on a minimum handling charge plus a graded percentage of the premium decreasing with the size of the risk.

Adjusting expense should be charged as a flat percentage of the premium or as a flat charge per accident.

The result of this method would be to make the employer responsible for accident producing conditions in his plant but to protect him from unusually heavy or catastrophic losses. The insurance company would furnish this protection at the minimum practicable cost, but would in effect be protected from heavy losses if the average cost per accident were properly computed. The company's profit, if any, and provision for contingencies would come from possible savings in the expense loading and from interest on funds handled.

Under this system inspection and accident prevention work might be furnished at cost by the insurance company and paid

for directly by the employer instead of being included as a percentage of the rate.

Underwriting costs would be somewhat reduced, as the element of judgment in the selection of risks would be minimized.

Payroll audit costs would be eliminated, as well as losses from failure to report the full payroll. Some system of check up on accidents might be advisable, but if sufficiently drastic penalties for failure to report such accidents to the commission were imposed, this should not be generally necessary.

If industrial classifications were combined into a few groups as suggested above, statistical costs would be considerably reduced.

So much for the theory. Now let us consider the limitations of the plan and the practical objections to it.

The first and obvious practical objection is that it would bear heavily on the small employer who was unfortunate in his accident experience. This is undoubtedly true and when the exposure is so small the occurrence or non-occurrence of injuries comes nearer to being an accidental happening than is the accident frequency rate in a large plant. On the other hand, it is true that a large percentage of workers are employed by small employers and the accident experience of such employers is less favorable than that of large employers. This may be assumed to be due to the fact that accident prevention methods are less efficient in the small plants. If then the occurrence of an accident in the plant of any small employer is a distinct loss which he will be at pains to avoid if possible, the standard of accident prevention among the group as a whole would be raised. While the individual employer might suffer to the extent of having to pay the standard cost for every accident incurred, the burden under this plan should not be a crushing one, and if the plan resulted in fewer injured workmen, it should be justified by that fact.

Difficulty would be encountered in securing official sanction for the above system over the objections of a multitude of small employers and it is probable that they would have to be excepted from its operation to a considerable extent.

The actuarial problems of the plan would be concerned with the computation of the average cost per accident. Data relating to accident occurrence would have to be collected by a state body such as the Industrial Commission who would be charged with

enforcing the penalties for failure to report accidents. The accident data reported to them should be used as a check on the number of accidents as reported by the companies. Accident cost by classification would be subject to modification for trends in wage scales and would vary with the degree of malingering as affected by industrial conditions and with the liberality of the commissions and courts in awarding benefits. Problems relating to medical costs would remain in full force.

The above plan represents a radical departure from present methods and though the soundness of the theory be granted, the practical difficulties are great. The writer has discussed it with a number of capable insurance men and the interest that they have displayed in it has encouraged its presentation to the Society.

REPORTS OF CASUALTY INSURANCE—
LOSS RESERVE SCHEDULES

BY

JOHN R. LANGE

The sessions of the National Convention of Insurance Commissioners, the insurance press and financial reports have given considerable time and space to the question of proper admitted values to be placed on bond and stock assets of casualty and surety companies. The total on the balance sheet known as "Admitted Assets" has been in the limelight since market disturbances began but on the liability side, "Total liabilities, except Capital and Surplus" has remained in the background. Each year, the Committee on Valuations has a report to make which is the principal topic under discussion at the December meeting of the commissioners but the standing committee on Reserves Other Than Life has had no report in the proceedings on the matter of loss reserves since 1917. When financial strength and solvency are under consideration, proper reserve or liability values are as important as asset values.

In the auditing of annual statements of casualty and surety companies by state supervisors, examiners and company executives, the asset schedules are carefully scrutinized, but observation has shown that the schedules supporting liabilities are in many cases examined only as to the totals that are carried into page five of the statement. The construction of these loss reserve schedules and the past history they reveal as to inadequate reserves in prior years' statements has, very often, escaped notice or comment. Schedules G, J, K, O and P are as important as Schedules A, B, C, D and N.

The construction of Schedule P should prove to be of more interest to the student than any of the other loss reserve schedules. At the outset, it is well to know if the company writes at full manual rates and is careful in the selection of risks or if the rates charged are of its own promulgation or a deviation from manual.

The excess of the grand total of gross premiums written as shown in Column 1 over the previous year's grand total should agree with the net writings appearing as income on page two, Items 7 and 8. The distribution to policy years of the calendar year's net premium income should be verified through the

amounts appearing in footnote (a) on page two of the annual statement. The earned premiums represented by the grand total of Column 2 of the schedule subtracted from the grand total of Column 1 should equal the unearned premium reserve, Items 22 and 23 of the Recapitulation on page seven. If no policies are written which run more than one year from date of policy then the entire difference or unearned premium reserve is found to be in the last policy year. A participating company which has charged in its premiums a loading solely for dividends, such loading having been approved, may show a greater difference between the two grand totals than the amount of the unearned premiums due to the deduction of such loading or dividends from the earned premiums shown in Column 2.

The excess of the grand total of liability loss payments over the grand total of Column 3 in the previous year's schedule should agree with the net losses paid, Items 4 and 5, page three. The distribution of these loss payments to policy years can be approximately verified by comparing the additions to the several policy years with the decreases in the unpaid losses of the respective policy years as shown by Column 12 for the two years.

The excess of the grand totals of the allocated and unallocated loss expense payments over the previous year's grand totals cannot be verified through the expense items shown on page three. However, some companies in their claim expense accounting will report only allocated claim expense under Item 20, page three. In such cases the change in the grand total of Column 4 agrees with the disbursement line. In the listing of the grand totals of earned premiums, losses paid, allocated and unallocated loss expenses of the 1933 schedules of representative casualty companies the following ratios of the aggregate of the totals obtain:

Ratio of allocated expense to earned premiums..	4.871%
Ratio of unallocated expense to earned premiums	6.461%
Ratio of loss expense to earned premiums..	<u>11.332%</u>
Ratio of allocated expense to loss payments....	10.781%
Ratio of unallocated expense to loss payments..	<u>14.302%</u>
Ratio of loss expense to loss payments.....	25.083%

Any schedule under examination which reflects ratios much in excess of the above 11 and 25 per cent ratios will bear further investigation as to the proper proportion of general expense

which is distributed in the schedule as unallocated liability loss expense.

A correct mechanical construction of Schedule P does not mean that a proper loss reserve will result. The purpose of the schedule is two-fold: to show loss experience by policy years and to exhibit an adequate reserve for unpaid losses, including incurred but not reported claims, and future claim adjustment expenses thereon. Inadequacy of the unpaid loss reserve for the current year is not as apparent as the understatement of the reserve for the unpaid losses at the end of the previous year. Continuous inadequate reserves lead to a presumption of inadequate current year's reserves. The following test applied to Schedule P brings out the inadequacy of the reserves a year ago on completed policy years:

**TEST OF ADEQUACY OF SCHEDULE "P" DEC. 31, 1930,
LIABILITY LOSS RESERVES
Name of Company (In Receivership during 1933)**

Policy Year	Loss and Loss Expense Payments per Schedule "P"—Company's Figures, Column 7		Amount Reserve Should Have Been	Reserve Carried by Company 1930
1924	Paid in 1931 Still Open	\$1,174,818	\$ 13,765	\$ 8,000
		\$1,166,508		
1925	Paid in 1931 Still Open	\$ 8,310	\$ 10,035	\$ 12,000
		\$ 5,455		
1926	Paid in 1931 Still Open	\$1,409,540	\$ 68,482	\$ 39,950
		\$1,403,083		
1927	Paid in 1931 Still Open	\$ 6,457	\$ 156,709	\$ 76,500
		\$ 3,578		
1928	Paid in 1931 Still Open	\$1,807,716	\$ 343,332	\$162,750
		\$1,767,222		
1929	Paid in 1931 Still Open	\$ 40,494	\$ 739,393	\$261,315
		\$ 27,988		
Totals	Reserve Carried	\$2,047,121	\$1,331,716	\$560,515
		\$1,931,577	\$ 560,515	
			\$ 771,201	Inadequate or 138%

Ultimate settlement costs constitute the real test for loss reserve adequacy. Some losses remain unpaid from one to ten years or longer and to wait until all losses outstanding as of a certain date are paid would delay the test so as to make it almost worthless. Corrections for inadequate reserves should be made when the liability for loss still exists. During the year following the construction of a company's loss reserve, a large portion of such losses become paid and the balance of the claims still outstanding have, during the twelve months, been so developed that quite accurate estimates of the probable settlement costs can then be made. Individual cases may be misjudged but the aggregate should approach somewhat near the actual future costs of all the claims. In the above test the reserve for the "Still Open" claims are the amounts used by the company in Column 12, the case-basis. If these cases are still underestimated the 138 per cent inadequacy will grow; however, with the development they have had, some credence should be given them, at least for trend or test purposes. The reserve for the incompleted policy year of 1930 was \$682,187, a "remainder" reserve, but as Column 14 for 1929 and prior policy years always showed developed loss ratios in excess of the 60 per cent the conclusion may be made that the formula reserve for the last and incomplete policy year is inadequate.

The upward development of the loss ratio for each policy year as shown in Columns 14 and 23 of the schedule is another tell-tale of inadequate reserves. The above company's development of liability loss ratios was as follows:

Policy Year	Earned Premiums	DEVELOPED LOSS RATIO AT END OF								
		1924	1925	1926	1927	1928	1929	1930	1931	
1924	\$1,467,185	60.4	60.0	70.4	76.8	79.1	80.0	80.0	80.4	
1925	2,074,738		60.0	60.0	60.4	65.4	67.6	68.1	68.1	
1926	2,668,567			60.0	60.0	60.0	65.6	67.7	68.8	
1927	3,155,940				60.0	60.0	60.0	63.6	66.2	
1928	4,059,823					60.0	61.5	65.4	70.0	
1929	4,115,430						60.0	60.0	72.7	
1930	4,406,071							60.0	60.0	
1931	3,058,593								60.0	

When a policy year becomes completed or practically completed, as was policy year 1924 at the end of 1925 and thereafter the development of the year's loss ratio is upward from 60.0 per cent to 80.4 per cent, it is evident that somewhere along the

line the remaining claims were under-reserved by an amount approximating 20.4 per cent of the \$1,467,185 of earned premiums. To begin a policy year with only a 60 per cent loss ratio when the schedule of experience indicates that eventually the ratio will be 70 per cent is not making use of Column 20 headed, "Voluntary additional reserves for unpaid liability losses". It might be well to change the word, "Voluntary", in the column heading to "Required". When a company adds to a "remainder" reserve an amount required to bring the reserve for the policy year to a point of adequacy such additional reserve should not be termed a voluntary reserve.

Applying the test to Schedule P—Part 2, the workmen's compensation loss reserves of this company as of December 31, 1930 show the following inadequacy on completed policy years:

TEST OF ADEQUACY OF SCHEDULE "P" DEC. 31, 1930,
COMPENSATION LOSS RESERVES
Name of Company (In Receivership during 1933)

Policy Year	Loss and Loss Expense Payments per Schedule "P"—Company's Figures, Column 34	Amount Reserve Should Have Been	Reserve Carried by Company 1930
1924	\$ 971,011		
	\$ 963,651		
	Paid in 1931 \$ 7,360 Still Open \$ 84,201	\$ 41,561	\$ 33,527
1925	\$1,183,804		
	\$1,168,997		
	Paid in 1931 \$ 14,807 Still Open \$ 28,862	\$ 43,669	\$ 35,483
1926	\$1,256,647		
	\$1,227,073		
	Paid in 1931 \$ 29,574 Still Open \$ 55,207	\$ 84,781	\$ 68,093
1927	\$1,236,589		
	\$1,213,395		
	Paid in 1931 \$ 23,194 Still Open \$ 86,033	\$ 109,227	\$ 91,157
1928	\$1,747,193		
	\$1,642,873		
	Paid in 1931 \$ 104,320 Still Open \$ 143,875	\$ 248,195	\$188,215
1929	\$2,072,991		
	\$1,751,057		
	Paid in 1931 \$ 321,934 Still Open \$ 300,005	\$ 621,939	\$321,331
Totals		\$1,149,372	\$737,756
Reserve Carried		\$ 737,756	
		\$ 411,616	Inadequate or 56%

In this test the last completed policy year clearly shows the underestimate made of cases which were young as to development. Failure to include a reserve for some incurred but not reported claims may also have contributed to the inadequacy. On the older policy years, when interest discount is given consideration, the inadequacy was not as serious. The reserve carried for the incomplete policy year 1930 was \$302,283. Case-basis reserves were used by the company for all policy years.

Column 3 of Schedule O of this company's 1931 annual statement showed a total inadequacy of \$346,623 in the loss reserves of the 1930 statement on lines other than liability and workmen's compensation.

The loss reserve schedules in this company's 1931 annual statement indicate that reserves as of December 31, 1930 were inadequate by approximately the following amounts:

Schedule P—Part 1, completed policy years...	\$ 771,201
“Still Open” cases, estimated at 50 per cent...	260,063
Incompleted policy year of 1930, assuming ultimate loss ratio of 70 per cent on \$2,377,357 of earned premiums and deducting payments of \$744,228 made during 1930 and the \$682,187 of reserve carried.....	236,734
Schedule P—Part 2, completed policy years...	411,616
“Still Open” cases, estimated at 25 per cent...	162,046
Incompleted policy year of 1930, assuming ultimate loss ratio of 78 per cent on \$1,482,040 of earned premiums and deducting payments of \$687,251 made during 1930 and the \$302,283 of reserve carried.....	166,457
Schedule O reserves inadequate.....	346,623
	\$2,354,740

Total inadequacy..... \$2,354,740

On December 31, 1930 the surplus was reported at \$1,015,296 with \$1,000,000 of capital and a special contingent reserve of \$100,000. Forty-seven insurance commissioners relicensed the company sometime during the year 1931. Receivers were appointed early in 1933. Proper reserve or liability values are as important as asset values. Depreciation of asset values is not the only major contributing factor to the payment by receivers to creditors and claimants of from 40 to 60 cents on the dollar. When claims and claim expense are reserved for on that basis creditors cannot expect more, as any impaired capital that may remain as a surplus to policyholders is absorbed through asset shrinkage. Receivers and liquidators of fire insurance companies

have been able to pay higher liquidating dividends, as the problem of adequate loss reserve values is not present in the same degree as it is with casualty and surety companies.

Retrospection will show that some other casualty and surety companies which became insolvent during the depression were annually relicensed by many states when the reserve values for several years back were poorly calculated. Applying the above test to the 1933 loss reserve schedules of several companies licensed at this time results in 1932 surplus reductions of from 50 to 100 per cent. The 1934 schedules will reflect their financial condition as it should have been reported for December 31, 1933.

On the other hand, there are many casualty companies where reserve values are as important as asset values and company executives can rightly look with pride at their consistently adequate loss reserves or the "equity" which is contained therein. Applying the same test, in the same manner, to a company licensed in all of the states, the following results are shown:

TEST OF ADEQUACY OF SCHEDULE "P" DEC. 31, 1932,
LIABILITY LOSS RESERVES

Name of Company.....

Policy Year	Loss and Loss Expense Payments per Schedule "P"—Company's Figures, Column 7	Amount Reserve Should Have Been	Reserve Carried by Company 1932
1926	\$ 284,078		
	\$ 284,078		
	Paid in 1933		
	Still Open		
1927	\$ 453,443		
	\$ 453,343		
	Paid in 1933	\$ 100	
	Still Open		
1928	\$ 641,909		
	\$ 640,032		
	Paid in 1933	\$ 9,691	\$ 11,050
	Still Open		
1929	\$ 842,145		
	\$ 804,902		
	Paid in 1933	\$ 43,043	\$ 17,850
	Still Open		
1930	\$1,042,652		
	\$ 916,852		
	Paid in 1933	\$143,609	\$261,459
	Still Open		
1931	\$1,193,877		
	\$ 946,502		
	Paid in 1933	\$300,663	\$460,131
	Still Open		
Totals		\$497,106	\$750,490
Reserve Carried		\$750,490	

In addition to the above indicated "equity" of \$253,384 on completed policy years a further amount of about \$74,142 should be realized out of the reserve of \$610,372 carried for the incomplete policy year 1932. Earned premiums, so far, on that year were \$1,482,829 with loss and loss expense payments of \$279,325. The final developed loss ratio on that year is estimated at 55 per cent.

A downward development of the loss ratio naturally follows when the reserves carried for the unpaid losses is in excess of the ultimate settlement costs. In the above company the development of the liability loss ratio has been :

Policy Year	Earned Premiums	DEVELOPED LOSS RATIO AT END OF							
		1926	1927	1928	1929	1930	1931	1932	1933
1926	\$ 650,517	60.0	60.0	60.0	42.4	43.7	43.7	43.7	43.7
1927	887,976		60.0	60.0	60.0	49.8	50.9	51.1	51.1
1928	1,340,109			60.0	60.0	60.0	47.1	48.2	48.5
1929	1,641,936				60.0	60.0	60.0	50.1	51.6
1930	1,963,669					60.0	60.0	60.0	54.0
1931	2,345,536						60.0	60.0	60.0
1932	2,546,078							60.0	60.0
1933	1,578,055								60.0

It should be observed that a slight increase in the developed loss ratio at the end of the fifth year over the ratio at the end of the fourth year may be due entirely to the addition of the five per cent of the distributed unallocated liability claim expense for the current year which according to the formula method of distribution is added to the amounts shown in Columns 5 and 7 of the previous year's schedule. This increase is made in following the mechanics of the schedule even though there may be no further unpaid claims outstanding for that policy year at the end of the fourth year. Referring to the foregoing test it will be noted that on a percentage basis policy year 1929 was considerable under-reserved. The payments added to Column 7 during 1933 amounting to \$37,244 included \$8,193 of such distributed unallocated claim expense which is twice the 14.302 per cent hereinbefore mentioned. An error in punching the policy year on a loss payment card may also be reflected in the test.

When loss reserves and unearned premium reserves are rich with "equity", a meticulous valuation of bond and stock investments on a market, average market, or some other basis becomes of lesser importance.

A study of this type on loss reserve schedules does not produce final figures. Interest discount on installments claims, additional earned audit premiums, if any, and recoverable salvage are not taken into consideration. However, with only the two annual statements of a company at the disposal of the auditor he is able to make some interesting deductions which should play no minor part in the analysis of the financial statement of a casualty and surety company.

COMMENT ON THE UNDERWRITING OF COMPENSATION FOR SILICOSIS

BY

ROBERT V. SINNOTT

When particles of sand smaller than $1/2500$ of an inch in diameter have been inhaled by human beings in quantities too large to be ejected, or to be absorbed by the body's mechanical or chemical safeguards, the inevitable consequence is silicosis. The generally accepted theory of the action of the sand particles is that silica reacting with alkalies in the body forms silica hydrosol. This substance coagulates fluids of the lung tissue to such a degree that osmotic action cannot take place. Cells of the lung tissue starve. This action is continuous and ultimately results in total impairment of the lungs. During the process the sufferer's susceptibility to pneumonia and pulmonary tuberculosis is greatly increased. The disease may be definitely diagnosed by an X-ray study.

Sand, or to use the chemical term Silica, is used extensively in industry. As a result we find silicosis in many industries; and because it is so common and because its effects are so serious, it is the most important of the occupational diseases and compensation insurance for silicosis is one of the gravest problems facing the carriers today.

FORM OF COVERAGE

The nature of silicosis gives the underwriter a few hints to aid him in formulating a rating plan and an underwriting policy. Two main points are of importance:

- (a) Once contracted, it proceeds at a rate which varies with circumstances to the ultimate death or total disability of the subject.
- (b) No means are known of arresting its development.

Manifestly the conclusions are that every claim will be for permanent disability or for death. There is no known way to

rehabilitate a claimant physically. In the underwriting of compensation for industrial accidents, the desirability of a risk might be increased through the application of mechanical safeguards or through the safety education of employees. *Accidents* can be prevented but there is nothing to stay the progress of silicosis. Therefore, assuming no labor turnover, a risk would decrease in desirability from an underwriting viewpoint due to the progressive nature of the disease. Ultimately the employer would be unable to obtain insurance. A condition of this kind is contrary to public welfare, and the affected employee is certain to suffer. The alternative is to provide for the lean years in the fat years; to reserve a portion of the premium of each year to pay the ultimately inevitable claim.

A common sense thought is this, but disturbing elements enter into it. New employees come and old employees leave. The employer changes carriers. The hiring of one silicotic employee might throw the risk from the preferred class to the undesirable class. The underwriter who accepts the risk as new business has no accumulated premiums to pay possible claims. Of course, he might charge an excess premium to remedy this and to discourage switching, *but there are* legitimate reasons for changing carriers and in this case what title would the previous carrier have to the premiums he has accumulated on the risk? It might be possible to write policies for long term periods, but this device would not entirely mend the difficulty. Perhaps the only solution would be to make the carrier liable only for that proportion of the total award which its period of coverage bears to the total period of exposure of the employee. This suggests the underwriting, not of business enterprises, but of individual employees. The insuring of specific employees also solves the labor turnover problem. If a silicotic employee is hired the underwriter will know that another carrier is holding in reserve a contribution toward the claim. The implication here is that a central record of all exposed employees be kept by the insurance companies, preferably by the National Council on Compensation Insurance. A necessary condition is that policies of compensation insurance for silicosis be written on a per capita basis, instead of on a payroll basis as they are now written, and that the names of the exposed employees be indicated on the policy.

RATING PLANS

We now use the word "Subject" to mean a single employee, much in the manner that life insurance companies term a unit of coverage a "Life". Of the non-silicotic subjects a certain number will eventually contract the disease. For this number the underwriter must accumulate his reserve. Inasmuch as it is not known which of the group will be affected by the disease, it is necessary to assess the premium against the entire group. Suppose that it is determined that one man in three exposed becomes silicotic and assume that the premium charge for a silicotic subject is found to be an amount which we will designate by S . Then it would be necessary to charge an amount $S/3$ for each of the non-silicotic subjects.

With silicotic subjects it is necessary to consider three possibilities:

1. That the subject will die of silicosis.
2. That he will die of some disease complicated by silicosis (such as pneumonia or tuberculosis).
3. That he will die from causes unrelated to silicosis, as from an automobile accident.

It is necessary to distinguish between death by silicosis and death by diseases complicated by silicosis because proposed legislation provides that a lesser benefit shall be paid in the latter event. Of course, no compensation is payable in the third case. Assume that the average length of life from the first exposure to ultimate industrial disability of a subject who dies from silicosis is m years. Assume that out of k silicotic subjects experience indicates that a will die of uncomplicated silicosis. Assuming an average benefit of \$1.00, a dollars will be needed at the end of m years. $\frac{a}{m}$ must be collected each year or an annual per capita charge of $\frac{a}{km}$ must be made.

Suppose that experience indicates that b of the k silicotic subjects dies of diseases complicated by silicosis and that n years is the average period from first exposure to death or disability. Assume an average benefit of \$0.75. The carriers need \$0.75 b dollars at the end of n years, an annual premium of $\frac{\$0.75 b}{n}$

must be collected or a per capita charge of $\frac{\$0.75 b}{kn}$ must be made.

The total of these two charge $\frac{a}{km}$ plus $\frac{\$0.75 b}{kn}$ must be made for each silicotic subject.

The result of this calculation is to be applied to the average benefit under the accident or occupational disease laws of the state for which rates are being made. A difficulty here is that the average benefit at the time the premium is collected will be much lower than the average benefit when claim is made. Inflation and rising wage scales complicate the situation. The underwriter who in 1936 collects a premium based upon an average award of \$1,000.00 and who is faced in 1950 with a claim when the average award is \$2,000.00 is not going to enjoy the situation. His chances of collecting an additional premium from the employer based upon an exposure of 14 years prior are very meagre. The employer of 14 years before may be out of business. If still in business another carrier may be providing coverage. It would be hard to persuade him that an obligation to the 1936 carrier existed after 14 years. The introduction of a trend factor might solve the difficulty but where is the mathematical giant who can compute a trend factor reliable for the entire industrial life of a man?

A possible solution is for the current carrier to collect enough premium to make up the deficit in the previous carrier's reserve and to cede it to him after the manner of reinsurance, or to modify our previous provision making the carrier responsible only for that proportion of the award which his period of coverage bears to the total period of exposure modified by the ratio between the average award at the time of his coverage and the average award at the time of the claim.

The laws of various jurisdictions vary as to the responsibility of the carriers. Some states hold that carriers during the entire period of exposure are liable for the award. Others hold that the carrier at the time claim is made is responsible for the entire award. It is not proposed here to pass upon the justice or lack of it in either method, but it may be noted that in the first case, in accordance with the proposed plan, the carrier has a fund ready to pay its proportionate share of the award. In the second case it will be necessary for the carriers to agree to reimburse

the carrier held responsible for their proportional share of the award.

It might be deemed desirable to inaugurate experience or schedule credit schemes for the rating of individual risks. Due to the uncontrollable development of silicosis such credit can be given only where no evidence of the disease is present.

DATA

Eventually the carriers can build up from their case records something akin to life mortality tables showing the annual per capita charges for a basic award of \$1.00. These tables may be so refined as to differentiate between industry, race, and age of subject. These tables once established would change very slowly since changes in the table relating to silicotic subjects would be effected only by the success of the medical profession in combatting silicosis and the diseases complicated by it. Changes in the proportion of men contracting silicosis is only effected through the discovery and perfection of mechanical guards and through preventive hygiene. The tables would not be affected by increase or decrease in industrial activity, payroll fluctuations, state lines or the claim-wiseness of employees. It is essential for the construction of such tables as well as for rating purposes that X-ray examinations be made of exposed subjects at the beginning of each policy year.

PARTIAL DISABILITY

The subject of awards for partial permanent disability has been purposely avoided because there seems to be no definite crystallization of legal opinion on the subject. It is no more than reasonable to assume that the amount of any award paid for partial disability should be subtracted from a later award made for total disability. We have made allowance for permanent total disability, and an award for partial disability merely means paying out part of this reserve before permanent disability takes place. It will be necessary, however, to make an allowance for those cases where a recovery for partial disability is allowed, but where no claim is ever made for total disability. For example, an employee is awarded compensation for partial disability and

then is killed in an automobile accident. In states where recovery is allowed for partial disability an increment based upon the expected number of such cases and the average permanent partial disability award for silicosis must be added to the premium charge.

Compensation underwriters are seriously alarmed over the silicosis risk. However, the loss producing factors are far fewer than they are in industrial accident insurance. From this small preliminary survey one would judge that the probabilities involved may be closely measured. Perhaps it will not be the unsolvable problem it is expected to be.

COMPENSATION EXPENSES PER POLICY

BY

HARMON T. BARBER

In view of the recent history of compensation underwriting results and the attendant activity to stem the tide of loss in surplus, it is natural to find that most of the progress in casualty actuarial science as applied in late years to workmen's compensation has been concentrated in the development of rate making plans. Through the force of circumstance, the problem of compensation rate level has come to be regarded as supreme when, in more rational times, there undoubtedly would have been a well-rounded evolution of rate-making theory, including not only the procedure for determining general rate levels but also the adjustment of the premium of the individual risk to conform more closely to its probable cost. Experience rating and the small risk problem are two fields for study which are destined to receive increased consideration as soon as the rate level question becomes reasonably stabilized. As a matter of fact, the pressure for a more equitable treatment of the individual risk can be discerned in such comparatively recent expedients as the rating plans for transportation risks, house wrecking operations and the methods of dealing with occupational disease hazards. It is the purpose of this paper to direct attention to another development of recent months which may offer some basis for further progress, particularly in the solution of the small risk problem. This is the analysis of countrywide compensation expenses which was compiled by the Pennsylvania Compensation Rating and Inspection Bureau in the summer of this year.

The Pennsylvania study of expenses was initiated because of dissatisfaction with certain Pennsylvania minimum premiums which appeared excessive to some assureds when compared with the inadequate minimum premiums of an adjoining state. The existing Pennsylvania minimum premiums were derived by a formula which prescribed that to the average loss cost per minimum premium risk, loaded by the standard percentage for expense, there should be added a \$10 constant to offset the deficiency in the provision for expenses which would otherwise exist. In order to examine the propriety of the constant used in the minimum premium formula, an experience call was issued by the Pennsylvania Bureau to all compensation carriers operating in

the state. Using countrywide compensation expenses of calendar year 1933 as reported in Pennsylvania Schedule "W", the carriers were requested to segregate from their total administration and payroll audit expenses, those expenses which are directly associated with the number of policies being handled. These expenses may be further defined as those which are independent of the size of the policy premium. To facilitate this division of expense by the carriers, a call for experience was set up in detail and a standard method outlined for treating overhead expense and expense items less susceptible to definite allocation. Carriers were permitted to depart from the standard form if, in their judgment, a different basis for attaining the expressed purpose of the call was better suited to their methods of operation.

To gain a complete understanding of the treatment of expenses proposed in the call, it is necessary to refer to the report blank and accompanying instructions which are reproduced in an appendix to this paper. Briefly the method for dealing with administration expense consisted in first analyzing salaries of departments with definite and limited functions. The ratio of per policy expense to total expense developed by these data was used in splitting other salaries, such as those of general service and supervision. Certain expenses, other than salaries, were likewise treated by dividing them in proportion to the indicated ratio of the first group. Other non-salary expense items were divided according to specified percentages or by percentages which in the judgment or experience of the carrier were more properly related to its individual requirements. In the analysis of administration expense certain items were divided according to the judgment of the carrier as influenced by a special investigation or study of the operations. Payroll audit expenses were segregated practically in entirety on a judgment basis as there appears to be even less uniformity in company practice in handling this work than there is in purely administrative functions. In addition to the breakdown of administration and audit expense, the call provided data from which could be developed an average cost of an inspection of a compensation risk. There was also required the net number of compensation policies (excluding Not Taken policies) issued during calendar year 1933. The intent was to develop an average administration and audit cost per policy by dividing total expenses assignable per policy by the net number of policies

written. This was to be utilized in testing the propriety of the constant incorporated in the minimum premium formula.

Obviously, the cost per policy developed in this way closely approximates in principle the expense constant of the national rate-making procedure as adopted several years ago and in use in the majority of states at the present time. There are two fundamental differences involved in the present study as compared with the original conception and definition of the expense constant. In the first place, the expense constant was set up as the minimum cost of issuing any compensation policy. With a difference of opinion among carriers as to the necessity for introducing the expense constant into the premium basis, this definition produced confusion as to just what constituted the minimum expense of issuing a compensation policy. Some carriers were inclined to regard the minimum cost as of no greater significance than the next-to-the-last straw on the camel's back, while others attached considerably more importance to the minimum cost per policy. The Pennsylvania study has developed a cost per policy which is the average cost of those administration and audit expenses which are independent of risk size. It would appear as though this latter definition possesses advantages over the original conception both as to definiteness and adaptability to expense constant purposes. Another departure from the original conception of the expense constant which is worthy of note is that the cost per policy developed from the Pennsylvania study automatically includes a loading for the expense of Not Taken policies if the average cost is figured by using the net number of policies excluding Not Takens. The expense of Not Taken policies is unavoidable and should be considered as a part of overhead expense and so distributed. Since the expense constant is a definite part of the premium income, the constant should bear its share of this cost. It is doubtful if the original expense constant estimates gave due weight to this source of expense.

The Pennsylvania study is notable as a progressive attempt further to analyze experience with a view to a more equitable allocation and assessment of expenses. Considering the wide difference in types of carriers, classes of business written and methods of operation among the carriers responding to the call, it is remarkable that the results of the final compilation, embracing such a large proportion of the business, are relatively consistent.

The total 1933 compensation earned premiums of carriers whose figures were reported in sufficient detail to be included in the combined data amount to \$106,305,766. This compares with a total of \$111,000,000 of compensation premiums earned in 1933 by carriers operating in Pennsylvania and with \$113,000,000 of compensation earned premiums for the same year of carriers entered in New York State.

Although the division of administration and audit expenses between expenses assignable per policy and other expenses admittedly involved a considerable measure of judgment on the part of individual carriers, the aggregates based on such a large volume of exposure represent at least a dependable consensus of the best judgment of the carriers and are entitled to a reasonable degree of credibility.

The results of the call were reviewed by the Actuarial Committee of the Pennsylvania Bureau. The figures were examined by groups of carriers combined according to their average size of premium, the proportions of per policy expenses to total expenses were compared and the indicated average costs per policy reviewed. The reports of non-participating carriers were studied separately from those of participating carriers. As might be expected in a review of countrywide expense data of stock, mutual and state fund carriers, each with varying distributions of risks both as to size and classifications, there were many differences disclosed in the proportion of expenses assignable per policy. It was concluded that, although the data collected left much to be desired in the way of statistical exactness, the results represented the best evidence thus far available as to the average flat cost per compensation policy for all carriers.

The results of the call in summary form are as follows:

Calendar Year 1933 Countrywide Compensation Earned Premiums of 47 Carriers.....	\$106,305,766
Countrywide Expenses of Administration and Audit as reported in Penna. Schedule W:	
Total Administration	\$ 8,142,147
Total Payroll Audit.....	3,023,308
Net Number of Policies Issued (excl. Not Takens) ..	650,365
Countrywide Expenses Assignable per Policy as reported in Special Call:	
Administration	\$ 3,621,993
Payroll Audit	1,879,233
Average Expense per Policy:	
Administration	\$5.57
Payroll Audit	2.89
	<u>\$8.46</u>
Countrywide Inspection Expenses.....	\$ 2,449,335
Number of Compensation Inspections.....	430,748
Average Cost per Inspection.....	\$5.69

The amounts of average expense per policy developed from these figures compare closely with the provisions for administration and audit expense contained in the basic \$10 expense constant of the national rate-making program.

	Expense Constant	Experience Cost
Administration	\$5.00	\$5.57
Payroll Audit	3.00	2.89
Total	\$8.00*	\$8.46

NOTE: This amount loaded 20% for acquisition costs and taxes results in a gross constant of \$10.

It is apparent that the provisions for administration and audit expense in the standard expense constant are no more than adequate when judged in the light of all carriers' figures. If provision should be made in the expense constant for one inspection every two or three years as some have advocated, it would be necessary to include a half or a third of the average cost of an inspection of a small risk. The average cost of an inspection as reported by the non-participating carriers who write a preponderance of small risks amounted to \$5.25. A reasonable allowance for inspection cost, therefore, might be a third of this figure or \$1.75. If this were added to the \$8.46 cost per policy of administration and payroll audit expense making a total of \$10.21, a gross constant of \$12.76 would be required in order to provide these net amounts after payment of acquisition costs and taxes.

Recently a further analysis of the administration cost returns has been made with a view to reconciling the figures of non-participating and participating carriers. Obviously, if there exists a basic minimum cost of issuing a compensation policy, we should expect to find evidence of a similarity of cost among various carriers and, if parallel characteristics are displayed by the returns of carriers which differ as materially in their basis of operations as non-participating and participating carriers, then it may be concluded that the existence of a fundamental cost per policy has been demonstrated. As a basis for this study, the expenses assignable per policy for individual subdivisions of administration expense were divided by the net number of policies for each group of carriers. This produced the following results according to subdivisions which correspond to the set-up of the basic call.

COMPENSATION EXPENSES PER POLICY

Items of Expense	Average Cost per Policy of Expenses Assignable per Policy	
	Non-Participating	Participating
Underwriting Salaries (incl. Rating, Policy Writing, Index and Proposal File).....	1.53	.97
Statistical Salaries (incl. Risk Experience, Duplicating and Tabulating).....	.56	.56
Accounting Salaries.....	.64	.64
Other Salaries of Special Units.....	.16	.13
Executive Salaries.....	.57	.52
Other Salaries of General Service and Supervision	.37	.37
Travel Expense .....	.19	.21
Rent .....	.71	.38
Furniture and Fixtures.....	.13	.17
Employee Welfare and Insurance.....	.22	.12
Policy Forms and Printing.....	.48	.42
Postage, Express, and Miscellaneous Expense....	.16	.05
Total.....	5.72	4.54
Average Cost per Policy All Companies.....	5.57	

There are only three items which show a proportionately large disparity between the figures of the two groups of carriers. The agreement among the other items is remarkably close. The underwriting expense of the non-participating carriers is materially higher than the corresponding cost of the participating group. A partial explanation of this may lie in the proportion of Not Taken policies which, in the case of the non-participating carriers, is more than double that of the participating group. It may be expected that most of the expense of Not Taken policies is concentrated in underwriting and allied operations. The element of rent is another point at which the participating cost appears to be considerably less. The non-participating companies with their agency connections and close contact with the public usually require central locations at higher rental values than do participating carriers operating without the service of agents and in some instances transacting much of their business by mail. The charge per policy for employee welfare and group insurance also appears to involve a considerable difference. In this connection, it is interesting to note that the charge per policy for insurance (group life, liability, compensation, fidelity, etc.) was practically identical for the two groups and that the other welfare work of the non-participating carriers largely accounts for the difference. With the exception of these few items, there is a

reasonable degree of similarity in the expenses of the two groups of carriers for other items.

It is impossible to analyze in a similar way the returns on payroll audit expense because of the manner in which this was reported in the original call. It is of passing interest to note that, whereas the non-participating payroll audit cost per policy amounted to \$3.11 as compared with \$1.40 for participating carriers, the average cost of an inspection (based on risks of all sizes) was \$5.25 for non-participating carriers as compared with \$7.40 for participating carriers.

In the discussion and study of returns by the Pennsylvania Bureau Actuarial Committee several points were raised tending to discredit the value of the results of the call. For example, it was suggested that for some carriers Pennsylvania Schedule "W" expenses do not correspond with actual compensation disbursements because compensation administration expenses are required by Schedule "W" to be obtained by pro rating total administration expenses in accordance with earned premiums by line. Whereas this contention may be well founded for individual carriers, it appears to lose its force as applied to the aggregate figures of all companies. Another point which was raised is that in the case of carriers writing many lines of insurance, it is difficult to obtain a proper analysis and division of expenses by line of insurance. Here, again, it may be reasoned that differences introduced in the returns of individual carriers from this source are probably well dissipated in the combined figures for all companies. The expense call as issued was designed to tie in with Pennsylvania Schedule "W" expenses. Schedule "W" provides the basis for the expense loading of compensation insurance and, if a departure is made from the standard expense loading of 40%, it is to be expected that justification for the change will be based on Schedule "W" returns.

The Pennsylvania study of expenses constitutes a distinct step forward toward the goal wherein each compensation risk pays its proper share of losses and expenses. The small risk will find a free market for insurance and the incentive for competitive abuse in the underwriting of large risks will disappear with the correction of the maladjustments in existing manual rules and rates. Although much remains to be explored in the field of expense analysis the current study presents clear-cut evidence

that there is a material expense involved with the issuance of any compensation policy. The elements of this cost per policy are reasonably consistent in amount for different types of carriers. In view of these facts the compensation rating structure should be so arranged that, in lieu of assessing all expenses as a percentage of premium, every risk should be charged with an expense constant as part of its contribution toward the expense of administration, payroll audit and possibly inspection. It is hoped that a discussion by the members of this Society of the facts set forth in this paper will lead to a better understanding of the subject and will give impetus to an improvement in rating methods which in the writer's opinion is certain to be recognized ultimately as of vital importance in compensation insurance.

APPENDIX

SPECIAL CALL FOR 1933 INCURRED EXPENSES WORKMEN'S COMPENSATION PENNSYLVANIA COMPENSATION RATING AND INSPECTION BUREAU

Purpose

The structure of Pennsylvania minimum premiums is based on the principle that there exists a basic expense cost per policy which is independent of the exposure to hazard as measured by payroll and rate. Certain elements of administration expense and payroll audit cost are largely the same for each risk and have no relation to the premium size of the individual risk. The present call for expenses is designed to obtain a segregation of these expenses from other administration and payroll audit expenses which are appropriately considered to vary with the amount of premium. The returns of this call are intended to provide a basis for determining a "per policy" cost which will conform to the actual experience of all companies as to administration expenses which are properly assignable on a per policy basis.

Description of the Call

The present call is divided into several parts to facilitate the preparation of the report.

General Items—This call is based on the countrywide writings and expenses of each company and does not require a segregation of the results for Pennsylvania alone. The total amount of expenses for administration and payroll audit combined shown in Column 2 of this report should agree with the amount of general administration expense as reported in the Pennsylvania Special Schedule W—1933, Part I, Item 13.

Part I—Salaries of Units with Limited Functions—The units listed under this part consist of those whose functions are most clearly defined and the expenses of which are most susceptible to a definite separation between expenses assignable on a per policy basis and expenses assignable by premium ratio. In connection with a number of the items in this part, it is intended that the reporting company should make an investigation as to the proper division of expenses inasmuch as company practice varies considerably in the method and expense of these operations. Suggestions for conducting these special investigations are contained in a later section of this memorandum.

Part II—Salaries of General Service and Supervision—These items consist of salaries expended in supervision or in general service to other units. It is recommended that the salaries of Part II be pro-rated between per policy charges and premium ratio charges in accordance with the proportion of these expenses as developed by Part I.

Part III—Administration Expenses Other Than Salaries—It is recommended that certain of these expenses be distributed in proportion to the totals of Part I, whereas other expenses should be dealt with individually.

Part IV—Payroll Audit Salaries and Expenses—The division of expense between per policy charges and premium ratio charges should be made as a result of special investigations conducted by the reporting company.

Part V—Inspection and Accident Prevention Expense—In addition to the amount of this expense the report calls for the number of compensation inspections made during the year 1933 countrywide.

Special Investigations

In Parts I and IV of the attached call, it is recommended that a separation of expenses between amounts which should be allocated on a per policy basis and amounts which should be allocated by premium ratio be determined by special investigation. Special investigations are essential because company practice is not standardized in these operations and the proportions of costs proper for one company may be considerably different than those for other companies. In conducting these special investigations, it is suggested that a detailed study be made of the activities of individual clerks or groups of clerks who are engaged in the operations described. The salary cost of clerks who are working with losses or loss reserves should be assigned entirely to the premium ratio classification. The operations of clerks handling individual premium items or any material connected with individual policies should be studied to determine what proportion of their time is spent on items independent of the size of the premium and the salaries split accordingly. In many companies several of the operations listed in Part I are handled in combination and in such cases it is proper to report these items in combination. In the case of clerks engaged in several operations, it will probably be advantageous to divide the clerk's time first by operation before attempting to make the division between per policy and premium ratio charges. Each company should study its own procedure in order to properly determine the allocation of the expenses between those assignable on a per policy basis and those which vary with the amount of premium.

Preparation of Report and Date of Filing

It is not intended that reporting companies shall be restricted to use the basis of allocation suggested in the attached report provided a different method is more appropriate in the judgment of the company for its own procedure. However, in all cases where a departure is made from the recommended basis of allocation, a description of the method followed should be outlined in a memorandum attached to the filing. This report, completely filled out and attested, should be filed with the Pennsylvania Compensation Rating and Inspection Bureau not later than June 30, 1934.

SPECIAL CALL FOR 1933 INCURRED EXPENSES — WORKMEN'S
COMPENSATION

Pennsylvania Compensation Rating and Inspection Bureau

Report of.....Company

COMBINED REPORTS OF FORTY-SEVEN CARRIERS

General Items:

- (a) Net number of compensation policies, excl. 94859 (No.) Not Taken, issued in 1933 — countrywide..... 650,365
- (b) Compensation countrywide premiums earned in calendar year 1933..... 106,305,766
- (c) Amount of 1933 General Administration Expense (incl. P. R. Audit) from Penna. Schedule W, Part I, Item 13..... 11,166,155

Name and Description of Operations (1)	Total Amount of Expense (2)	Suggested Basis of Allocation (3)	Amount of Expense	
			Per Policy Basis (4)	Prem. Ratio Basis (5)

Part I—Salaries of Units with Limited Functions:

1. Home Office Agency — Preparation of agency contracts and maintenance of agency records.	242,251	100% Premium Ratio		242,251
2. Publicity—Public relations and supervision of advertising.	60,300	100% Premium Ratio		60,300
3. Underwriting — Review of risks, correspondence, etc.	1,145,473	Special Investigation	586,543	558,930
4. Rating—Schedule and experience rating calculations.	200,946	Special Investigation	61,065	139,881
5. Policy Writing—Typing of contracts, endorsements, etc.	186,490	Special Investigation	147,608	38,882
6. Index File—Registry of assureds.	83,948	Special Investigation	68,662	15,286
7. Proposal, Declarations or Application File or Vault.	115,319	Special Investigation	85,622	29,697

SPECIAL CALL FOR 1933 INCURRED EXPENSES — WORKMEN'S
COMPENSATION

Name and Description of Operations (1)	Total Amount of Expense (2)	Suggested Basis of Allocation (3)	Amount of Expense	
			Per Policy Basis (4)	Prem. Ratio Basis (5)

Part I—(Continued)

8. Individual Risk Experience Records — Posting experience — Summaries for underwriters and rating clerks, etc.	235,807	Special Investigation	82,944	152,863
9. Actuarial and Statistical — Bureau calls for experience, state tax records, reserves, etc.	473,760	Special Investigation	184,036	289,724
10. Duplicating and Photostat.	31,855	100% per Policy	27,138	4,717
11. Sorting and Tabulating—Punch cards.	153,941	50% per Policy	70,173	83,768
12. General Accounting—Collections, financial statements, reconciliation of bank accounts, Branch Office and Agency Accounts.	732,483	Special Investigation	418,428	314,055
13. Purchasing and Supply—Incl. distribution.	100,015	75% per Policy	72,495	27,520
14. Legal—Interpretation of contracts, litigation proceedings.	78,832	Prem. Ratio	6,704	72,128
15. External Audit — C. P. A. or stockholders' audit.	39,253	Prem. Ratio	593	38,660
16. Various.	39,007		19,602	19,405
17.				
18. Total Part I:				
(a) Amount	3,919,680		1,831,613	2,088,067
(b) Per cent	100.0	(4) ÷ (2) and (5) ÷ (2)	46.73	53.27

SPECIAL CALL FOR 1933 INCURRED EXPENSES — WORKMEN'S COMPENSATION

Name and Description of Operations (1)	Total Amount of Expense (2)	Suggested Basis of Allocation (3)	Amount of Expense	
			Per Policy Basis (4)	Prem. Ratio Basis (5)

Part II—Salaries of General Service and Supervision:

1. Personnel and Employment.	32,302	For all items in Part II, use Percentages developed in Part I, Item 18 (b)	14,645	17,657
2. Cashier's Dept.—Preparation of Home Office Payrolls, etc.	76,249		36,671	39,578
3. Building employees (not janitors) — Attendants, information desk clerks, library clerks, etc.	25,468	"	11,736	13,732
4. General Stenographic (not policy writing) —Special steno. work outside of routine.	145,143	"	76,532	68,611
5. Mail and General Files—Incl. storeroom clerks, distribution of mail and maintenance of files for records not current.	90,685	"	39,613	51,072
6. Telephone Exchange Operators.	33,888	"	15,135	18,253
7. Directors' Fees.	41,767	"	17,660	24,107
8. General Executive Officers, their clerks and stenographers, incl. Officers not in direct charge of Underwriting Departments.	782,238	"	369,129	413,109
9. Various.	49,723		27,018	22,705
10.				

SPECIAL CALL FOR 1933 INCURRED EXPENSES — WORKMEN'S
COMPENSATION

Name and Description of Operations (1)	Total Amount of Expense (2)	Suggested Basis of Allocation (3)	Amount of Expense	
			Per Policy Basis (4)	Prem. Ratio Basis (5)

Part III—Administration Expenses other than Salaries:

1. Home Office Travel Expense.	256,597	For items 1 to 6 of Part III use percentages developed in Part I Item 18 (b)	124,864	131,733
2. H. O. Rent — Incl. building maintenance.	902,775		437,353	465,422
3. Newspapers, Periodicals and Books.	16,993		8,289	8,704
4. Furniture and Fixtures and Repairs to same—Incl. rent of Tabulating machines, etc.	188,612	"	87,092	101,520
5. Employee Welfare—Medical and Hygiene Disability Benefits, Clubs and Cafeterias.	149,387	"	52,701	96,686
6. Insurance—Premiums for Group, Liability, Compensation, Fidelity and Surety and Fire Insurance (on building contents).	179,573	"	82,403	97,170
7. Postage.	164,829	100% Prem. Ratio	4,326	160,503
8. Telephone and Telegraph Charges.	114,980	100% Prem. Ratio	539	114,441
9. Advertising Costs.	188,034	100% Prem. Ratio	118	187,916

SPECIAL CALL FOR 1933 INCURRED EXPENSES — WORKMEN'S
COMPENSATION

Name and Description of Operations (1)	Total Amount of Expense (2)	Suggested Basis of Allocation (3)	Amount of Expense	
			Per Policy Basis (4)	Prem. Ratio Basis (5)

Part III—(Continued)

10. Express and Freight Charges.	48,032	75% per Policy	21,355	26,677
11. Policy Forms, Print- ing, Office Supplies.	409,287	75% per Policy	305,261	104,026
12. Legal expense (excl. claim expense).	150,005	100% Prem. Ratio	2,809	147,196
13. Various.	177,100		55,131	121,969
14.				
15. Total Administration Salaries and Expenses —Parts I, II and III.	8,142,847		3,621,993	4,520,854

COMPENSATION EXPENSES PER POLICY

SPECIAL CALL FOR 1933 INCURRED EXPENSES — WORKMEN'S
COMPENSATION

Name and Description of Operations (1)	Total Amount of Expense (2)	Suggested Basis of Allocation (3)	Amount of Expense	
			Per Policy Basis (4)	Prem. Ratio Basis (5)

Part IV—Payroll Audit Salaries and Expenses:

1. Home Office Payroll Audit Dept: (a) Salaries.	865,976	Special Investi- gation	512,694	353,282
(b) Rent.	104,529	Follow propor- tions in- dicated for Pt. IV, 1 (a)	60,687	43,842
(c) Travel.	132,561		80,646	51,915
(d) Other Expenses —Incl. Supplies.	63,642		37,605	26,037
2. Field Payroll Audit Dept.: (a) Salaries.	1,298,363	Special Investi- gation	838,174	460,189
(b) Rent.	78,360	Follow propor- tions in- dicated for Pt. IV, 2 (a)	53,084	25,276
(c) Travel.	417,350		259,425	157,925
(d) Other Expenses —Incl. Supplies.	62,527		36,918	25,609
3. Total Payroll Audit Salaries and Expenses —Total of Part IV, 1 and 2.	3,023,308		1,879,233	1,144,075
<i>Total Administration and Payroll Audit Salaries and Expenses—Pt. III (15) + Pt. IV (3).</i>	11,166,155		5,501,226	5,664,929

Part V—Inspection and Accident Prevention:

1. Amount of Inspection and Accident Preven- tion expense from Penna. Sched. W— 1933, Part I, Item (9).	2,449,335
2. Number of compensa- tion inspections coun- trywide made in cal. year 1933.	430,748

(AFFIDAVIT)

THE EXPERIENCE RATING PLAN AS APPLIED TO
WORKMEN'S COMPENSATION RISKS

BY

MARK KORMES

INTRODUCTION

In the early days of compensation insurance it was quickly recognized that the average manual rate would not in general reflect the proper measure of hazard for an individual risk having a substantial exposure.

In order to decrease the loss frequency and severity by eliminating certain causes of accidents, engineers made an extensive study of the manufacturing industries and developed the so-called "Industry Schedule" or a system of credits and charges, depending upon the physical condition of the plant.⁽¹⁾ This system of schedule rating was intended to encourage the employers to install safety devices on their machines and to maintain the plant in a condition which would make it less likely for an accident to occur and reduce the severity of unavoidable accidents.

This initial expression of the idea that, although the manual or average rate reflects the principle of all insurance, that is, the mathematical expectation of loss, nevertheless individual risks should be charged rates below or above such average rate depending upon whether the working conditions of the plant were more or less likely to produce accidents, led to a further question regarding a system of credits and charges for non-manufacturing risks with substantial exposure. Inasmuch as the average rate is predicated upon past experience, and as it was the practice of the underwriters to look at the risk experience when considering its acceptance or rejection, the idea of using the past experience of the risk readily suggested itself and thus the Experience Rating Plan came into existence.

In the early days of compensation insurance several papers were written discussing the rating plan in general or certain of its features. Thus we have the excellent discussion of principles by Woodward,⁽²⁾ the analysis of the results of experience rating

(1) As regards literature on this subject, the reader is referred to numerous papers in the early issues of the *Proceedings*.

(2) "The Experience Rating of Workmen's Compensation Risks", by Joseph H. Woodward, *Proceedings*, Volume II, page 356.

in New York by Senior,⁽³⁾ the mathematical theory underlying credibility by Whitney⁽⁴⁾ and last, but not least, the practical application of credibility by Michelbacher.⁽⁵⁾ These papers were written more than ten years ago, and since that time numerous changes have taken place in the structure of the rating plan and in the rules governing its application.^(5a)

It is the intention of the author to present in this paper as complete a picture of the present status of the Experience Rating Plan as is possible in the frame of the *Proceedings* of this Society. By bringing together the information contained partly in the various rating plans, partly in minutes of Actuarial Committees and partly in memoranda and files of rating bureaus, the paper should provide a long needed and convenient reference on this important subject.

The paper is divided into two parts. The first part gives the historical development and the scope of the plan. In the second part methods of calculating the various elements and tables of the present plan are explained and the technique of experience rating is discussed.^(5b) The paper is not limited to the Experience Rating Plan used by the so-called National Council states and by Massachusetts, New Jersey, New York, etc.; it deals also with the plans used in Ohio, Pennsylvania, West Virginia, etc., though the discussion of these plans is limited because of their local character.

The author is greatly indebted to the Staffs of the National Council on Compensation Insurance, the New York Rating Board, New Jersey, Massachusetts and Pennsylvania Bureaus, the National Bureau of Casualty and Surety Underwriters and the Aetna Life Insurance Company for their help in assembling the material and making numerous suggestions and criticisms.

(3) "The Effect of Schedule and Experience Rating on Workmen's Compensation Risks in New York", by Leon S. Senior, *Proceedings*, Volume I, page 227.

(4) "Theory of Experience Rating", by Albert W. Whitney, *Proceedings*, Volume IV, page 274.

(5) "The Practice of Experience Rating", by G. F. Michelbacher, *Proceedings*, Volume IV, page 293.

(5a) For a comprehensive list of papers and articles on the subject of experience rating see presidential address of Paul Dorweiler, *Proceedings*, Volume XXI, page 1.

(5b) This part is in preparation and the author expects to present it to the Society in May, 1935.

PART I.

HISTORICAL DEVELOPMENT AND SCOPE OF PRESENT PLAN

Early Plans

Even today the first question put by a practical underwriter when considering an individual risk will be "What has been the loss ratio for the past few years?" This question is indeed as old as casualty insurance and even goes further back to the fire and marine business where, when adjusting the premium on risks involving many schedules, the experience of the past has been used as a guide. No wonder, then, that the first experience rating plans were based on loss ratios. There have been several of these plans in existence which, however, with few exceptions, were in effect for a period of one year only.⁽⁶⁾ All of these plans in final analysis were very similar and may briefly be characterized as follows:

(a) *Experience Period*—

Practically every plan provided for a specified minimum and maximum period which included some or all of the experience of the current policy or the policy next preceding the one for which the rating was to be promulgated. The lowest period provided for in one plan was 21 months and the maximum period provided for in the various plans did not exceed five years.

(b) *Qualifications*—

All plans provided some minimum requirements in regard to payroll, premium, or both payroll and premium developed during the experience period.

(c) *Neutral Zone*—

All plans but the original 1915 New York plan⁽⁶⁾ provided a so-called neutral zone, that is, they specified two loss ratios (for example, 40% and 65% in the so-called "Plan A") and all risks whose loss ratio fell between these limits were assigned manual rates. Risks where the loss ratio fell below the lower limit or above the upper limit of the zone were subject to experience rating formulæ.

(d) *Credits and Debits*—

These were calculated in accordance with the following formula (with variations⁽⁶⁾);

$$\frac{r_1 - r}{r_1} \times \text{Maximum Credit} = \text{Percentage of Credit} \quad (1)$$

$$\frac{r - r_2}{100 - r_2} \times \text{Maximum Debit} = \text{Percentage of Debit}^{(7)} \quad (2)$$

where r_1 = The loss ratio representing the lower limit of the zone

r_2 = The loss ratio representing the upper limit of the zone

r = Risk Loss ratio⁽⁸⁾

Maximum credits and debits varied in accordance with the plan, either being given as fixed percentages or calculated by formula.⁽⁶⁾

(e) *Submission of Experience*—

Most plans provided rules for the reporting of experience and the method of valuation of losses.

A very interesting discussion of these plans by Woodward and the critical study of actual results of the original 1915 New York plan by Senior will be found in the early issues of the *Proceedings* of this Society.⁽⁹⁾

1918 Plan and the Basic Principle of Experience Rating

For a number of reasons the plans described in the preceding section proved unsatisfactory. Risks of substantial exposure producing consistently loss ratios of 50% or even less, but within the neutral zone, were being charged manual rates. Small risks where there were no losses or very small losses received credits although the occurrence of a loss was hardly expected in connection with any particular risk having such small exposure. In all the plans the credits or charges were calculated on the basis of loss ratio without due regard to the dependability of the experience; at best was the New York plan where some recognition was given to the size of the risk in that the credits and charges were

(6) See Appendix I for details of the various plans and a chart showing the states where applicable and the period during which effective.

(7) If risk loss ratio was 100% or more, maximum debit applied.

(8) The notation in this paper is based wherever practicable on Mr. Carlson's "Suggestions for a Standard System of Notation in Casualty Actuarial Work", *Proceedings*, Volume XX, page 264.

(9) loc. cit.

graduated for risks up to \$5,000. Furthermore, a large number of tests had to be made for such risks as fell into the neutral zone, thus adding a great deal to the administrative cost. Objections to the plan were raised by supervisory authorities and the problem was given thorough study by a special committee⁽¹⁰⁾ with the object of evolving a plan free from the objectionable features and providing for a more uniform and equitable treatment of the experience of individual risks. The work of the committee was very fruitful and the principles of the plan evolved are the principles underlying the present Experience Rating Plan.

This plan which we may term the 1918 Plan⁽¹¹⁾ introduced for the first time the concept of credibility as a function of risk hazard and exposure. The plans previously in effect attempted to limit the departure of experience on individual risks from the class average by artificial means, like a neutral zone and maximum credits and charges. The new plan announced that it is not enough merely to measure the departures of the risk experience from the average, but it is also necessary to examine what degree of dependability is to be placed on the indications of the departures produced by the experience of the particular risk under consideration. The theory of this measure of dependability or so-called credibility has been very ably set forth by Whitney⁽¹²⁾ and the practical considerations leading to the final adoption of the various phases of the plan are discussed in great detail by Michelbacher.⁽¹³⁾ The reader who wishes to have a deeper insight into the basic principles underlying experience rating of individual risks is seriously urged to acquaint himself with the contents of the above mentioned contributions to these *Proceedings* as it is not within the scope of this paper to enter into the discussion of the theoretical principles underlying experience rating and neither is it the intention of the author to repeat anything previously presented to the Society unless it is essential for the sake of continuity and clarity.

The features of the 1918 Plan, or Plan D as it was called in the

(10) This was the "National Council Reference Committee on Workmen's Compensation Insurance", the actuarial section of which consisted of W. W. Green, Chairman, B. D. Flynn, G. D. Moore, A. H. Mowbray and J. H. Woodward.

(11) It became effective in the majority of compensation states during 1918. For further details see chart and Appendix I.

(12) loc. cit.

(13) loc. cit.

National Workmen's Compensation Service Bureau states, may be briefly described as follows:

(a) *Experience Period*—

A minimum of 21 months and a maximum of 45 months was provided, the experience to be brought down to and valued as of a date three months prior to the effective date of the rating. Later this requirement was changed to provide a minimum of 18 months and a maximum of 42 months, the experience to be brought down to six months and valued as of three months prior to the effective date of renewal insurance.

(b) *Qualifications*—

The payrolls during the last 21 months (later amended to 18 months) of the experience period extended at latest manual rates had to produce at least \$500 of premium (coincident with the reduction of the period to 18 months the premium requirement was reduced to \$450). In certain states the requirements were somewhat different.

(c) *Use of Experience*—

The following rules governing the reporting and use of experience were provided:

1. The actual payroll for each classification shall be tabulated by year of issue for the experience period. The plan contemplates a special audit as of ninety (90) days (later six months) prior to the effective date of the renewal policy and the inclusion in the rating of the experience of nine (or six) months of the current policy.
2. "Premium subject to experience rating" shall be computed by extending actual payrolls by manual rates or schedule rates for classifications subject to schedule rating.
3. Incurred losses to be reported by year of issue in the following divisions:
 - I—Death and Permanent Total Cases.
 - II—Indemnity Losses arising from Permanent Partial and Temporary Total Cases.
 - III—*Actual Payments* on account of Medical Aid.
4. A catastrophe was defined as a single accident involving at least five deaths or permanent total disability cases and costing in excess of a certain fixed amount. Such fixed amount was considered the normal cost of a catastrophe and was the only portion of a catastrophe loss used for rating purposes.

(d) *The Method of Experience Rating—*

The plan required the division of the premium subject into two parts, first, Death and Permanent Total Disability which corresponded to the expected loss because of the occurrence of death or permanent total disability, and second, "All Other" corresponding to the expected losses because of injuries resulting in permanent partial, temporary total disability and payments for medical aid. Each of these two divisions was separately rated. The subject premium was split into two divisions in accordance with Table "B" which provided the percentages of premium corresponding to the D. & P. T. D. and "All Other" division wherein the split varied by size of rate and was entered with the risk's average rate. The incurred losses were brought to the level of premiums by means of modification factors shown in Table "A" separately for indemnity and medical losses. These modification factors included not only law and rate level changes but contained also the expense loading. The following New York Table "A" effective June 30, 1918 may serve as an illustration:

Policy Year	"All Other" and D. & P. T. D.	Medical
1914	2.34	2.34
1915	2.11	2.07
1916	1.81	1.95
1917	1.86	2.15
1918	1.86	2.15

Having thus attuned the "subject premium" and the incurred losses the computation of the experience modification was carried out separately for each of the two divisions. The adjusted premium for the D. & P. T. D. division or x_1 was determined by the formula:

$$x_1 = P_1 + z_1 (p_1 - P_1)$$

where $P_1 =$ D. & P. T. D. division of premium subject

$p_1 =$ D. & P. T. D. division of adjusted loss or indicated premium

$$z_1 = \frac{P_1}{P_1 + K_1}$$

The constant K_1 varied by state and was developed on the basis of judgment.⁽¹⁴⁾ The expression $(p_1 - P_1)$ or the "indicated

(14) For details relative to the determination of "K" values, see Michelbacher loc. cit.

departure" when modified by z_1 or credibility became the "allowable departure" by which the subject premium for D. & P. T. D. could be modified. Similarly, for the "All Other" division the adjusted premium or x_2 was obtained from the formula:

$$x_2 = P_2 + z_2 (p_2 - P_2)$$

where the meaning of the various symbols was exactly the same as above with the substitution of "All Other" for D. & P. T. D. and where

$$z_2 = \frac{P_2}{P_2 + K_2}$$

A different constant K_2 applied for this division. The final experience modification,⁽¹⁵⁾ M , was then obtained from the formula:

$$\begin{aligned} M &= \frac{(P_1 + P_2) - (x_1 + x_2)}{P_1 + P_2} \\ &= \frac{\text{Total Premium Subject} - \text{Total Adjusted Premium}}{\text{Total Premium Subject}} \end{aligned}$$

The final modification expressed as a percentage was then applied to the manual or schedule rates.⁽¹⁵⁾

In certain classifications involving considerable catastrophe hazard the specific catastrophe elements of the rates were excluded from experience rating. (In New York after March 5, 1919 such classifications themselves were excluded from rating). A list of such classifications appeared on the so-called Table "C". The experience modification calculated for the risk applied, however, to the full rate (except in New York).

The above plan was issued and supervised by the National Workmen's Compensation Bureau (now the National Bureau of Casualty and Surety Underwriters). New Jersey, New York and Massachusetts had had separate plans printed although they were identical in major principles and the rating of risks in these states was supervised by their independent bureaus. Pennsylvania also issued a separate plan which in principle of credibility determination somewhat resembled the above. There were important differences in the loss division, whereby the more serious cases (all permanent partial and serious indeterminate cases) fell into the D. & P. T. division; in the loss modification, whereby average values for fatalities and tabular values for indeterminate

⁽¹⁵⁾ Modification is used here in the sense of credit or debit.

cases were used, and the calculations were carried out with the use of pure premiums.⁽¹⁶⁾

The Organization of the National Council on Compensation Insurance and the 1920 Experience Rating Plan

Coincident with the organization of the National Council on Compensation Insurance, the 1918 Plan was revised in several details although its general structure remained the same. The principal points of departure were as follows:

- (a) For classifications in Table "C" a provision was made whereby the final rate was determined by adding the catastrophe portion of the full rate to the modified remainder of the rate.
- (b) Provision was inserted for the reporting of the allowance granted individual risks for maintenance of a hospital by requiring to submit together with medical losses certain percentages of the medical allowance incurred.
- (c) A modification was made in the credibility formula for the "All Other" division as follows:

$$z_2 = \frac{P_2 + C}{P_2 + K + C} \quad (17)$$

- (d) For risks developing a manual or a subject premium of \$80,000 or more, credibility of unity was used. (Since this plan of self-rating was not adopted in many important states the discussion of self-rating will be found in connection with the 1923-1928 Plan).
- (e) A change was made in Table "B" in that it provided merely the D. & P. T. D. portion of the rate which was calculated separately for each classification.

The above revision of the 1918 Plan was issued by the National Council on Compensation Insurance and supervised by that organization and by the National Bureau of Casualty and Surety Underwriters in their respective jurisdictions. A similar plan was separately printed in New York and California which was almost identical except for several features of the California Plan.⁽¹⁸⁾

⁽¹⁶⁾ See chart in Appendix I for effective dates and period of application in various states.

⁽¹⁷⁾ The introduction of the constant "C" was prompted by an attempt to correct for certain deficiencies in the practical results of the plan but it was found that this empirical formula did not produce the desired results and it was later abolished in favor of the normal and excess split plan. (See chapter dealing with the 1923—Present Plan).

⁽¹⁸⁾ For further details see Appendix I.

1923 Plan — 1928 Plan — Present Plan⁽¹⁹⁾

The revision of the plan which became effective in 1923 altered the structure of the plan considerably and since that time there have been no really important changes made in the plan, so that we may consider the 1928 Experience Rating Plan and the present Experience Rating Plan as a modified 1923 Plan. The various present features of these plans will be described in much more detail than heretofore and occasional departures will be made from the so-called National Council Plan to cover variations in several important independent cooperating states.

(a) Definitions—

The plan starts with definitions of several terms used in the plan. Thus, "Risk" is construed to include all operations of any one assured within the state regardless of whether such operations or any part of them are subject to schedule rating or are insured by one or several insurance carriers. "Manual Rates" are defined as the rates printed in the Manual in force on the effective date for which adjusted rates are to be determined. "Schedule Rates" shall mean the schedule rates established in accordance with the latest inspection report and on the basis of manual rates as defined hereinbefore.⁽²⁰⁾ "Adjusted Rates" are defined as rates obtained by applying the experience modification to the manual rates for classifications not subject to schedule rating and to schedule rates for classifications subject thereto.⁽²⁰⁾

(b) Qualifications—

The plan requires that the application of manual rates to the total payroll for either the latest year or the two latest years of the experience period for which experience is available, must result in a premium of not less than \$1,000 and that no risk shall be rated upon less than one year's experience. The important departures from this rule will be found in Massachusetts

⁽¹⁹⁾ In this connection see also paper by W. F. Roeber entitled "Recent Developments in Workmen's Compensation Rate Making", *Proceedings*, Volume XX, p. 223.

⁽²⁰⁾ Recently schedule rating has been abolished in most of the states with the exception of California, Kansas, New Jersey, New York, Texas, Utah, Virginia and Wisconsin. Because of the large premium volume in these states, the author feels that a discussion of the schedule rate as it enters the Experience Rating Plan must be retained in this description.

where the minimum amount required is \$700; in New Jersey where the requirement is modified to require an average annual premium for the experience period of at least \$500 or \$1,000 in latest year or two years, and in New York where the application of manual rates to the payrolls during the experience period shall result in a premium of not less than \$2,000 or an average annual premium of at least \$500 for the last two or more years of the experience period.⁽²¹⁾

(c) *Experience Period*—

The experience period shall not be less than one year and not more than five years commencing six years prior and terminating one year prior to the date on which adjusted rates are to be established.^(21a) Completed policy periods only shall be used. An exception to this rule is made in the case where the policy periods during the history of the risk have not been for full annual terms and where the risk involves two or more policies, varying in expiration date. In the first case, the earliest policy period, part of which lies outside of the normal five-year maximum period, shall be retained in full, provided the entire experience period does not exceed five and one-half years, and shall be rejected in full if its retention would increase the maximum experience period beyond five and one-half years. In the second instance, the experience period shall be determined for each policy separately, but there is established a so-called normal rating anniversary date and the experience period for each policy shall close

(21) Requirements for New York given above are the present requirements. They have been considerably less in the past, starting with \$300 and then gradually increased coincident with the rise in the level of manual rates. Other departures in the present requirements are as follows:

California—Manual premium for the latest year, 2 years or 3 years not less than \$1,000.

Kansas—Manual premium for the latest 2 years not less than \$600.

Minnesota—Manual premium for the latest year or 2 years not less than \$600.

Texas—Manual premium for the latest year or 2 years not less than \$600.

Virginia—Manual premium for the latest year or two years of \$600 or average premium of \$300 per year for the experience period if more than 2 years available subject to a minimum of \$600.

Wisconsin—Manual premium for the latest year or 2 years of not less than \$800.

(21a) Exceptions will be found in New York and Texas where the maximum experience period is four years.

with the completed policy period terminating not less than six months prior to the rating anniversary date. For example, if the rating anniversary is January 1, 1935 and there are three other policies expiring March 1, 1934, June 30, 1934 and October 1, 1934, the experience of the policy expiring October 1, 1934 will not be used for the rating effective January 1, 1935. An important departure from this rule will be found in New York where instead of five years, the period of four years is required with similar provisions in case of short term policies or multiple policy risks.

(d) *Experience To Be Used—*

The entire experience of the risk incurred within the experience period must be reported and used in determining adjusted rates. The supervising Bureau may, in its discretion, verify any or all of the data from which the experience modification is to be determined. It should be pointed out here that in several states, including Georgia, Massachusetts, New York, North Carolina and Virginia, there exists at the present time the so-called unit system of reporting.⁽²²⁾ Under this system, experience on individual policies is reported in considerable detail and the information so submitted is used for experience rating purposes. In the remaining states the experience is submitted on blanks which are discussed in a later portion of the paper.

Experience data from non-member carriers or from carriers that have discontinued business are accepted only if subject to verification and after removal of all doubt as to the accuracy and completeness of information. In some states, as in New York and New Jersey, if the experience data are not available for part of the period because of the fact that the carrier has discontinued business, the experience for such period is considered neutral. In New York the present carrier is required to make a payroll audit for the period not available, whereas in New Jersey a pro rata basis of determining the payroll for such period is used.

(22) See paper by Charles M. Graham, *Proceedings*, Volume XVII, page 191, and Mark Kormes, *Proceedings*, Volume XVIII, page 262, as well as the written discussions by Messrs. Marshall, Skelding and Magoun dealing with the Georgia, Massachusetts, North Carolina and New York Unit Statistical Plans. In Pennsylvania there is also a special detail system of reporting the experience.

Experience of self-insurers may be accepted by the supervising Bureau, provided the application is submitted on an approved form giving definite information with respect to payrolls and losses and such statement is verified by an affidavit of the employer. In New York the acceptance of self-insurers' data is subject to the approval of the Classification and Rating Committee. In Massachusetts the experience of self-insurers is not acceptable.

Where a contractor performs a construction job on a cost plus basis and a policy is issued to cover the insurable interest of both the contractor and the principal, the experience of the contractor shall govern the rate to be specified in the policy and the experience incurred under such policy shall be considered as the experience of the contractor.

(e) Use of Past Experience and Combination of Risks for Rating Purposes—

The rules contained in these sections of the plan deal with definitions and requirements which must be met by a particular employer in order to qualify for experience rating. The purpose of the Experience Rating Plan is to determine an indication for the future on the basis of the past, and the rules of the plan had to be very carefully worded and revised from time to time in order to meet conditions brought about by changes in legal character of the ownership of the risk. In the practical application of the plan it was found that risks with experience which would produce charges were tempted to escape such charges, and could accomplish this by establishing new legal entities which could be described as new risks and which, to all outward appearances, had nothing in common with the previous risk. For this reason it was very important and absolutely necessary to have very careful and all-embracing definitions in the rating plan in order to prevent the misapplication of the experience rating principles and to assure the application of the experience modification to risks substantially under the same ownership and management. The rules in the National Council Experience Rating Plan are rather simple. They are amplified below by various additions and amendments which are found in the New York Plan, the latter being the most elaborate on account of having

had to deal with peculiar business conditions prevailing in that state.

The National Council Plan first defines separate risks as those corresponding to the operations of separate legal entities whereby the term "legal entity" is also interpreted to include copartnerships or unincorporated associations. In the determination of adjusted rates the experience incurred on all operations of a risk shall be used regardless of any change in ownership, control or management except upon the acquisition of the entire assets and good will:

- (a) Through purchase or inheritance by a new individual owner not previously identified with the management of the retiring establishment.
- (b) Through purchase by a newly formed copartnership, the majority interest of which is held by a new owner not previously identified with the retiring establishment.
- (c) Through purchase by a newly formed corporation of new owners who have elected a board of directors and the majority of whom were not individual owners, partners or directors of the retiring establishment.

If any of the above conditions are fulfilled the past experience of the risk is not to be used for the determination of the experience modification for the new owners. This is based on the theory that the new management has in no way contributed to the good or bad experience of the risk it acquired. When an establishment sells a part of its assets but continues to operate its business, all experience incurred prior to the sale must be used in connection with future ratings of the risk.

A combination of risks for rating purposes is permitted when several establishments are merged or consolidated either by means of a new corporation or copartnership formed for the purpose of perfecting the merger or by the purchase of the entire assets and good will of several separate legal entities by an *existing* establishment.

In general, the plan prohibits the combination of two or more *separate risks* for experience rating purposes except that it requires the combination of two or more *corporations* for rating purposes provided that one of the corporations holds a majority interest in and exercises an active control of and directs the management of the other corporation or corporations. Holding com-

panies organized primarily for holding the stock of a subsidiary corporation or corporations cannot have the experience of the several units combined.

In New York the above rule is extended in that it requires that one of the corporations should hold a substantially complete interest⁽²³⁾ rather than a majority interest.

Furthermore, the New York Plan has a special rule relative to the operation of real estate. This rule provides that the experience developed in the administration of real property by an employer who holds legal title to such property, or by his agent, shall be used in establishing the experience modification for the employer. Experience developed, however, in the administration of real property by a banking corporation or other institution acting in a fiduciary capacity or through its agents, shall be included with the experience derived from all operations conducted by such a corporation in establishing the modification for this corporation and for the estates under its supervision. Mortgagees in possession, receivers or assignees of rent are regarded as employers in this rule unless the instrument giving possession or assigning rents limits their authority to the collection of rents only.

The establishment of the last rule is of recent origin. The previous rule provided that all experience developed under the administration of real property by an agent or trustee who stands in the position of an employer in the hire and discharge of labor shall be combined for experience rating purposes. This rule was found not only impossible to administer but of questionable legality. The Board was never certain that it had all the experience of such an agent or trustee. A separate policy is usually issued covering each owner and/or agent, and it would be to the advantage of the managing agent to seek a combination of experience only on those properties managed by him where the compensation experience is favorable. Extensive correspondence had to be conducted in each case relative to the relation of the agent to the employees with no guarantee as to the accuracy of the answers. Awards have been made against owners on the theory that the agent is simply a manager for the owner and the owner is primarily responsible for injury to an employee. On

⁽²³⁾ The ownership of 51% of stock is by no means considered as substantially complete interest by the New York Rating Board and a considerably higher percentage of share ownership is required.

the other hand, very bad experience incurred at one location under such rule would have to be imposed against owners of other buildings managed by the same agent the former, naturally, objecting to such imposition. In view of these difficulties it was decided to amend the rule to the effect that the experience should follow the owner rather than the agent. In the case of banks and trust companies which frequently are regarded as in the position of principal, it is permissible to use all of the experience of the bank, including not only its banking operations but also its operations connected with the administration of real property as trustee, mortgagee in possession, assignee of rents, etc. In such instances, were it in order to promulgate separate ratings for various owners, it would be necessary to issue hundreds of policies covering the various fiduciary relationships of the bank or trust company.⁽²⁴⁾

The ever-changing business conditions will, undoubtedly, require further modification of these rules and it is very desirable that the rating plan as a part of the rate structure should reflect such changes.

(f) *Experience Modification*—

The plan provides for the establishment of a single modification for a given risk at one and the same time. Such modification once developed is to be applied to all the operations of the risk regardless of whether the operations of the risk remain the same or are assigned to new classifications because of a change in the operations or undertaking of new operations by the assured.

The plan further provides that it shall not be permissible to alter an existing contract by cancellation or rewriting or the extension of the policy for the purpose of enabling the risk to qualify under the plan, the intent of the plan being to experience rate only on the normal expiration date. For risks having several locations covered by different policies which differ as to expiration date, a special method is provided whereby a so-called anniversary rating date is established and a single modification promulgated on the anniversary date is applicable to all policies out-

(24) In this connection the reader is referred to a paper on this subject by Senior entitled "Experience Rating in *Rem* and in *Personam*", *Proceedings*, Volume XI, page 211.

standing or issued during the ensuing twelve months until the next anniversary date.

In the states where schedule rating applies it is further provided that if schedule rates are revised during the policy term because of interim surveys the existing experience modification will be applicable to the new schedule rates for the remainder of the policy term.

(g) *Provisions for Reporting and Tabulating Experience—*

As already indicated above, in a number of states the experience on every single policy is submitted to the supervising rating organization, which experience is then utilized for the purpose of experience rating. Effective with policy year 1935, about 17 additional states coming within the jurisdiction of the National Council will be also subject to a similar unit reporting plan. For the remaining states the following provisions as regards the reporting of the experience are given, which provisions, on the whole, coincide with the information available from the reports under the unit plan system.

The plan being compulsory, the carriers are required to submit an application for experience rating showing the entire data for such portion of the experience period as was covered by the applicant carrier. Where the applicant carrier is not in the possession of the complete record of the experience for the period, the additional data must be secured by the supervising board or bureau from previous carriers of the risk.

The plan provides for the submission of the experience on special blanks, separate and distinct blanks being used for policies excluding medical aid. These blanks provide for the reporting of actual audited payrolls for each classification by policy years during the experience period. In states where schedule rating is still used, a separation of payrolls must be made wherever parts of payrolls under the same classification are subject to different schedule modifications.

The valuation of outstanding losses must be made in the light of all available information as of not more than six nor less than four months prior to the rating date of renewal insurance. For open cases, that is, cases for which final compensation payment

has not been made, a separate report on a prescribed form is required.

In New York the valuation of outstanding losses is to be made as of exactly six months prior to the rating date of renewal insurance. This provision was made in order to eliminate complications in connection with the submission of revised unit reports because of changes in the status of a number of cases which develop in the period between six and four months prior to the rating date of renewal insurance.

The plan provides for the submission of the incurred loss experience in the following divisions:

- (a) Each loss must be examined as to whether it exceeds the so-called normal value as shown in Table "A" for each policy year.
- (b) All indemnity and medical losses other than Death and Permanent Total cases, cases involving costs in excess of the normal value and all open cases, are summarized by year of issue separately for indemnity and medical.
- (c) Cases involving excess indemnity or excess medical cost, Death and Permanent Total Disability and all open cases, must be listed individually giving the year of issue, claim number, date of accident, brief description of nature and extent of injury, and a statement whether they are open or closed and must show a separation of indemnity and medical losses for each claim into normal and excess portions.

For the purpose of rating, all Death and Permanent Total cases are reportable on an average value basis specified in Table "A" for each policy year.⁽²⁵⁾

The above provisions contain the main difference between the 1923 plan and the 1920 plan, namely: in the 1920 plan the losses were divided into two groups, the first composed of death and permanent total disability losses and the second of "All Other" losses, whereas in the 1923 plan the losses are split into so-called normal and excess portions. The normal indemnity loss is defined as the cost of 50 weeks compensation at the maximum weekly rate of compensation. Thus, for example, in New York we would have $50 \times \$25$ or \$1,250. The normal medical cost was set at \$100. These values are rather arbitrary but the division of losses in this manner has proved much more equitable than under

(25) In New Hampshire there is no split between indemnity and medical losses for the purpose of experience rating.

the previous plans. It should be noted that in New York for a number of years much higher values were provided for normal costs, the indemnity normal cost being set at \$2,000 and the normal medical cost at \$200.

Catastrophes are defined as accidents involving injuries to two or more persons and the plan provides that each of the claims chargeable to such accidents shall be split separately into normal and excess portions. The normal portion of the indemnity loss is limited for rating purposes to twice the normal amount per case specified in Table "A" and the remainder of the normal portion together with the excess portion is to be included in the rating as excess, subject, however, to a limit equal to twice the excess value specified in Table "A". The normal portion of the medical loss is limited to twice the normal amount per case as shown in Table "A" and the remainder of the total medical loss must be included as excess subject to a limit equal to twice the value for excess indemnity shown in Table "A".

Where the carrier makes an allowance for the maintenance of the plant hospital, the amount of such allowance for a given policy year must be reported in full as normal medical losses, and where the carrier loans equipment to plant hospitals operated by the assured, 10% of the value of the loaned equipment shall be reported each year as normal medical losses. Where a contract has been entered into by the carrier for medical and/or hospital services covering several risks, the amount of such medical cost shall be reported for a given risk on a pro rata share of the total contract price based upon the number of treatments.

The plan does not permit the exclusion from the experience of any losses on the ground that the employer was not morally responsible for the accident causing such loss.

The above rule is further elaborated upon in New York in the following fashion:

"Where negligence suits have been instituted by claimants against third parties, the procedure shall be as follows: Include in the experience application all accident reports for valuation purposes regardless of whether a claimant in any particular case has instituted a suit for negligence against a third party, because failure to recover against a third party is no bar to compensation and the insurance carrier may eventually be obliged to indemnify the claimant in whole or in part for the loss sustained.

In those cases where there may be good reason to believe that

the claimant will obtain full recovery against the third party and the insurance carrier saved harmless from any loss, the question as to whether the accident is to be included for experience valuation, together with a detailed statement of facts giving the nature of the injury and the circumstances under which it has been incurred, may be presented as part of the application for experience rating for review and decision by the Board."

Where the carrier receives reimbursement under subrogation rights, the treatment provided by the plan is as follows:

"In the case of accidents, other than those involving death and permanent total disabilities, only the net loss shall be reported, provided, however, that where the entire loss on any case is recovered, the case shall not be included in the rating. In the case of accidents involving death or permanent total disability, the full loss and the subsequent recovery shall be reported and the amount of loss included for experience rating purposes shall be such proportion of the average value as the net loss bears to the total loss."

(h) Rating Procedure—

The plan provides for decreasing weights which are applicable to both the payrolls and the losses of the respective policy years beginning with the latest and ending with the earliest year of the experience period. These weights which are 1.0, 1.0, .8, .6 and .4 are included in the payroll and loss modification factors shown in Table "A". In New York, where four years are used, the weights are 1.00, .75, .50 and .25 respectively. Where the experience period extends over the usual five years, as may be the case in connection with policies not written for full annual terms and multiple policy risks, the earliest policy year is assigned a weight of .20. The calculation of the total weighted subject premium needed for the determination of expected losses is accomplished by extending the modified payrolls at manual rates for classifications not subject to rating and appropriate schedule rates for classifications subject to schedule rating in states where schedule rating applies. In this calculation the premium accruing from the \$.01 catastrophe loading contained in the rates is excluded from the weighted subject premium. The weighted subject premium as calculated above is split as between normal and excess by classifications on the basis of excess ratios shown for each classification in Table "B".

Credibility is determined on the basis of unweighted subject premium which is calculated from the weighted subject premium by applying to it the ratio of the total unweighted payrolls to the corresponding total modified payrolls. Separate credibility is assignable to normal and excess portions and the credibility values corresponding to given normal and excess premiums subject are shown in Table "E". Table "E" is constructed on the basis of the following formulæ:

$$Z_n = \frac{P_n}{P_n + K_n} \text{ and } Z_e = \frac{P_e}{P_e + K_e}$$

where Z stands for credibility, P for unweighted subject premium, K for credibility constant and the subscripts n and e refer to normal and excess respectively. The K values are so determined that for a risk producing an unweighted subject premium of \$1,000 the maximum average charge resulting from a single claim shall not exceed 20% on an average premium split basis and the maximum charge from a single claim which does not exceed 50 weeks indemnity at the maximum weekly amount and \$100 medical cost, shall not exceed 15%.

The adjusted losses are determined separately for normal and excess in accordance with the following formulæ:

$$L_n = A_n Z_n + E_n(1 - Z_n)$$

$$L_e = A_e Z_e + E_e(1 - Z_e)$$

where L_n = Adjusted Normal Losses

L_e = Adjusted Excess Losses

E_n = Expected Normal Losses

E_e = Expected Excess Losses

A_n = Modified Actual Normal Losses

A_e = Modified Actual Excess Losses

It should be noted that these formulæ are identical with the following formulæ as can be found simply by multiplying out the terms in the parenthesis and arranging them in a different manner:

$$L_n = E_n + Z_n (A_n - E_n)$$

$$L_e = E_e + Z_e (A_e - E_e)$$

which, in words, are the familiar formulæ for adjusted losses, namely:

Adjusted Losses = Expected Losses + Allowable Departure.

The formulæ as shown above correspond to the arrangement of

the calculations on the experience rating blank. Such arrangement was adopted because it saves a considerable amount of space and labor. The final modification for the risk is calculated from the formulæ:

$$M = \frac{L - E}{E}$$

where $L = L_n + L_o$
 $E = E_n + E_o$

The modification as calculated above is then applied to the manual rate or schedule rate if classification is subject to schedule rating for the purpose of determining the final adjusted rate for each individual classification.

The rating procedure as outlined above represents a product of several stages of development, the most important ones having taken place in 1928. The principal changes, namely, the introduction of weights and the amendment of the self-rating plan deserve special consideration.

The idea of assigning lesser weights to early experience and greater weights to more recent experience was discussed for a long time before it was adopted. The Actuarial Committees considered a number of methods of weighting before adopting the weights now in almost general use.⁽²⁶⁾ The weighted plan is more sensitive to reflect the difference between a risk which is improving and one which is deteriorating, as it decreases credits or increases charges for bad experience and increases credits or reduces charges for good experience if such experience developed in the latest portion of the experience period. On the other hand, it undoubtedly tends to produce greater fluctuation in risk rates from year to year and introduces a slight complication into the rating procedure.

The credibility values determined from the formulæ described above produce satisfactory results for risks with small or medium premium volume. For very large risks, however, it was found that the experience modification was never sufficient to produce a normal loss ratio over a period of years. To remedy this situation it was originally decided in many states arbitrarily to assign full credibility to risks which during the experience

(26) The weighted plan, thus far, has not been adopted in New Jersey, Texas and Virginia.

period have produced \$80,000 of premium subject (1920 Plan). This provision was later amended to require either a total adjusted loss of \$60,000 or a total premium subject of \$100,000 or more. This method of self-rating which produced a sharp line of demarcation at a self-rating point, was thought of as a practical solution but its actual application was found difficult to justify and to explain both to the public and the supervisory authorities. Minnesota, Wisconsin and, later, New York have adopted a self-rating plan which provides that the point of self-rating shall be reached by a gradual process. This is accomplished by drawing a straight line from the point of self-rating to another point on the credibility curve selected arbitrarily, this procedure being applied separately for normal and excess credibility. The credibility criteria established in the general rate revision for 100% local credibility⁽²⁷⁾ on classification rates were split as between normal and excess on the basis of the average premium splits calculated for experience rating purposes.⁽²⁸⁾ 50% of the normal criteria and 90% of the excess criteria, both in terms of the premium, were then established as the respective points of self-rating. The points of departure from the credibility curve were taken as one-half the amount of premium necessary for self-rating.

This method was incorporated in the National Council Plan and later it was decided to adopt fixed amounts for normal and excess subject premiums at the point of self-rating so as to avoid minor fluctuations every time there was a change made in the credibility criteria or in the rate level. Although infinitely superior to the original abrupt jump in credibility at a certain point, it did not completely satisfy the fastidious actuary, and finally for the states under the supervision of the National Council, the straight line from the point of self-rating was made tangent to the credibility curve. This refinement has not been adopted in New York where the method of connecting by a straight line the point of self-rating with the point corresponding to one-half the amount of self-rating is still used.⁽²⁹⁾

(27) For further details see paper by W. W. Greene and W. F. Roeber entitled "The Permanent Ratemaking Method Adopted by the National Council on Compensation Insurance", *Proceedings*, Volume XII, page 253.

(28) For details of these calculations the reader is referred to the second part of this paper.

(29) For the mathematical derivation of the coordinates of the point of tangency, see Appendix II.

As regards the Z values themselves it may be well to point out that originally such values were calculated for each risk from the actual formula. In order to reduce the considerable amount of labor involved and also to eliminate the possibilities of error because of unfamiliarity with algebraic formulæ on the part of average clerks, Table "E" has been introduced where the Z values are shown in intervals of one-half of 1%. The premiums shown opposite a given Z value represent a limit of the premium amounts which will produce the given Z value. Thus having determined the premium subject (normal and excess) it is sufficient to look up in Table "E" the amounts between which such premium falls; the Z value opposite the larger of the two amounts shown in the table represents the Z value to be used in the rating. The credibility is based on the unweighted premium which in the rating procedure is accomplished by applying to the weighted premium subject a factor which represents a ratio of the total unweighted payrolls to the total weighted payrolls. This method introduces a slight inaccuracy for risks with an uneven distribution of payrolls, which, however, seems justifiable in view of the more or less arbitrary character of credibility and the considerable economy in the rating procedure.

(i) *Risks Involving Catastrophe Hazard*—

For a number of years the plan contained a list of classifications which were subject to a special procedure because of the fact that they were considered to contain a substantial catastrophe hazard. Table "C" where such classifications were listed showed the proportion of the rate which had to be excluded from the rating procedure and subsequently added to the modified rates. This special procedure has been recently abolished.⁽³⁰⁾

(j) *Rating of Stevedoring and Vessel Classifications*—

Prior to the introduction of the Federal Longshoremen's and Harborworkers' Act, stevedoring and vessel risks were written either under Coverage I, which is a form of Employers' Liability insurance, or under Coverage II which is a form of voluntary compensation insurance. Since the introduction of the Federal

⁽³⁰⁾ Retained in Texas.

Act relative to longshoremen and harborworkers, the two groups of risks are being separately rated.

The difference from the standard rating procedure so far as the classifications subject to the U. S. Longshoremen's and Harbor Workers' Act are concerned, consists in different average values for death and permanent total cases. Otherwise, the rating procedure is exactly the same as that for the classifications under the State Act.

As regards vessel classifications the rating of such classifications is done in exactly the same manner as the rating of all other classifications, except that the plan does not provide any average death and permanent total values but provides only maximum indemnity values for any single case (except in Virginia, where the average death and permanent total values are used).

(k) *Interstate Rating*—

Although interstate rating was abolished July 1, 1932, it is proper to describe briefly this form of rating which had been in use for some time. Since, in a number of states, there was no restriction as to the use of experience of other states for experience rating purposes, the definition of the term "risk" was expanded to embrace all of the operations of any one assured in all of these states. The experience had to be reported and tabulated separately for each state in accordance with the provisions of the plan as applied to "intra-state" risks. The tabulated experience was then summarized and an average final modification calculated. This average modification applied in each state where the risk did not qualify for rating on an "intra-state" basis. For states where the risk did qualify for rating the state modification was adjusted by a so-called "F" factor.⁽³¹⁾ Furthermore, a balancing factor of .975⁽³²⁾ was used in the rating of all interstate risks. The complicated procedure and considerable labor involved apparently did not seem to be justified in view of the small number of risks qualifying under this plan and the reluctance on the part of regulated states to subscribe to this method of rating.

(31) The ratio of the total adjusted loss, obtained by applying the average modification to the total expected losses for qualifying states, to the sum of the intra-state adjusted losses for these states.

(32) Representing the average off-balance of rating plans.

Other States

In this chapter the author wishes to give a brief description of rating plans used in states where the method of approach is radically different from the plan described in the preceding chapter. This group, in addition to Pennsylvania and Delaware, contains noticeably all of the states having monopolistic state funds.

Nevada

There is no experience rating plan in this state but the Industrial Commission is authorized to increase rates where the experience of a particular work or establishment is found to be more hazardous than that of a similar undertaking.

North Dakota

The plan provides for an experience period of five years and a minimum average annual premium of \$25 during the experience period. Credits are apparently granted both prospectively and retroactively, debits prospectively only. All losses except Death and Permanent Total cases are taken at full value. Claims resulting in Death and Permanent Total cases are taken at \$3,000. If the indicated risk pure premium for the experience period is less than the classification pure premium, the risk is entitled to credit. If, on the other hand, the indicated pure premium exceeds the classification pure premium, a debit is imposed. Credits are limited to 15% and debits to 30%. The experience rating formulæ are as follows:

$$\frac{\text{Expected Losses} - \text{Actual Losses}}{\text{Expected Losses}} 15\% = \% \text{ credit}$$

$$\frac{\text{Actual Losses} - \text{Expected Losses}}{\text{Expected Losses}} 30\% = \% \text{ debit}$$

In the actual merit rating rules shown in the North Dakota Compensation Manual, these formulæ are not shown and reference is made to a Basic Allowance Factor and a Basic Compensation Allowance. A close analysis, however, of these terms brings out the fact that they are synonymous with pure premium and expected losses respectively. This plan is in some respects similar to the early plans based on loss ratios. It does not give any recognition to size of risk and dependability of indications.

Ohio

The period of five years and a minimum earned premium of \$100 during the period are required in this state. Traveling salesmen and clerical office employees are excluded from experience rating. Losses are divided into normal and excess portions, \$500 constituting a normal indemnity and \$200 a normal medical loss. Catastrophe losses, as specifically defined in the manual, are entirely excluded from rating. Undetermined or doubtful cases are taken at a flat value of \$500.

Experience rating formulæ are provided separately for risks producing less than \$5,000 premium and for risks for premium of \$5,000 or more. These formulæ are:

(a) for Risks under \$5,000

$$\frac{\text{Normal Losses} - \text{Normal Allowance}}{\text{Normal Allowance} + \$5,000} \times \text{Basic Rate} = \text{Total Modification}$$

(b) for Risks over \$5,000

$$\frac{\text{Normal Losses} - \text{Normal Allowance}}{\text{Normal Allowance} + \$5,000} \times \frac{\text{Normal Allowance}}{\text{Normal Allowance} + \text{Excess Allowance}} \times \text{Basic Rate} = \text{Normal Modification}$$

$$\frac{\text{Excess Losses} - \text{Total Losses} - \text{Excess Allowance} - \text{Earned Premium}}{\text{Excess Allowance} + \$50,000}$$

$$\times \frac{\text{Excess Allowance}}{\text{Normal Allowance} + \text{Excess Allowance}} \times \text{Basic Rate} = \text{Excess Modification}$$

$$\text{Total Modification} = \text{Normal Modification} + \text{Excess Modification}$$

Normal allowance is obtained by multiplying the payrolls by the normal factor and dividing the result by 100,000, and the excess allowance is calculated similarly. Normal and excess factors, as calculated for each classification, are shown in the manual.

Credits are applicable retroactively, debits prospectively. If the total modification is less than 3% the basic manual rate applies (it should be noted that the Ohio rates do not contain any loading for expenses and are comparable with pure premiums).

Aside from the fact that the plan is extremely complicated so

that it is difficult to understand its significance, it is also intrinsically discriminatory as between small and large risks. The author has made several calculations and found that it is possible, for example, for a risk with a premium of \$4,999 to enjoy a credit of 10% while a risk with a premium of \$5,000 having exactly the same loss experience would receive a 10% debit.

Oregon

The merit rating plan is written into the Workmen's Compensation Law, Section 43-1825-b. It provides that any employer whose contributions to the fund during the entire period he has been subject to the law, but not more than five years, have been \$50 or more, per annum, shall enjoy reductions in the rate of his contributions or shall have the rate of his contributions increased in accordance with the following schedule:

If Losses Paid Out During Experience Period Are	The Rate of the Contributions Shall be Decreased (-) or Increased (+) by Percentages Indicated
Less than 50% of contributions	- 40%
50% but less than 55% of contributions	- 25%
55% " " " 60% " "	- 20%
60% " " " 65% " "	- 15%
65% " " " 70% " "	- 10%
70% " " " 80% " "	-
80% " " " 85% " "	+ 5%
85% " " " 90% " "	+ 10%
90% " " " 95% " "	+ 15%
95% " " " 100% " "	+ 20%
100% or more contributions	+ 30%

It is further provided that no employer shall be subject to any reduction if the Commission shall find that during the preceding fiscal year he has willfully failed to install or maintain any safety appliance, device or safeguard required by statute. Average values are provided for Death and Permanent Total cases, such average values to be calculated on the basis of the cost of Death and Permanent Total cases during the last fiscal year.

Pennsylvania and Delaware

There have been several plans in effect in Pennsylvania and we shall sketch briefly the early plans and describe the existing plan

in more detail. These plans apply also in Delaware (with separate modification factors since December 31, 1931).

Plan effective September 1, 1918 to December 1, 1919. This plan provided for an experience period of at least 18 months and not more than three years next preceding the current policy. An average premium at latest rates of \$500 per year for the experience period was required. Losses were modified in that fatalities were taken at average values, indeterminate cases were taken from a table except that an optional treatment of indeterminate cases of the latest policy year was permitted. Losses were divided into two portions, the first, so-called "Death and Permanent" portion included fatalities, permanent total cases and all indeterminate cases except those of the last policy year. The second or the "All Other" portion included all the remaining indeterminate cases, temporary cases and medical cases. The "All Other" portion was subject to modification by factors bringing the losses to the latest level of cost. Catastrophes which were defined as accidents involving five or more death or permanent total cases were excluded from experience rating.

In order to obtain the experience modification the plan provided for the calculation of adjusted pure premiums separately for each of the two divisions of losses and in accordance with the following formulæ:

$$X_1 = p_1 + \frac{p_1 N (I_1 - p_1)}{p_1 N + 60,000}$$

$$X_2 = p_2 + \frac{p_2 N (I_2 - p_2)}{p_2 N + 5,000}$$

where X = Adjusted Pure Premium

p = Manual or Schedule Rate Pure Premium

N = Payrolls/100

I = Indicated Pure Premium for Risk

and where the subscripts 1 and 2 refer to the two divisions of experience. Final adjusted rate was determined from the formula:

$$\text{Adjusted Rate} = 1.05 \times [1.58 (X_1 + X_2) + 10]$$

There were attached to the plan indeterminate valuation tables as well as tables showing partial pure premiums varying by size of rate.

It should be noted that the above formulæ for adjusted pure premiums may be written in the form:

$$X_1 = p_1 + Z_1 (I_1 - p_1)$$

$$X_2 = p_2 + Z_2 (I_2 - p_2)$$

$$\text{where } Z = \frac{\text{Expected Losses}}{\text{Expected Losses} + \text{Constant}}$$

which brings out the similarity of this plan to the 1918 Plan of the National Workmen's Compensation Service Bureau described in a previous chapter.

Numerous changes were made in this plan and amendments followed in very quick succession. The experience period was changed to require a minimum of 2 years (effective May 1, 1919) and a maximum of 4 years (effective December 1, 1919). Qualifications were amended to require \$1,000 premium over the experience period (effective February 1, 1921). The treatment of catastrophes was repeatedly amended, involving as well a change in the definition of catastrophe (effective October 31, 1920, whereby catastrophe is defined as an accident involving two or more death or permanent total cases). The catastrophe losses have been included in rating with limitation to the effect that an accident should not increase the rates more than 10% and a single accident shall not enter the rating at a value greater than the expected death and permanent total losses. The modification formula underwent a number of changes assuming, in general, the form:

$$\frac{\text{Expected Losses} - \text{Realized Losses}}{\text{Expected Losses} + \text{Constant}}$$

The constant in the above expression was first \$15,000, then it was changed to \$12,000 and then back again to \$15,000. Self-rating was introduced for risks having expected or realized losses of \$50,000 or more. Credibility was increased by limiting the value of the denominator in the modification formula to \$50,000 whenever the expected losses were between \$35,000 and \$50,000.

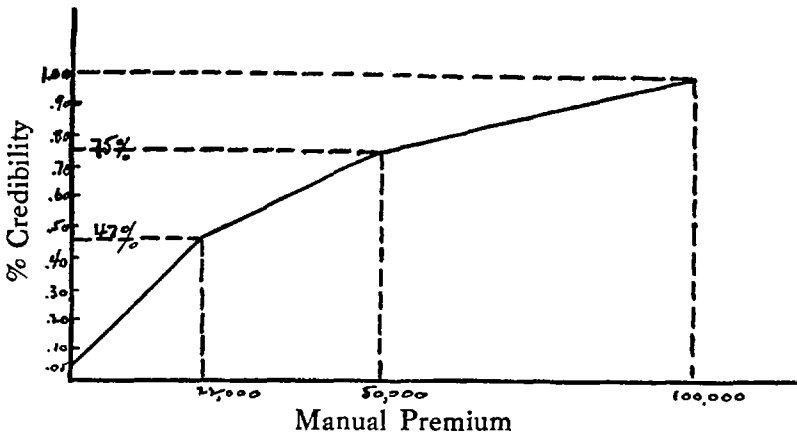
Plan effective from December 31, 1921 up to the present time with slight modifications. The experience period provided is five years but not less than two years (later amended to one year which is the present minimum requirement). A premium of at least \$1,000 for the experience period is required, such premium to be based on extension of payrolls at latest manual rates.

Losses are brought to pure premium level in several divisions using average values for Death and Permanent Total cases and there is provided a table of maximum values which can be assigned to one accident, such values varying in accordance with the size of premium. At present the plan provides medical loss multipliers and wage factors applicable to all losses. Clerical and salesmen payroll is not subject to experience rating unless those two classifications by themselves, meet the rating qualification requirements.

The modification is derived by the formula :

$$M = \frac{\text{Realized Losses}^{(83)} - \text{Expected Losses}}{\text{Expected Losses}} \times C$$

where C represents credibility. The credibility value varied originally from 5% for a risk with a manual premium of \$1,000 to 100% for a risk with a manual premium of \$80,000. The present table provides for full credibility at a manual premium of \$100,000. The present credibility values follow a straight line for premiums from \$1,000 to \$22,000, another straight line with lesser slope for premiums between 23,000 and 50,000 and finally for risks between \$50,000 and \$100,000 the slope is still further reduced, as illustrated in the graph below :



The broken line resembles a great deal the Z curve (see Chart II). The rate for a risk whose manual premium is \$100,000 or

(83) It should be noted that realized losses are actual losses adjusted as mentioned above.

whose losses are \$60,000, is obtained by dividing the total losses modified as explained above by the payroll (per \$100) adding one cent and loading the result for expenses by the factor $\frac{1}{.60}$. A risk rated in this way shall continue to be so rated for one full policy year after it first fails to qualify under this rule.

The Pennsylvania Coal Mining Plan. There were several rating plans for coal mining in Pennsylvania. We shall limit ourselves here to the description of the present plan. In order to qualify, the coal mine risk must be subject to schedule rating except that Surface Mining, Culm Recovery and Coke Burning Classifications which have developed an average annual payroll of \$10,000 or more during the experience period, shall be subject to experience rating based upon the manual rates for such classifications. The experience period is three years but not less than one year. The aggregate payrolls and losses of each classification are treated as a unit for calculation of the experience rate for each class. Catastrophes which are defined as accidents resulting in five or more deaths are excluded from the calculation.

Losses are valued as follows:

1. Death and Permanent Total—\$4,600 on anthracite classes and \$4,400 on Bituminous classes (any accident which at the time of valuation has caused disability lasting two years and is still undetermined is valued as a Permanent Total Disability).
2. Each permanent disability enumerated in section 306 (c) of the Law must be valued in accordance with the provisions of the schedule specified in said section.
3. Each other permanent disability is valued as per award or if no award has been made it is valued as an indeterminate disability.
4. Each temporary disability is valued at the amount paid or accrued to the date of reporting and no accident is classed as temporary unless disability has wholly ceased at the date of reporting.
5. Accidents which caused disability for more than seven days, which disability has neither terminated nor its extent ascertained, are valued in accordance with an indeterminate table, but no such case should exceed the values set for Death and Permanent Total Disabilities.

Neither payrolls nor losses are modified. The experience modifications are obtained in the following manner:

Indicated Rate = Expense loading \times Risk Pure Premium
or

$$r = 1.50 \times \frac{\text{Losses}}{\text{Payroll}}$$

$$\text{Modification} = \left(\frac{\text{Payroll}}{\text{Payroll} + 1,500,000} \right) \times (s - r)$$

where s is the schedule rate of the mine less the catastrophe rate (such catastrophe rate is \$.05 for anthracite mining and \$.15 for bituminous mining).

Self-rating is granted to a risk which develops \$4,000,000 payroll during the experience period. The modification is then found from the formula:

$$M = s - r$$

The experience modification is subtracted from the schedule rate of a credit, or added to the schedule rate of a debit.

Washington

In this state the rates are computed and charged per man-hour. The experience rating plan is incorporated in the act which provides "The Department of Labor shall . . . determine the premium rate . . . and in so doing shall take into consideration the average cost experience of each employer . . . over the five year period immediately preceding September first of the year in which the rate is being determined and in so computing the cost experience of any employer, the fixed sum of four thousand dollars (\$4,000) shall be charged against his experience for each injury resulting in Death or Total Permanent Disability—". The actual premium rate for each employer is obtained by taking 40% of the basic rate and adding thereto 60% of the employer's indicated cost per man-hour during the experience period, subject to a maximum rate of 160% of the basic rate. The minimum period of one year is required in order to qualify for this procedure. Thus, bar the new risk, every risk is experience rated, the maximum credit or debit being 60%. This is a simple plan with a fixed credibility of 60% as applied to the individual risk with an upper limit for debits. Because of its simplicity, however, it is bound to produce violent fluctuations in rates from year to year, especially on smaller risks, and in view of the labor involved in its practical application in a state with a considerable number of

risks would increase the administration expenses beyond the bounds of reasonable relationship to the results.

West Virginia

All risks are subject to experience rating. Experience period of one year only used. The rate for each risk is calculated by dividing the last calendar year's net paid losses by the payrolls during that period. If the resulting pure premium is more than 65% of, or less than 220% of the basic rate, such pure premium is "loaded" for expenses by adding thereto 20% of the base rate and the resulting amount represents the rate. If the pure premium is less than 65% or more than 220% of the base rate, then 65% or 220% of the base rate is used in its place, subject to the same loading.

Wyoming

There is no experience rating plan in this state. Ever since the inception of the Act, a flat rate of \$1.50 per \$100 of payroll was charged for all industries with the provision that if any employer's account with the Workmen's Compensation Department of the State Treasury becomes overdrawn and is not sufficient to take care of injuries to his employees the rate of such employer is automatically raised to \$4.00 per \$100 of payroll until such time as his overdraft is taken care of.

APPENDIX I.

Chart I shows for all of the states the various plans applicable therein as well as the periods during which they were effective. It is based mainly on a compilation by the Aetna Life Insurance Company in September, 1929, which was revised and brought up to date in November, 1934. In this appendix there is given a brief description of the various plans which will permit the reader to recognize their characteristics with ease.

In the following description the words "latest manual rates" refer to the rates effective on the date when the policy for which the adjusted rates are being calculated will be issued. The words "current manual rates" refer to the rates effective during the period next preceding the effective date of the policy for which adjusted rates are being calculated.

NATIONAL WORKMEN'S COMPENSATION SERVICE BUREAU PLANS

I—Plan A

1. Experience Period: Minimum 2 years, maximum 5 years.
2. Qualification: Minimum: \$100,000 payroll or \$50,000 if not schedule rated and \$500 premium at latest manual rates over minimum experience period. For longer periods increased pro rata.
3. Loss Modification: Average values in weeks used for the various kinds of losses: Fatal, Permanent Total, Dismemberments, Other Compensation, in dollars for Medical. Loss ratio determined by comparing indicated pure premium from modified losses with average manual rate.
4. Neutral Zone: For risks with loss ratios from 40% to 65% no experience modification.
5. Principle of Calculation:

A. For Risks subject to Schedule Rating.

$$(a) \frac{40 - r}{40} \times \text{Maximum Credit} = \text{Percentage of credit for risks with loss ratios less than 40\%}.$$

$$(b) \frac{r - 65}{100 - 65} \times \text{Maximum Debit} = \text{Percentage of debit for risks with loss ratios between 65\% and 100\%}.$$

Maximum credits and debits vary from 5% for \$500 premium to 20% for \$5,000 premium and over.

Modification is combined with schedule modification by adding together and the sum is subject to a maximum of 40% credit.

B. For Risks Not Subject to Schedule Rating.

$$(a) \frac{40 - r}{40} \times 25 = \text{Percentage of credit for risks with loss ratios less than 40\%}.$$

$$(b) \frac{r - 65}{100 - 65} \times 25 = \text{Percentage of debit for risks with loss ratios between 65\% and 100\%}.$$

C. For risks with a loss ratio of 100% and over maximum debit of 25%.

State sheets showing average values for Fatal, Permanent Total, Various Dismemberment and other Compensable cases and also average Medical values were attached to the plan.

6. This plan was compulsory for member companies. The name Plan "A" was given for reference when a second plan was issued, superseding the first, and called Plan "B".

II—Plan B

1. Experience Period: Minimum 21 months, maximum 45 months, including 9 months of current policy.
2. Qualification: Minimum \$50,000 payroll or \$30,000 if not schedule rated and \$300 premium at latest manual rates over minimum experience period. For longer periods increased pro rata.
3. Loss Modification: D. & P. T. Indemnity, flat charge per case. Other losses—modification factors applied to bring to latest level of cost in two divisions: Indemnity and Medical.
4. Neutral Zone: No modification for the "All Other" portion granted for risks with loss ratios between 45% and 65% for the "All Other" part of the experience.
5. Principle of Calculation: Modification determined from comparison of adjusted premium reflecting risk experience departure and manual premium with various limitations as shown below:
 - (a) Fatal and Permanent Total Losses—adjusted premium determined from manual partial premium for this coverage by subtracting percentage credit for no losses and adding a flat charge per case.*
 - (b) All Other—adjusted premium determined from modification proportioned to all other partial loss ratio. Loss ratio obtained by dividing modified losses by partial manual premium.

For risks with a loss ratio of 100% or more maximum debit applied.* For risks with loss ratios between 45% and 65% no modification granted.

$$\frac{45 - r}{45} \times \text{Maximum Credit}^* = \text{Percentage of credit}$$

for risks with loss ratios less than 45%.

* Maximum allowable credits and maximum allowable debits in (b) and flat charges in (a) varied by seven risk groups depending on size of rate. Individual state rate sheets showing risk rate groups and maximum amounts charged or credited for each group as well as loss modification factors were attached to the plan.

$$\frac{r - 65}{100 - 65} \times \text{Maximum Debit}^* = \text{Percentage of charge}$$

for risks with loss ratios between 65% and 100%.

- (c) Final modification was determined by comparing total adjusted premium under (a) and (b) to total manual premium. Maximum credit over all is limited to 30%. Maximum debit is limited to 30% except when Death and Permanent Total losses were incurred in which case there was no limit. Experience modification was combined with schedule modification by adding, sum being subject to a maximum credit of 40%.

6. This plan was compulsory for member companies.

III—Plan C—Employers' Liability

Employers' Liability Plans do not belong properly in this description but since Employers' Liability insurance and Workmen's Compensation insurance are linked very closely together, brief summaries of Employers' Liability plans are included in this appendix.

1. Experience Period: Minimum 30 months, maximum 54 months including six months current policy.
2. Qualification: Minimum \$50,000 payroll and \$500 premium at latest manual rates for minimum period; increased pro rata for longer periods.
3. Loss Modification: Actual incurred losses (subject to limit of \$2,000 per case) including first aid and allocated claim expense, brought to current level of cost by factors. Loss ratio determined by comparing modified losses to manual premium. State sheets showing loss modification factors by policy years were attached to the plan.
4. Neutral Zone: For risks with loss ratios between 35% and 55%.
5. Principle of Calculation: Modification proportioned to risk loss ratio as follows:

$$(a) \frac{35 - r}{35} \times 30\% = \text{Percentage of credit for risks with loss ratios less than 35\%}.$$

* Maximum allowable credits and maximum allowable debits in (b) and flat charges in (a) varied by seven risk groups depending on size of rate. Individual state rate sheets showing risk rate groups and maximum amounts charged or credited for each group as well as loss modification factors were attached to the plan.

- (b) $\frac{r - 55}{55} \times 40\%$ = Percentage of debit for risks with loss ratios between 55% and 100%.
- (c) Risks with loss ratios of 100% or over were given maximum debit of 40%.

6. This plan was compulsory for member companies.

IV—Plan D—1918 Plan

This plan is described in detail in the body of the paper.

NATIONAL COUNCIL PLANS

This group of plans includes the Industrial Experience Rating Plans 1920, 1923 and 1928, all of which are described in detail in the body of the paper.

EMPLOYERS' LIABILITY PLANS ISSUED BY THE NATIONAL BUREAU OF CASUALTY AND SURETY UNDERWRITERS

V—Employers' Liability Experience Rating Plan—1923 (Amended December 1, 1926)

1. Experience Period: Minimum 1 year, maximum 4 years (5 years effective December 1, 1926) terminating 1 year prior to effective date of rating.
2. Qualification: Minimum \$500 (\$600 effective December 1, 1926) premium at latest manual rates for standard limits, on payrolls of experience period. This requirement was revised on December 1, 1932 to require \$400 premium at latest manual rates on basis of payrolls of last year or last two years.
3. Loss Modification: Losses including allocated claim expenses as incurred, whether on "first", "full" or "no" medical aid basis, but subject to standard limits, are modified by factors to bring to current premium level. Modified case losses subject to limiting values of $\frac{2P}{Z}$ and losses of one accident to limit of $\frac{4P}{Z}$ so no claim should affect the rate over 20% and no accident should affect rate over 40%. In the edition of December 1, 1926 the rating basis changed from premium comparison to loss comparison: Modification factors bring losses to current level of cost. Modified losses

subject to standard limits. Limiting values become $\frac{.2E}{Z}$ and $\frac{4E}{Z}$. Experience rating on full aid or ex-medical basis only. Risks with first aid medical only are rated on ex-medical basis.

4. Principle of Calculation: Indicated premium or modified losses compared to premium at latest manual rates, at "no", "first", or "full" aid (as written) with following credibility for indicated premium departure:

$$\text{Credibility } Z = \frac{P}{P + 10,000} \text{ where } P = \text{Subject Premium}$$

5. The plan was compulsory except that risks carried prior to June 1, 1916, could be carried with special rates.

NEW YORK PLANS

VI—Plan Issued in January, 1915

1. Experience Period: Minimum 2 years, maximum 5 years, terminating at effective date of rating. (Contemplates liability experience—number of accidents by type and payroll.)
2. Qualification: \$25,000 payroll in experience period.
3. Loss Modification: Losses valued on schedule of valuation with injuries reported by number and kind. Loss ratio determined by comparing indicated pure premium and manual rates.
4. Principle of Calculation: Modification proportioned to risk loss ratio with various limitations. Graphs were provided from which debits and credits could be read, given the loss ratio and payroll size group.

A. For risks subject to Schedule Rating.

\$25,000 - \$50,000 payroll:

Loss ratio less than or equal to	25%	credit of 10%.
Loss ratio more than and less than	25% 50%	credits from 10% to 0.
Loss ratio more than and less than	50% 75%	debits from 0 to 10%.
Loss ratio equal to or more than	75%	debit of 10%.

\$50,000 - \$100,000 payroll :

Loss ratio less than or equal to	20%	credit of 15%.
Loss ratio more than and less than	20% 50%	credits from 15% to 0.
Loss ratio more than and less than	50% 80%	debits from 0 to 15%.
Loss ratio equal to or more than	80%	debit of 15%.

Over \$100,000 payroll :

Loss ratio less than or equal to	15%	credit of 20%.
Loss ratio more than and less than	15% 50%	credits from 20% to 0.
Loss ratio more than and less than	50% 80%	debits from 0 to 20%.
Loss ratio equal to or more than	80%	debit of 20%.

Subject to a maximum credit of 20% when combined with result of moral hazard rating section of Schedule. Practically only a guide for determination of discretionary credits in case of schedule rated risks.

B. For risks not subject to Schedule Rating.

\$25,000 - \$50,000 payroll :

Loss ratio less than or equal to	20%	credit of 18%.
Loss ratio more than and less than	20% 50%	credits from 18% to 0.
Loss ratio more than and less than	50% 80%	debits from 0 to 18%.
Loss ratio equal to or more than	80%	debit of 18%.

\$50,000 - \$100,000 payroll :

Loss ratio less than or equal to	20%	credit of 24%.
Loss ratio more than and less than	20% 50%	credits from 24% to 0.
Loss ratio more than and less than	50% 80%	debits from 0 to 24%.
Loss ratio equal to or more than	80%	debit of 24%.

Over \$100,000 payroll:

Loss ratio less than or equal to	20%	credit of 30%.
Loss ratio more than and less than	20% 50%	credits from 30% to 0.
Loss ratio more than and less than	50% 80%	debits from 0 to 30%.
Loss ratio equal to or more than	80%	debit of 30%.

5. Experience rating optional.

VII—Plan Effective June 30, 1916 to June 30, 1917*

This plan is like Plan A of Workmen's Compensation Service Bureau.

1. Experience Period: Minimum 2 years, from June 30, 1914. (Workmen's Compensation only).
2. Qualification: Minimum \$100,000 payroll (\$50,000 for "contracting" risks) and \$500 earned premium in minimum experience period. For longer periods, increased pro rata.
3. Loss Modification: See Plan A.
4. Neutral Zone: No experience modification for risks with loss ratios between 40% and 65%.
5. Principle of Calculation: Modification determined from loss ratio.

Loss ratios less than 40% $\left(\frac{40-r}{40}\right) \times$ Maximum Credit =
Percentage of Credit.

Loss ratios more than 65% $\left(\frac{r-65}{100-65}\right) \times$ Maximum Debit
and up to 100% = Percentage of Debit.

Loss ratios over 100% — Maximum Debit applied.

Maximum Credits and Maximum Debits varied from 5% for \$500 premium to 20% for \$5,000 and over in accordance with formula.

$$\text{Maximum Debit or Credit} = 5 \frac{\text{Premium} - 500}{300}$$

Modification was combined with schedule modification, if any, by adding together and the sum was subject to a maximum credit of 40%.

6. This plan was compulsory. Table of average values for losses was attached to the plan.

* No rating plan was in effect during the period from June 30, 1917 to June 30, 1918.

VIII—*Plan Effective June 30, 1918 to June 30, 1920**

This plan is like Plan D of the National Workmen's Compensation Service Bureau with differences noted:

1. Experience Period: Minimum 21 months, maximum 45 months including 9 months of current policy; not amended.
2. Qualification: Minimum \$500 premium at latest manual rates over last 21 months of period; not amended.
3. Loss Modification: Catastrophe value changed to \$18,750 from \$12,500 effective March 5, 1919. Classes with special catastrophe hazards eliminated entirely from rating effective March 5, 1919.

IX—*Plan Effective June 30, 1920 to June 30, 1923*

This plan was like the Industrial Experience Rating Plan 1920 of the National Council with differences noted:

1. Qualification: \$500 premium instead of \$450.
2. Principle of Calculation: No self-rating rule provided.

X—*Plan Effective June 30, 1923 to Present*

This plan is like the Experience Rating Plan—1923 of the National Council, with differences noted:

1. Experience Period: Minimum 1 year, maximum 4 years, terminating 1 year prior to effective date of rating.
2. Qualification: \$2,000 premium at latest manual rates over experience period or \$500 average annual premium over last two or more years.
3. Principle of Calculation: Credibility formulæ apply up to \$60,000 normal partial premium and \$80,000 excess partial premium. Self-rating points are \$120,000 normal partial premium and \$160,000 excess partial premium. Credibility values for normal premiums between \$60,000 to \$120,000 and excess premiums between \$80,000 to \$160,000 taken from lines drawn from *Z*-formula curves to the point of self-rating. Weights of 1.00, .75, .50 and .25 introduced May 1, 1928 for the experience of the policy years from latest to earliest.

* No rating plan was in effect during the period from June 30, 1917 to June 30, 1918.

CALIFORNIA PLANS

XI—Plan Effective July 1, 1921 to September 30, 1924

1. Experience Period: Minimum 1 year, maximum 3 years, next preceding current policy period.
2. Qualification: \$1,000 premium at latest manual rates over experience period.
3. Loss Modification: Death and Pension cases used at average values given. Indeterminate cases valued from table. Other cases at carriers' values. Loss modification factors provided for all losses to bring them to current level of cost in two sets—All Other and Medical. Catastrophe losses from one accident limited to \$12,500 and this amount placed in Death and Pension losses for any accident which involved five or more Death and Pension cases or cost in excess of \$12,500.
4. Principle of Calculation: Modification dependent on departure of actual from expected losses, with weighting, in two divisions—Death and Pension and All Other. Partial pure premiums to determine expected losses in two divisions given by classifications in a table attached to the plan.

Modification was obtained from the following calculations:

$$X_1 = \frac{\text{Expected D. \& Pension Losses} - \text{Actual D. \& Pension Losses}}{15,500 + \text{Expected D. \& Pension Losses}}$$

$$X_2 = \frac{\text{Expected A. O. Losses} - \text{Actual A. O. Losses}}{6,000 + \text{Expected A. O. Losses}}$$

$$\text{Final Modification} = \frac{X_1 \times \text{D. \& Pension Expected Losses} + X_2 \times (\text{A.O.}) \text{ Expected Losses}}{\text{D. \& Pension Expected Losses} + \text{A.O. Expected Losses}}$$

5. Risks with classifications in table of extra hazardous classifications not subject to rating unless the classifications are minor for the risk. Tables were attached which contained loss modification factors, indeterminate case values, classification partial pure premiums and list of classes not subject to rating.

XII—Plan Effective September 30, 1924 to March 1, 1929

This plan is like the Experience Rating Plan—1923 of the National Council with credibility formula constants (K values) determined on same criterion but without a self-rating provision. Weights were not introduced. The qualification requirement calls for \$1,000 premium at latest manual rates within last 3 years of experience period.

XIII—Plan Effective March 1, 1929 to Present

This plan is like the Experience Rating Plan—1928 of the National Council with credibility constants (K values) on same basis, has the same weights for the experience years but credibility is determined from the Z -formulae for all risks.

MASSACHUSETTS PLANS

XIV—Plan Effective May 1, 1916 to December 31, 1918

1. Experience Period: Minimum 1 year, maximum 5 years, including 6 months of current policy. (Workmen's Compensation experience only.)
2. Qualification: \$25,000 payroll during experience period.
3. Loss Modification: Average values used for various kinds of losses: Fatal, Permanent Total, Dismemberment, all other tabulatable accidents and medical. Loss ratio determined by comparing indicated pure premium from modified losses with average manual rates.
4. Neutral Zone: No experience modification for risks with loss ratios between 45% and 65%.
5. Principle of Calculation: Modification proportioned to risk loss ratio with various limitations as follows:

Credit = $(45 - \text{Loss Ratio}) \times \frac{2}{3}\%$ subject to a maximum of 30% for risks with loss ratios of less than 45%.

Debit = $(\text{Loss Ratio} - 65) \times 1\%$ subject to a maximum of 30% for risks with loss ratios over 65%.

Modification combined with schedule modification, if any, by adding together.

Sum modified by factor of 4/7 and further subject to a maximum credit of 40%.

XV—Plan Effective December 31, 1918 to December 31, 1920

This plan is like Experience Rating Plan D with the following exceptions:

1. Experience Period: 21 months minimum, 45 months maximum, including nine months of current policy. (This provision remained without change throughout the period during which the plan was applicable.)
2. Qualication: \$100,000 payroll or \$300 premium at latest manual rates during last 21 months of experience period.

XVI—Plan Effective December 31, 1920 to December 31, 1923

During this period the National Council 1920 Plan applied with the exception that the qualifications required \$100,000 payroll in the last 18 months of the experience period, or a payroll producing \$250 premium at latest rates. Another exception was the requirement for self-rating of \$120,000 instead of \$80,000.

XVII—Massachusetts Experience Rating Plan—1923

This plan, effective December 31, 1923 to December 31, 1928 is like the 1923 Experience Rating Plan of the National Council, with same criterion for credibility constant (K values) determination. Differences:

1. Qualification: \$350 premium at latest manual rates on latest year or 2 years of experience period.
2. Principle of Calculation: Self-rating point at \$135,000.

XVIII—Massachusetts Experience Rating Plan—1928

This plan, effective December 31, 1928 to the present, is like the 1928 Experience Rating Plan of the National Council, with the same credibility rule and the same experience year weights. The differences are:

1. Qualification: \$350 premium at latest manual rates on latest year or 2 years of experience period. (Revised March 1, 1933 to \$700.)
2. Principle of Calculation: The formula credibility curves operate up to \$45,000 normal partial premium and \$25,000 excess partial premium. After these respective limits the normal and excess credibility are taken from lines tangent to the curves and reaching the point of self-rating at \$97,000 normal partial and \$75,000 excess partial premiums.

NEW JERSEY EXPERIENCE RATING PLANS

Plan A and Plan B applied in New Jersey. The Compensation Rating and Inspection Bureau of New Jersey issued a separate plan effective June 30, 1918 to February 1, 1921 very similar to the National Workmen's Compensation Service Bureau Plan D. The Industrial Experience Rating Plan—1920 of the National Council applied in New Jersey from February 1, 1921 to July 4, 1923. Since July 4, 1923 the New Jersey Experience Rating Plan—1923—like the National Council's 1923 Plan—has applied, with a new printing effective July 1, 1931 and a new edition effective June 30, 1934.

XIX—*Plan Effective June 30, 1918 to February 1, 1921*

This plan is like the Plan D of the National Workmen's Compensation Service Bureau. Differences:

1. Experience Period: Minimum 21 months, maximum 45 months, including 4 months of current policy.
2. Qualification: Minimum \$500 premium at latest manual rates on last 21 months of experience period.
3. Loss Modification: Permanent Total Table for valuing Permanent Total cases dependent on duration at valuation. Replaced by average Death and Permanent Total values July 1, 1919. Indeterminate Disability valuation table provided.

The rule of Plan D excluding special catastrophe elements in certain rates was removed from the New Jersey Plan July 1, 1919.

Catastrophe: Same rule as Plan D excluding cost above \$12,500 but in addition no loss could be used at value greater than 20% of premium subject. This special provision removed July 1, 1919.

4. Credibility decreased July 1, 1919 by raising constants.

XX—*Plan Effective July 4, 1923 to Present (Reprinted July 1, 1931 and new edition issued June 30, 1934)*

This plan is like the 1923 National Council Plan with the following differences:

1. Experience Period: Minimum 1 year, maximum 4 years, terminating 1 year prior to effective date of rating. Revised January 1, 1924: Minimum 1 year, maximum 5 years.

2. Qualification: Average annual premium \$300 over experience period at latest manual rates, \$600 minimum.

Revised 11-14-23	\$ 600 latest two years or	\$300 average
7- 4-25	\$ 700 latest year or 2 years or	\$350 average
6- 1-26	\$ 750 latest year or 2 years or	\$375 average
6-30-27	\$ 800 latest year or 2 years or	\$400 average
7- 1-29	\$ 900 latest year or 2 years or	\$450 average
7- 1-30	\$1,000 latest year or 2 years or	\$500 average
11- 1-31	\$1,100 latest year or 2 years or	\$550 average
6-30-33	\$1,000 latest year or 2 years or	\$500 average

3. Principle of Calculation: Z values (credibility) determined from expected losses, not premiums, but keyed to National Council criterion (20% maximum charge from single claim on \$1,000 premium risk).

Change effective January 1, 1930. Credibility determination modified like 1928 National Council Plan. Tangents drawn to credibility curves from self-rating points corresponding to average normal portion of \$125,000 total subject premium and average excess portion of \$250,000 total subject premium. (\$283,000 effective July 1, 1930.)

4. Table attached to plan giving classification excess ratios as well as a table showing credibility values.
5. Catastrophe Treatment: No accident to be used in the rating at a value greater than two Death or Permanent Total cases.

PENNSYLVANIA RATING PLANS

The plans in effect in Pennsylvania and Delaware (in the latter state separate modification factors introduced since December 31, 1931) are described in the body of the paper in the chapter entitled "Other States".

TEXAS EXPERIENCE RATING PLANS

XXI—

The Experience Rating Plan—1923 became effective in Texas April 1, 1924. A separate plan was issued January 1, 1926 to comply with legal requirements but the plan was essentially the same except that the experience period was 1 to 4 years and there was no self-rating provision. A revised plan was issued effective March 1, 1930 which is also like the 1923 National Coun-

cil Plan. The experience period remains 1 to 4 years. Credibility constants (K values) are determined so that a single claim shall not result in a charge of more than 30% on an average premium basis. The catastrophe classifications provision remains with Table "C" giving the catastrophe splits not subject to rating. There is no self-rating and the experience is not weighted by policy years.

WISCONSIN EXPERIENCE RATING PLANS

XXII—*Plan Effective July 1, 1926 to April 1, 1929*

This plan was based on the 1923 National Council Plan but was more similar to the 1928 National Council Plan.

1. Principle of Calculation: Like 1928 National Council Plan. K values determined on same criterion. Credibility formula: At points corresponding to \$44,000 normal subject premium or more and \$26,150 excess subject premium or more, the credibility is taken from a table. Credibility values lie on straight lines from these points to the self-rating points at approximately \$83,000 and \$88,000 partial subject premium.

XXIII—*Plan Effective April 1, 1929 to Present*

The 1928 National Council Plan became effective in Wisconsin on April 1, 1929 with the exception that the premium qualification for experience rating is \$800 and the points of self-rating require a total subject premium of \$132,000 for full normal credibility and a total subject premium of \$230,000 for full excess credibility.

APPENDIX II.

Tangent to the Credibility Curve

The credibility curve is given by the equation

$$Z = \frac{P}{P + K} \quad (1)$$

In order to obtain the slope of the curve we have to find the derivative of Z with respect to P or $\frac{dZ}{dP}$:

$$\frac{dZ}{dP} = \frac{(P + K) - P}{(P + K)^2} = \frac{K}{(P + K)^2} \quad (2)$$

The equation of a straight line passing through a point is

$$y - y_1 = M(x - x_1) \quad (3)$$

or in our case the tangent to the credibility curve passing through the point of self-rating will be:

$$Z - Z_s = \frac{K}{(P_t + K)^2} (P - P_s) \quad (4)$$

where the subscript s denotes the point of self-rating and the subscript t denotes the point of tangency.

In order to find the coordinates of the point of tangency or Z_t and P_t expressed in terms of the premium at the point of self-rating, consider that since such point must lie on the tangent it will satisfy (4). We have therefore:

$$Z_t - Z_s = \frac{K}{(P_t + K)^2} (P_t - P_s) \quad (5)$$

On the other hand by definition

$$Z_t = \frac{P_t}{P_t + K} \quad (6)$$

Substituting in (5) for Z_t its value and observing that $Z_s = 1$, we obtain

$$\begin{aligned} \frac{P_t}{P_t + K} (P_t + K)^2 - (P_t + K)^2 &= K P_t - K P_s \\ \text{or } 2 P_t &= P_s - K \\ \text{hence } P_t &= \frac{P_s - K}{2} \end{aligned} \quad (7)$$

Substituting in (6) the value of P_t as given in (7) we obtain

$$Z_t = \frac{P_s - K}{P_s + K}$$

Chart II shows the points of tangency to the present New York normal and excess credibility curves as well as the straight line actually used in that state.

CHART OF STATES SHOWING PLANS APPLIED AND PERIODS
DURING WHICH EFFECTIVE*

STATE	TYPE OF PLAN AND THE PERIOD DURING WHICH EFFECTIVE					
	PLAN A **	PLAN B **	1918 PLAN †	1920 PLAN †	1923 PLAN †	1928 PLAN †
Alabama	—	—	—	8-1-1921 to 4-1-1924	4-1-1924 to 7-1-1929	7-1-1929
Arizona	No Experience Rating Plan.					
Arkansas	No Compensation Legislation — Employers' Liability Plan — 1923 (9-1-1923)**					
California	Special Plans — See Appendix I					
Colorado	—	—	4-1-1919 to 7-1-1921	7-1-1921 to 7-1-1924	7-1-1924 to 7-1-1929	7-1-1929
Connecticut	10-1-1916 to 8-1-1917	8-1-1917 to 8-31-1918	8-31-1918 to 1-1-1921	1-1-1921 to 6-1-1924	6-1-1924 to 7-1-1929	7-1-1929
Delaware	See Pennsylvania.					
Dist. of Col.	1923 Employers' Liability Plan** 9-1-1923 to 7-1-1928					7-1-1930
Florida	No Compensation Legislation — Employers' Liability Plan — 1923 (9-1-1923)**					
Georgia	—	—	—	—	3-1-1924 to 7-1-1929	7-1-1929
Idaho	—	—	1-1-1920 to 12-1-1920	12-1-1920 to 1-1-1924	1-1-1924 to 7-1-1929	7-1-1929
Illinois	10-1-1916 to 8-1-1917	8-1-1917 to 8-31-1918	8-31-1918 to 1-1-1921	1-1-1921 to 6-1-1924	6-1-1924 to 7-1-1929	7-1-1929
Indiana	—	8-1-1917 to 8-31-1918	8-31-1918 to 1-1-1921	1-1-1921 to 6-1-1924	6-1-1924 to 7-1-1929	7-1-1929
Iowa	10-1-1916 to 8-1-1917	8-1-1917 to 8-31-1918	8-31-1918 to 1-1-1921	1-1-1921 to 7-1-1924	7-1-1924 to 7-1-1929	7-1-1929
Kansas	10-1-1916 to 8-1-1917	8-1-1917 to 8-31-1918	8-31-1918 to 1-1-1921	1-1-1921 to 6-1-1924	6-1-1924 to 7-1-1929	7-1-1929
Kentucky	—	—	7-31-1918 to 10-1-1921	10-1-1921 to 2-1-1925	2-1-1925 to 7-1-1929	7-1-1929
Louisiana	10-1-1916 to 8-1-1917	8-1-1917 to 8-31-1918	8-31-1918 to 1-1-1921	1-1-1921 to 9-1-1924	9-1-1924 to 7-1-1929	7-1-1929
Maine	—	10-1-1917 to 12-28-1918	12-28-1918 to 7-1-1924	—	7-1-1924 to 7-1-1929	7-1-1929
Maryland	10-1-1916 to 8-1-1917	8-1-1917 to 8-31-1918	8-31-1918 to 6-1-1920	6-1-1920 to 1-1-1924	1-1-1924 to 7-1-1929	7-1-1929
Massachusetts	Special Plans — See Appendix I					
Michigan	10-1-1916 to 8-1-1917	8-1-1917 to 8-31-1918	8-31-1918 to 1-1-1921	1-1-1921 to 6-1-1924	6-1-1924 to 7-1-1929	7-1-1929
Minnesota	10-1-1916 to 8-1-1917	8-1-1917 to 8-31-1918	8-31-1918 to 1-1-1921	1-1-1921 to 11-1-1924	11-1-1924 to 7-1-1929	7-1-1929
Mississippi	No Compensation Legislation — Employers' Liability Plan — 1923 (9-1-1923)**					
Missouri	See Plan C** 11-1-1917 to 9-1-1923		Employers' Liab. Plan—1923** 9-1-1923 to 1-9-1927		1-9-1928 to 7-1-1929	7-1-1929
Montana	—	8-1-1917 to 8-31-1918	8-31-1918 to 12-1-1920	12-1-1920 to 6-1-1924	6-1-1924 to 7-1-1929	7-1-1929

* The dates shown in this chart are based on the study made by the Aetna Life Insurance Company in September, 1929, and revised in November, 1934.

** For characteristics see Appendix I.

† This plan is described in Part I of the paper.

‡ The exact period of application uncertain.

NOTE: Where the second date is not shown, the plan is still in effect.

Chart I
(Continued)CHART OF STATES SHOWING PLANS APPLIED AND PERIODS
DURING WHICH EFFECTIVE*

STATE	TYPE OF PLAN AND THE PERIOD DURING WHICH EFFECTIVE					
	PLAN A **	PLAN B **	1918 PLAN †	1920 PLAN †	1923 PLAN †	1928 PLAN †
Nebraska	10-1-1916 to 8-1-1917	8-1-1917 to 8-31-1918	8-31-1918 to 1-1-1921	1-1-1921 to 6-1-1924	6-1-1924 to 7-1-1929	7-1-1929
Nevada	Special Plan — See Chapter on "Other States" in Part I					
New Hampshire	See Plan C** 10-1-1917 to 7-1-1924		—	—	7-1-1924 to 7-1-1929	7-1-1929
New Jersey	10-1-1916 to 8-1-1917	†	6-30-1918† to 2-1-1921	2-1-1921 to† 7-4-1924	7-4-1924 †	
New Mexico	—	—	6-8-1918 to 12-1-1920	12-1-1920 to 6-1-1924	6-1-1924 to 7-1-1929	7-1-1929
New York	Special Plans — See Appendix I					
North Carolina	1923 Employers' Liability Plan** 9-1-1923 to 7-1-1929					7-1-1930
North Dakota	Special Plan — See chapter on "Other States" in Part I.					
Ohio	Special Plan — See chapter on "Other States" in Part I.					
Oklahoma	—	—	6-27-1919 to 9-1-1921	9-1-1921 to 12-1-1924	12-1-1924 to 7-1-1929	7-1-1929
Oregon	Special Plan — See chapter on "Other States" in Part I.					
Pennsylvania	—	10-1-1917 to 9-1-1918	Special Plan — See Chapter on "Other States" in Part I			
Rhode Island	10-1-1916 to 8-1-1917	8-1-1917 to 8-31-1918	8-31-1918 to 1-1-1921	1-1-1921 to 6-1-1924	6-1-1924 to 7-1-1929	7-1-1929
South Carolina	No Compensation Legislation — Employers' Liability Plan — 1923 (9-1-1923)**					
South Dakota	—	—	7-1-1919 to 1-1-1921	1-1-1921 to 6-1-1924	6-1-1924 to 7-1-1929	7-1-1929
Tennessee	—	—	—	2-1-1921 to 7-1-1925	7-1-1925 to 7-1-1929	7-1-1929
Texas	10-1-1916 to 8-1-1917	7 to 9-1-1918	9-1-1918 to 3-1-1922	3-1-1922 to 4-1-1924	4-1-1924†	—
Utah	—	—	7-1-1919 to 7-1-1921	7-1-1921 to 7-1-1925	7-1-1925 to 7-1-1929	7-1-1929
Vermont	—	8-1-1917 to 8-31-1918	8-31-1918 to 12-1-1920	12-1-1920 to 7-1-1924	7-1-1924 to 7-1-1929	7-1-1929
Virginia	—	—	—	8-1-1920 to 1-1-1924	1-1-1924	—
Washington	Special Plan — See chapter on "Other States" in Part I.					
West Virginia	Special Plan — See chapter on "Other States" in Part I.					
Wisconsin	—	—	—	—	7-1-1926 to† 4-1-1929	4-1-1929†
Wyoming	Special Plan — See Chapter on "Other States" in Part I					

* The dates shown in this chart are based on the study made by the Aetna Life Insurance Company in September, 1929, and revised in November, 1934.

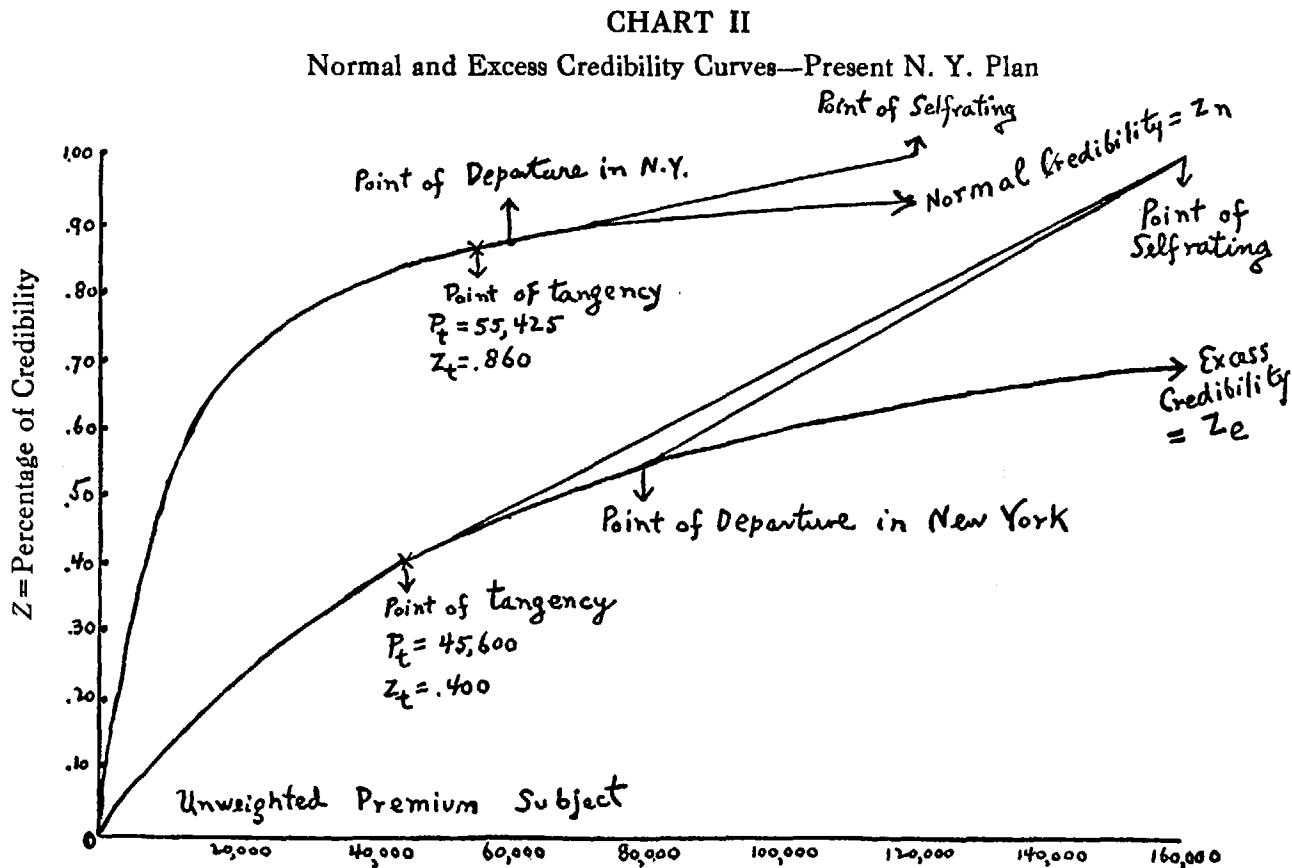
** For characteristics see Appendix I.

† This plan is described in Part I of the paper.

‡ See Appendix I for different features.

¶ The exact period of application uncertain.

NOTE: Where the second date is not shown, the plan is still in effect.



A LETTER

FROM

DR. I. M. RUBINOW

FIRST PRESIDENT OF THE CASUALTY ACTUARIAL SOCIETY

Cincinnati, Ohio

November 21, 1934.

Mr. W. W. Greene
Casualty Actuarial Society
90 John Street
New York City

My dear Mr. Greene:

May I ask you to convey to all my friends and former colleagues my very deep regret that an unavoidable conflict of engagements has made it absolutely impossible for me to go to New York to participate in your celebration? I was deeply touched by the invitation and the evidence which it brought that, though many years have passed since I left the casualty field, I have not been altogether forgotten.

Had I been able to come it would have given me a great deal of pleasure to comply with the request to do a little reminiscing in public. I would have been glad to go back to the days when there was practically no casualty insurance science in this country; would have been glad to relive again our discussions as to whether an organization of the technical men in the field was possible. It would have been interesting to recall the early conflicts, friendly as they were, between the accountants, the statisticians and the actuaries—if there were any actuaries in the field at the time—as to whose influence should predominate in the new organization. It might have been very interesting to go over the list of the charter members—the lucky ones who had no examinations to pass—and to find out how many of them were rather doubtful whether they would want to lend the influence of their name to a new organization, initiated by a new-comer in the field.

But to be enjoyable, or at least tolerable, this reminiscing must be done in the proper atmosphere, perhaps around the table with

glasses of the frothy amber fluid before one. Reminiscing by correspondence would be a very dull business indeed and I must leave it, therefore, to those of my old friends who were with us in 1914 and with you in 1934.

May I, however, take advantage of the occasion to say a word or two about the future rather than the past, the future which is much more important at this moment.

I will confess to a good deal of pride in having made my contribution to the science of casualty insurance in the years gone by and I have no doubt in my own mind that the most important part of that contribution was in taking the initiative to organize the Casualty Actuarial Society; for it has created a forum and a platform around which all scientific work in this branch of insurance has been done in this country. I have no doubt in my own mind that it was because of the C. A. S. 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 the insurer and useful to the people at large.

The Casualty Actuarial Society has not limited itself to one specific branch and yet it requires, I believe, no proof that its primary contribution has been to the field of workmen's compensation, the first branch of social insurance to arise in this country. I have not altogether forgotten the sharp conflicts and sometimes bitter feelings centering around the term "social insurance" and its proponents in this country in years gone by. Perhaps if it had not been for that unhappy antagonism I might still be actively in the field, yet happily those days are gone. If not only social reformers or social workers but also statesmen and industrial leaders have come to recognize the inevitability of a social insurance program in this country, surely we as a professional group, the only professional group which is able to handle these problems in a scientific and objective way, cannot afford to lag behind. On the contrary, I believe—and this is the only message of some importance that I am capable of conveying to you—I believe that it is our duty, our civic as well as scientific duty, to assume leadership in the movement, a leadership which must be abso-

lutely free from any group or commercial interests, a leadership which must be scientific as well as civic, for in social sciences the final test of a true scientific spirit is not the mere determination of facts but the utilization of those facts for the welfare of the people.

What we have done in the field of workmen's compensation in the 20 years that lie behind us we can do even better in the 20 years which are to come so that by the time we will get together to celebrate the 40th anniversary those of us at least who will still be there will be able to point back to a structure of American social insurance and the resulting economic and social security to the American people, to which we as a profession will have made our valuable contribution.

With best wishes for a very happy celebration, in which I shall be present in spirit if not in spirits, I am

Very cordially yours,

I. M. RUBINOW.

ADDRESS

THE ECONOMIC AND FINANCIAL OUTLOOK
AND THE CASUALTY BUSINESS

BY

JULES I. BOGEN

EDITOR, JOURNAL OF COMMERCE

PROFESSOR OF FINANCE, NEW YORK UNIVERSITY

General economic and financial conditions affect casualty insurance in several ways. The rate of business activity will govern to a considerable degree the total volume of such protection that is required. Changes in the general commodity price level will influence the amount of protection that will be needed by the assured in many particular instances. Certainly, any runaway rise in commodity prices would change both the type of protection required and the method of operation of casualty companies. Finally, investments of casualty companies are influenced in substantial measure by the trend of long-time interest rates and broad movements of bond and stock prices, and these in turn are sensitive to monetary and business influences.

A broad appraisal of recent economic and monetary developments, and especially of the current situation, requires that we look back twenty years. The year 1914 witnessed the foundation of the Casualty Actuarial Society, which has been a significant force for good. The same year saw the beginning of the World War, which changed the course of our civilization and effected profound and disastrous dislocations in our economic life. Production of certain types of goods required for war and incidental purposes was enormously expanded. There was a great expansion of debts, especially government debts. A major rise in prices was forced as new money and new credit was issued to permit the governments to buy what they needed to prosecute the conflict.

After the war, we should have had a protracted depression in order to correct the dislocations caused by the conflict. We should have had a deflation of credit, a decline in prices and a readjustment of the relative status of wartime and peacetime industries. But the world at large sought to escape the necessity for such a necessarily painful readjustment. Central banks of

the leading nations co-operated to expand credit anew, to encourage creation of additional indebtedness, to maintain purchasing power, business activity and prices. As a result, a post-war boom developed during the decade of the twenties, which not only delayed the inevitable economic and financial readjustment, but made it far more severe when it came.

A building boom to make up for construction delayed during the war period, the huge volume of business incident to the popularization of the automobile with the resultant need for a national network of roads, and a vast foreign trade based in large part upon billions of dollars of foreign loans; these were the factors which gave us our prosperity in the decade following the war. It was all financed through a vast expansion of indebtedness, represented by bank credit and other types of debt. Bank credit alone increased by an average of some \$1,500,000,000 annually during this period. This vast mass of new indebtedness, however, which spurred on the boom, also insured a subsequent very severe collapse.

During the past five years, we have thus had to reap two major crops of wild oats. We have harvested the crop sown during the war, and the even bigger crop sown in the subsequent era of inflationary credit expansion.

The Roosevelt Administration, on entering office in March, 1933, embarked upon a program of economic changes through legislation which was quite revolutionary in several important respects. Like most revolutions, however, it has tended to become far milder in actual practice than appeared at first. Where is the commodity dollar, which we were promised a scant year ago? Where is the regimentation of industry under the N.R.A. and the Blue Eagle which loomed so large in our national life until this spring? They are gone the way of the snows of yesteryear.

If we should now turn to an appraisal of economic and financial prospects for the future, we find that it is necessary to distinguish between long-term and short-term trends. From the long range point of view, there is every reason to be hopeful, even quite optimistic, for the industrial future of America. We have an unsurpassed technical equipment, a wealth of natural resources and a skilled population, which together should assure a resumption of our economic expansion. Recent surveys have

clearly indicated that even at the peak of the credit boom which culminated in 1929, the average standard of living in this country was surprisingly low. The furnishing of modern housing alone to the bulk of the population would, it is estimated, generate a volume of business far beyond the 1929 peak in the construction and related industries. Unless unsound governmental policies interfere, therefore, the main upward trend in the physical volume of production should re-assert itself in time.

For the near future, however, such an upturn in the physical volume of production faces certain obstacles. Whereas the light manufacturing industries and the volume of retail distribution have recovered substantially from the low levels of 1932 and the first quarter of 1933, and in some cases are again approaching their previous peaks, the capital goods industries remain very severely depressed. Building construction, railroad and public utility maintenance and expansion and such industries as steel and copper production, which depend on construction and the public utilities, are generally operating at a small fraction of the 1929 peak levels. Failure to deflate their costs in proportion to the general decline in the price level and national income, inept governmental policies, continued disorganization of the capital market, and uncertainties created by industrial disputes largely widen the lag between heavy and consumer goods industries which at the moment is perhaps the outstanding characteristic of the business situation. As a forecast for the long run, further industrial recovery and expansion for this country seems assured. For the near future, however, the maladjusted business situation created by the depression of the heavy industries may prove relatively protracted.

The larger volume of business which is indicated for the future will probably be done, however, at a stable or declining commodity price level. In fact, there is a hopeful revulsion of feeling evident in popular circles, both here and abroad, towards monetary manipulation. The great excess productive capacity for many types of goods that now exists and the ability of so many of our industries to expand their productive capacity further whenever necessary make any shortage of most types of goods which we produce in this country all but unthinkable, unless there is an artificial curtailment of supply by government intervention or agreement among producers.

For a time, under the old N.R.A. it appeared as if each industry would be given the power by government to effect such an artificial interference of supply. That is now a thing of the past, and the mere mention of that phase of the N.R.A. is sufficient to bring smiles to those who remember the roaring days of General Johnson and the experiment in a "controlled economy" which he launched with so much vigor but little more than a year ago. We in the United States have certainly tried hard enough to generate an inflationary rise in prices, utilizing about every known device to effect this result. The small and probably temporary success achieved in this direction should give pause to those who continue to favor a general price rise as the open road to business recovery. Far more significant, however, is a tendency for the relationship between prices of raw materials and prices of manufactured goods to re-adjust their inter-relationship. The mal-adjustment between these two great groups of commodity prices has been a major cause of the protracted character of the depression, and if these major groups of prices are brought into more satisfactory relationship between each other, a much greater contribution will be made to lasting and stable business improvement than a forced artificial general price rise can ever accomplish.

While there is very good reason to believe, therefore, that a resumption of the expansion of our industrial output and the rise in our standard of living will be witnessed when the current series of re-adjustments has been completed, there remains a very serious source of concern to those seeking to appraise future business prospects. There is a danger that future business expansion will be accompanied by the same kind of credit and debt inflation that was witnessed during our last boom. In fact, the bane of modern economic civilization appears to be the inability of our leading countries to enjoy a period of expansion in the volume of production without a corresponding sharp increase in the volume of debt. Whenever this debt expansion stops, and creditors insist upon some re-payment, the deflationary forces are let loose which generate recurrent depressions.

Just now, as a reaction to the extremely painful and severe decline of the past five years, steps have been taken by our government and by the Federal Reserve Banks which lay the basis for a greater orgy of debt expansion than the world has ever seen before, short of a currency debauch such as occurred in several

European countries after the World War. The devaluation of the dollar has resulted in the increase in the gold stocks of the United States to an unprecedented total of more than \$8,000,000,000. Of this total the treasury possesses some \$2,700,000,000 of free gold, held in its own cash fund and in the Exchange Stabilization Fund. Whenever this gold is deposited with the Federal Reserve Banks, and the resulting deposits are spent, they will add a corresponding sum to the total of about \$2,000,000,000 in excess reserves which member banks already have with the Federal Reserve Banks. A basis could thus be laid, in the light of existing bank legal reserve requirements, for an increase of approximately \$50,000,000,000 in outstanding commercial bank credit. Many things must happen, doubtless, before there will be demand from those regarded as entitled to credit for such a huge sum. However, the basis has been laid, and if there is not governmental intervention of the restrictive type at the time when credit expansion begins anew, we may merely see repeated, perhaps even on a grander scale, the temporary prosperity and the sequel of deflation and depression through which the world went during the fifteen years that followed the outbreak of the World War.

It is to the interest of the casualty insurance business and its customers, and of all others who are injured by economic instability with its alternating cycles of depressions and booms, that any new expansion of debts, and especially of bank credit, shall be restricted and controlled as much as possible in the period ahead, when the hampering influences now at work no longer influence the activities of bankers and business men.

ADDRESS

THE YOUNGER GENERATION

BY

THOMAS O. CARLSON

I have been requested to utter a few remarks on behalf of the more recently admitted members of the Society upon this memorable occasion of its twentieth anniversary. At the risk of being mobbed later by my fellow-novices, I am going to speak of us collectively as the younger generation because I feel we are essentially such, with our own characteristics and problems. So much unfavorable has been written of late regarding younger generations that the name currently connotes something less flattering than mere youth or apprenticeship. But our own particular one, here in the Society, is unique, I believe, in having and in being willing to profess a profound admiration and respect for the older generation represented by you charter members and earlier initiates. Taken individually we newer members, particularly those of us who are also younger in age and in experience, should probably admit having started upon actuarial work with the flippant self-confidence, the half-cynical skepticism as regards any accomplishments of the past which have always characterized youth. But as our work has progressed, as we have studied for and passed the fellowship examinations, as we have encountered our own individual problems of original investigation, we have one by one come to a realization of the solidity, the fundamental strength of the groundwork laid for the development of our casualty actuarial science in the *Proceedings* of this Society.

As we who were not fortunate enough to be present then look back upon the origination of the Society, or even to its tenth anniversary, we are struck with the contrast presented by a comparison of conditions prevailing in the business in those times and in our own. In November, 1914, the rapid spread of compulsory workmen's compensation legislation was converting the casualty business from a comparatively minor insurance field to a major one. The companies were faced with a multitude of new problems involving principles the basis of which had not yet been investigated: the business was running in advance of its scien-

tific foundation. The organization of the Casualty Actuarial Society provided a much needed forum for the discussion of principles, a medium for the exchange of ideas upon a non-partisan footing. We feel that you who took part in these early meetings were explorers in an uncharted territory and must have known an exhilaration not to be recaptured by us who later traverse that same territory. You had the added impetus of faith in the future of your work, you were still living in an age of faith. The World War was two months old, not expected to last beyond Christmas, and it concerned you as yet only to the extent that its stimulation of our industries was indirectly benefiting your business.

We look back to November, 1924. Changes had occurred, but none that were damaging to casualty insurance. The war had picked us up and dropped us, had smashed ideals and caused a readjustment of values, and its psychological effect was leading us into the greatest industrial boom period in world history. Workmen's compensation insurance had met its first crisis successfully in the early twenties, and you older members contributed materially to that achievement. No one was deeply worried about the 1923 underwriting loss on the workmen's compensation business. Casualty insurance on the whole was prospering. New territory was opening for explorative efforts in the rapid rise of automobile insurance and the more gradual expansion of other lines. Eyes were forward again as in 1914.

We come to November, 1934! What a contrast! We newer members are taking up actuarial work, are entering the Society in a time of universal economic distress; our social structure is debilitated, and we hear and read daily that its weakness is the result of senility, that our institutions must provide the paving stones for the march of a new order. Though the words may bear little conviction to us individually they are not without their effect generally. There is noticeably a widespread fear producing a static inertia more dangerous than the fear itself. Faith has dwindled to a "still, small voice." Eyes are turned backward, or even more frequently downward. And in addition to this prevailing atmosphere of confusion and doubt, the casualty insurance business is shackled with difficulties. That unworrying loss on the workmen's compensation line back in 1923 was the forerunner of a staggering accumulation of losses in a sequence unbroken down to the present date. The second largest casualty line, auto-

mobile insurance, is developing troubles almost hourly it would seem. So far as individuals are concerned progress has been at a standstill for five years. Newcomers to the actuarial field are lucky to find any work however lowly; a few of us have lost the jobs we held and none of us dare hope for the possibility of early advancement.

This ostensible outlook is far from encouraging, particularly to those of us who lack the security of being firmly established in the field. But these superficial appearances are misleading. For the present time may be seen as presenting an unparalleled opportunity to the casualty actuary and upon much more solid evidence than any such vague theory as that of darkness before dawn. It is paradoxically true that a fall in insurance stock brings a rise in actuarial stock—unless, of course, the insurance stock falls below the elastic point. The role of the actuary unfortunately is too frequently that of a doctor and too infrequently that of a counselor. This statement is no reflection upon any of our insurance executives. When a person is well he scoffs at medical advice. That is human nature. When he is ill the doctor is called, and it is also human nature that the doctor is often blamed if immediate cure is not effected.

Ironically, one may roughly follow the ravages of adversity in the casualty business by noting the flow of subject-matter through the *Proceedings* of our Society. In the early years a chronic case of workmen's compensation, then a flurry or two of accident and health almost simultaneously with a slight automobile fever, and of late an acute attack of workmen's compensation. If this observation should lead to suspicion being cast on actuaries, it would be the equivalent of casting suspicion on a doctor by visiting every house he was seen to visit and observing if there was illness in each.

There is good reason to believe that the current afflictions will leave behind them memories of more than ordinary vividness. If so, the casualty actuary should come more and more to fill the role of a permanent health officer rather than of a sick-bed physician. Many companies are awakening to a realization that they need some one in the home office who is familiar with the actuarial side of insurance, some one who can explain what the rating organizations are trying to accomplish through their respective rating programs and why they adopt the means they do to

attain these accomplishments, some one who can interpret the company's own statistics, some one who can aid in treating those individual risk problems which are technically involved. Attention was for years directed primarily to the building up of large premium volumes, but now the problem of a proper balancing between premiums, losses and expenses has forced itself to the front. It is worth while in passing to note the influence that state supervision has exerted in the past five years in the direction of promoting the importance of actuarial work, and also the closer co-ordination that has arisen in rating organizations between the underwriters and the actuaries. I do not mean to forecast any bull market in actuaries. No such positions that I know of have yet opened in companies not having actuarial help today. But company men are talking, are admitting the advisability of such a move, and when the financial lid is loosened a bit there will be more demand than in the past for actuarial services.

No such survey would be complete without mention of the tremendous underdevelopment of the potential casualty insurance field today. Although accurate figures are not available it has been conservatively estimated that scarcely one-fourth of the automobiles are insured despite financial responsibility legislation, less than one-eighth of the insurable glass, about one-third of the theatres, probably less than one-twentieth of the Owners', Landlords' and Tenants' field, and only a fraction of one per cent of the Product Liability field. At present there are only three casualty lines producing an annual premium of \$100,000,000, Accident and Health, Workmen's Compensation and Automobile Liability. But there are other lines which are potentially \$100,000,000-a-year lines. And lastly, there is a great expansion in the field of social insurance around the corner. Company executives shy at the mention of social insurance and for good reason because the development of this field is so inevitably subject to the interference of politics. But it approaches closer and closer to realization along several fronts which are new to us in this country. It is a casualty field, and its problems will in due time be the problems of the members of this Society. We who are new in the business should derive some comfort in these trying days from the realization that although the Society has behind it twenty years of worthy accomplishment the future field of casualty actuarial science is still largely unexplored. We need not look back

upon 1914 with envious eyes, for we in our work, as the founders in theirs, may experience the exhilaration of being pioneers.

Nor are the accomplishments that beckon us merely extensive, they are intensive as well. We are all of us presumably familiar with the statement of the object of the Society in the Constitution. But how many of us have read the phrasing used in the call issued for the first meeting in November, 1914? I should like to quote a portion of it which sets before us a goal toward which to strive, a goal probably never to be completely attained but certainly possible of approximation:

"It is believed that the conclusions of a society organized along these lines will be recognized as authoritative by all who are or all who may become interested in the administration of insurance companies, in legislative action or the administration of laws concerning casualties and accident prevention, and those who individually or through organization seek to reduce the waste due to casualties."

I said earlier that the founders lived in an age of faith; to me that quotation is evidence. If we review the accomplishments and the present position of the Society, even the most optimistic among us will admit there is a long road to be traveled before we approach this goal. It should not be forgotten by us younger members, upon whom in due course will fall the burden of carrying on the work of the Society.

If our progress appears slow, our contributions sparse at the outset, will you not bear in mind the contrast between us and the older members as individuals? The charter members as well as almost all the early initiates were already men of established reputation when they entered the Society. We recent initiates, with a few exceptions well known to you, are not yet established, we have a comparatively limited experience in actuarial work, we occupy clerical positions, we do not have the perspective on the problems we contact that comes to one in an executive or semi-executive position or with a background of committee work and intercompany discussion. This statement is in no wise offered in the spirit of an alibi; it is merely a plea that we be not judged or criticized hastily. We shall fill our places in the Society and worthily, of that you need have no fear, but not with such immediate competence as you older members have done.

In closing, I should like to put in a word for the importance

of receptive participation in the Society meetings. The establishment of the Society as authoritative in the field of casualty insurance cannot be accomplished unless we as individuals carry away and spread the work done here. Let us who have recently been admitted to the Society leave behind us all ideas of membership as an end in itself; let us consider our membership as a means to the end of approaching the goal expressed by the founders, through our increased participation both actively and receptively in the Society meetings and work.

ABSTRACT OF THE DISCUSSION OF PAPERS READ AT
THE PREVIOUS MEETING

INCURRED BUT NOT REPORTED CLAIM RESERVES—THOMAS F. TARBELL
VOLUME XX, PAGE 275

WRITTEN DISCUSSION

MR. H. O. VAN TUYL:

The determination of adequate reserves for claims incurred but not reported is a problem that is worthy of increased attention and the exposition of the subject by Mr. Tarbell should prove of real value to all who have the task of establishing these reserves. He has set forth the essential nature of the problem and has explained in detail the formulæ used by him in computing these reserves. Under this procedure, the incurred but not reported losses of the previous year as developed for a period of eleven months are taken as a base and these amounts are modified by the application of two factors, one to reflect exposure and accident frequency, and the other average claim costs. I believe the method as outlined is thoroughly sound. What I shall have to say will therefore be in the nature of supplemental comment.

That there is at present no uniformity in the methods followed by casualty companies in arriving at these reserves is quite evident. A review of the statements published in Part III of the New York Insurance Department annual report discloses a decided variation in the amounts shown as a reserve for incurred but not reported claims. The reserve for a particular line of insurance in one company may be five times the amount shown by another company with the same approximate volume of exposure. It is hardly possible that each of these reserves is a correct measure of the latent liability for the particular company. It should be kept in mind, however, that the practice of companies differs considerably in the matter of recording claims on

the Home Office records as having been reported during the current year. Where a company holds open its claim register to record every claim that was reported to December 31st to any representative of the company anywhere in the field, a smaller reserve for incurred but not reported claims would be necessary than in the case of a company which used the date reported to the Home Office as the determining date. Then again some companies may include among their known claims all notices received up to the time of compiling final lists of claims where such notices concern claims incurred in the year of the statement. This would of course have the effect of reducing the volume of losses for which a special bulk reserve would be required.

Whatever the procedure followed by a particular company, when once it has been established, it is normally continued from year to year and the data gathered for one or more previous years is applicable as a guide for the future. It is the problem of the individual company therefore to estimate on the basis of its own past experience the probable future cost of claims already incurred but which have not been already provided for through individual estimates because their existence is as yet unknown.

Of the three factors named by Mr. Tarbell as affecting this reserve, the volume of exposure is of the greatest importance. For most lines of insurance the accident or claim frequency and the average claim cost should not change sufficiently in the period of one year seriously to affect the calculation. Except where the volume of exposure is very large, the variations in these factors in a single company can well be ignored. As respects the factor of exposure it is obvious that the greater the volume of risk as measured by premiums in force the greater the number of claims. It is also true that the greater number of incurred but not reported claims will be found to have occurred in the period just preceding the end of the year and that the number of these claims becomes less in each preceding period. To be exact, a sliding scale of weights should be assigned to the premiums in force during each of the months of the year and we would then have an accurate measure of exposure for the purpose in view. It would then be found that the premiums in force during the last two or three months of the year exercise a preponderating influence on the final results and it is for this reason that the volume of premiums in force at the close of the year has been found in actual

practice to be a quite satisfactory basis on which to determine the reserve.

In the case of fidelity and surety only have definite regulations been promulgated for the computation of this reserve. The minimum reserves required by the New York Insurance Department are based upon premiums in force and if the method is satisfactory in the case of the bonding lines, which are subject to considerable variation in incidence of claims and in claims cost, it should afford an even more reliable basis for most other lines.

One reason why the writer favors the use of premiums in force as a basis arises from the fact that he has used this method for several years in determining these reserves. By means of punch cards an exact record was obtained of all claim payments and all claim reserves on claims reported subsequent to the year in which the loss actually occurred. Tabulations of losses paid were made each month and of losses outstanding at the end of each quarter. The accumulated figures at the end of the third quarter furnished nine months' development of incurred losses. By relating these incurred losses to the premiums in force at the end of the previous year percentages were obtained which in turn were applied to the premiums in force at the end of the current year to arrive at a reserve for these incurred but not reported claims. It would be quite in order to use a longer period of development or to modify these percentages to reflect a fully developed cost but for most lines it is safe to ignore claims reported more than nine months after the occurrence of the event producing the claim.

The great advantage of this method is its simplicity and the ease with which the computation can be verified. It satisfies the requirement of reflecting the change in volume of risks exposed to loss and as respects changes in loss cost this is given effect to a certain degree. Any change in the cost of the incurred losses generally will affect the cost of the previous year's subsequently reported claims and so automatically affect the percentage indicating the relationship of the losses to the premiums in force.

If all companies followed a similar procedure in the recording of claims at the close of the year it would seem to be entirely feasible to adopt uniform percentages for use by all companies even as is now done in the case of the bonding lines. Such standard percentages could be revised from time to time as the

data furnished by the companies disclosed the advisability of a change.

MR. ROBERT S. HULL:

Every one who has to struggle with the problem of setting up proper claim reserves is indebted to Mr. Tarbell for his presentation of the subject of Incurred But Not Reported Claim Reserves. Every company must make its estimates, but the methods used have in many cases been somewhat less than scientific. Mr. Tarbell's formula provides an excellent basis for computation subject to the limitations which he sets forth in his paper. The comments that follow are rather by way of suggestion than criticism.

Mr. Tarbell's formula is dependent upon the validity of certain factors as a guide to what may be expected for the coming year. It seems possible that for a company doing a moderate volume of business other factors based on a broader time spread of experience might produce more dependable results.

Mr. Tarbell takes as his starting point "the amount of incurred but not reported claims of the preceding year developed down to the end of (or for the first eleven months of) the current year, modified, if necessary, by a factor to project such claims to an ultimate basis." For a company having a relatively small volume of business, it may be that the claims which chanced to be included in the incurred but not reported of the previous year were insufficient in number to produce a dependable average, i.e., that they might as Mr. Tarbell suggests include a disproportionate share of major claims which would make the results for that year not typical of a normal year. It is possible that a more dependable factor would be the number of incurred but not reported claims developed in the preceding year.

Another factor which Mr. Tarbell uses is the average incurred cost per notice, computed for the last three months of the current and of the preceding year. Mr. Tarbell suggests a longer period than three months for the test, depending on the volume. For workmen's compensation, and liability lines, it is doubtful whether experience so recent as the last quarter or even for the last half of the current calendar year would be dependable for the great majority of companies.

With these considerations in mind, it is suggested that for a

smaller company a more simple formula would produce substantially as dependable results. For example:

$$\text{Reserve} = \frac{N_{10-11-12}^y}{N_{10-11-12}^{y-1}} \times N_T^{-1} \times C$$

When N = Number of notices

C = Average incurred cost per notice

N_T = Number of incurred but not reported claims

y Designates the current calendar year

$y - 1$ Designates the previous calendar year

Subscripts designate calendar months

In this case C will be the latest dependable average ascertainable from the company's experience. It is assumed that the number of incurred but not reported losses may be expected to bear the same relation to the number of notices in the past three months that the number of such notices for the past year bore to the corresponding period of the previous year. This formula has the advantage that it may be applied with slight modification to any month in the year.

Another method which has been followed with reasonably good results is to record the average lag in reporting losses. With a sufficient volume of business and in the absence of exceptional conditions, it will be found that the percentage of notices reported in the month in which they occurred will be fairly constant. Similarly the percentage reported by the end of the next succeeding month and at the end of the second succeeding month will be reasonably dependable.

The following formula may be used:

$$\frac{\frac{N_{12}^a}{R_1} + \frac{N_{11}^a}{R_2} + \frac{N_{10}^a}{R_3} - (N_{12}^a + N_{11}^a + N_{10}^a)}{R_3} \times C$$

Where N^a represents the number of notices with date of accident in the month denoted by the subscript reported to December 31st; R represents the average accumulated percentage of such notices received to December 31st and R_3 is less than unity.

MR. W. P. COMSTOCK:

In his paper entitled, "Incurred But Not Reported Claim Reserves," Mr. Tarbell has made another valuable contribution to our *Proceedings*. He does not claim that he has reached an

entirely complete solution to the problem, but states that he has obtained fairly satisfactory results from the application of his formula.

In a paper entitled, "A Method of Testing Loss Reserves," which I presented before the Society in November, 1930, I called attention to the fact that the bulk of incurred but not reported losses was developed under the workmen's compensation, automobile liability and other liability lines. I do not believe that adequate reserves can be determined on these lines unless the incurred but not reported liability is taken into account. Some companies set up a special voluntary additional reserve in Schedule "P" to take care of this feature as well as any other cause, known or unknown, which may tend to produce an inadequacy.

Mr. Tarbell lists as current factors affecting past experience the following:

- (1) Comparative volume of exposure
- (2) Comparative accident frequency
- (3) Comparative average notice or claim costs

However, he does not directly use the comparative volume of experience in his formula, stating, "The comparative number of notices reflects not only change in volume of business, but change in accident frequency. The trend in claim cost or claim severity is reflected in the average notice cost." I think he is correct in not attempting to use directly the volume of exposure.

The general formula which Mr. Tarbell proposes is as follows:

$$\text{Reserve} = \frac{N_{10-11-12}^y}{N_{10-11-12}^{y-1}} \times \frac{C_{10-11-12}^{y-1}}{C_{10-11-12}^y} \times I_{(1)-(12)}^{y-1}$$

In which N = Number of notices

C = Average incurred cost per notice

I = Amount of incurred but not reported claims

y Designates the current calendar year

$(y - 1)$ Designates the previous calendar year, and subscripts designate calendar months.

Any one attempting to use the formula should note that the last factor $I_{(1)-(12)}^{y-1}$ represents losses incurred in year " $(y - 1)$ " but reported in year " y ". In other words the superscript designates the previous calendar year and the subscript applies to the current calendar year. It would not be correct to base a formula

upon the total losses incurred as shown on a company's statement for the reason that total losses would include increases and decreases on old claims.

The following results were obtained by application of Mr. Tarbell's formula to the three major lines of business written by the two companies with which the writer is associated.

RATIO OF ACTUAL TO EXPECTED LOSSES INCURRED BUT NOT
REPORTED USING TARSELL'S FORMULA

Company A

Calendar Year	Workmen's Compensation %	Automobile Liability %	Other Liability %
1929	107.7	91.3	69.4
1930	85.4	108.6	96.8
1931	97.9	77.0	112.0
1932	109.2	123.8	139.8
1933	108.9	159.4	81.0

Company B

1932	113.0	96.0	48.0
1933	88.0	105.0	132.0

The results for 1933 are based upon actual losses incurred but not reported as developed to September 30, 1934 and hence are not as reliable as they would be were developments available for 12 months. Percentages greater than 100 indicate that use of the formula would have produced inadequate reserves while percentages less than 100 indicate that use of the formula would have produced redundant reserves. The result of using a full year's notices is shown below.

RATIO OF ACTUAL TO EXPECTED LOSSES INCURRED BUT NOT REPORTED
USING NOTICES RECEIVED DURING 12 MONTHS' PERIOD

Company A

Calendar Year	Workmen's Compensation %	Automobile Liability %	Other Liability %
1928	69.2	124.4	186.5
1929	115.9	108.6	77.9
1930	86.7	92.1	70.7
1931	107.1	82.0	140.0
1932	101.1	121.3	132.8
1933	136.6	134.5	66.0

Company B

1931	94.0	99.6	95.0
1932	169.4	107.1	90.1
1933	56.3	87.5	119.7

The use of a longer period did not have the steadying effect which I thought might result. In fact a greater departure from actual results is noticeable when a full year's notices are used. As a last test I eliminated December notices from the calculation as the number of December notices is likely to fluctuate from year to year due to early or late closing of the claim records.

RATIO OF ACTUAL TO EXPECTED LOSSES INCURRED BUT NOT REPORTED
USING OCTOBER AND NOVEMBER NOTICES

Company A

Calendar Year	Workmen's Compensation %	Automobile Liability %	Other Liability %
1929	109.3	100.5	74.7
1930	93.1	108.1	93.5
1931	91.7	82.0	106.4
1932	114.6	114.9	154.0
1933	111.3	158.2	73.0

Company B

1932	172.3	126.5	105.9
1933	50.5	103.0	129.7

On the whole I believe that the results in the last table are the best. Perhaps the inclusion of September notices would have produced better results. Application of the theory of credibility, as Mr. Tarbell suggests, might make the fluctuations less violent. Elimination of abnormal cases is a desirable refinement. With a little more study it would be possible, by use of Mr. Tarbell's formula, to arrive at a fairly close prediction as to the ultimate incurred but not reported loss to be expected.

AUTHOR'S REVIEW OF DISCUSSIONS

MR. THOMAS F. TARBELL:

The author feels that the interest in this subject as evidenced by the thoughtful discussions has well repaid his modest effort to stimulate interest in a rather important phase of casualty reserves.

The discussion of Mr. Hull points out desirable, if not necessary, modifications of the suggested formula to fit the conditions of a company having a comparatively small volume of business in a particular line; the use of what might be termed an average

“normal” value per notice and the extension of the “experience” period, both in the line of overcoming the possible effects of chance fluctuation. The indicated formula would become

$$\frac{N_{(12-n+1)\dots 11-12}^Y}{N_{(12-n+1)\dots 11-12}^{Y-1}} \times N_I^{Y-1} \times C$$

Where n = the number of months' data to be used
and C = a “normal” average value

The formula suggested by Mr. Hull for determining the number of cases to be reserved for, based upon the average lag in the reportings of a particular accident months' notices is a useful one and has been used rather extensively by the author's company in the past, particularly for the automobile property lines and plate glass. The formula as given is a modification, usually sufficiently accurate for practical purposes, of the general formula:

$$\sum_0^n N^a \left(\frac{1}{R_n} - 1 \right) \times C$$

This formula, using a somewhat different notation, together with an example of its practical application will be found in the author's chapter on Reserves in “Casualty Insurance Principles” —Michelbacher.

Mr. Van Tuyl draws attention to the variations in the amounts shown as reserve for incurred but not reported claims. This variation is no doubt due in part to lack of uniformity of definition. In the case of The Travelers we divide the so-called Incurred but not Reported Reserve into two parts for annual statement purposes; one part is designated “Transit” and represents the reserve for claims reported to the field claim offices prior to December 31st but not so reported to the Home Office, the other part is designated “Incurred But Not Reported” and represents cases reported to the field claim offices subsequent to December 31st. The transit portion is included in column (1), “Adjusted or in process of adjustment”, page 5 of the annual statement and the balance in column (5), “Incurred But Not Reported”. The factors necessary for the division of the aggregate reserve are obtained from the punch cards briefly described in the original paper—last paragraph, page 276. The report year referred to designates the calendar year of report to the field claim office. With the exception of Burglary, Boiler and Machinery losses in

excess of \$5,000 which may be reported subsequent to December 31st, we do not include any specific cases in our incurred but not reported reserve.

Mr. Van Tuyl also brings up the point that the volume of exposure is probably the most important factor influencing the incurred but not reported reserve and except where the volume of exposure is very large, the variations in claim frequency and average claim cost can be ignored. The method which he advocates would be expressed in formula form as follows:

$$\frac{PF_{12}^v}{PF_{12}^{v-1}} \times I_{(1)-(9)}^{v-1}$$

Where PF_{12} = Premiums in force at end of year.

This formula should produce satisfactory results for most lines under normal conditions, but the author prefers the more refined formula for the major lines, compensation, liability and the automobile lines, particularly as conditions respecting claim frequency and claim severity for liability and the automobile lines have not been normal in recent years and probably will continue to exhibit somewhat abnormal characteristics in the immediate future. Further such a method does not reflect changes in rate or premium levels. The formula has a serious deficiency, at least theoretically when applied to the compensation line, since the premiums in force are predicated in large part upon estimated advance premiums which tend to be overstated in a period of decreasing industrial activity and depressed in a period of increasing industrial activity.

The author feels that this feature of reserve determination is necessarily an individual company problem and that uniform percentages of premiums in force to be used by all companies as suggested by Mr. Van Tuyl would produce irrational results for individual companies. In addition to the indicated defects of the method as applicable to compensation it should be pointed out that such a method assumes that all companies will have substantially the same loss ratio for each line of business. It would also be predicated upon a uniform practice of reporting notices to the Home Office by the field offices and there is unquestionably considerable variation in such practices, some companies reporting all notices to the Home Office immediately upon report of accident or loss while others wait for varying

periods of time to permit furnishing the Home Office with more complete details of the accident or loss and a more reliable estimate of the cost.

Mr. Comstock's practical tests of the author's suggested formula as applied to the business of the companies with which he is associated are of interest and, of course, pertinent as the value of any such formula is measured by the dependability of the results produced. In the cases of Mr. Comstock's tests the results are admittedly none too satisfactory. There are two conditions which may explain this situation. The factors of accident frequency and accident severity are both subject to chance fluctuation and while so far no attempt has been made to apply the theory of credibility or possibly modifying these factors through an application of experience rating principles casual tests indicate that a rather substantial volume of exposure is required to produce a reasonably high degree of credibility.

The human element is also involved to considerable degree since the factors C^y and C^{y-1} (or A^y and A^{y-1}) depend for accuracy on the ability of adjusters to place relatively correct initial estimated reserves on new cases—that is, the estimates from period to period must correctly reflect trends in claim costs. If estimates on new cases are inadequate at the end of the current year in relation to the reserves at the end of the previous year the result will be to depress the ratio $\frac{C^y}{C^{y-1}}$ and consequently produce too low a reserve. Conversely if the reserves at the end of the current year are relatively redundant the result will be too high a reserve. In case of The Travelers tests similar to Mr. Comstock's show results which are reasonably satisfactory. These tests which are based upon the original formula embracing three months notices show the following ratios of actual to expected incurred but not reported reserves.

Calendar Year of Reserve	Compensation	Auto Liability	Other Liability	Total
1932	112.8	105.1	67.3	100.8
1933	89.9	95.1	123.8	95.5
Total	101.5	100.2	84.3	98.3

While the results for Other Liability are somewhat wide of the mark for both years the results for the other lines, which involve more substantial volumes of exposure, are in our opinion quite

satisfactory. We believe that an undue pessimism, in the minds of our adjusters, as to the trend of Other Liability claims at the end of 1932, accounts in large part for the rather wide variations in the reserves for this line at the end of 1932 and 1933. It is interesting to note that for the three major lines combined the differences between the actual and expected reserves amount to only .8% at the end of 1932 and 4.5% at the end of 1933.

We are continuing to give study to this subject, particularly on the problem of some modification of the basic data by projection methods or weighting of the individual month's experience to reflect the effect of loss cost trends which the present formula necessarily does not fully reflect. If the results of such study are likely to prove of general interest they will be submitted to the Society.

SUGGESTIONS FOR A STANDARD SYSTEM OF NOTATION FOR CASUALTY
ACTUARIAL WORK—THOMAS O. CARLSON
VOLUME XX, PAGE 264

WRITTEN DISCUSSION

MR. J. J. SMICK:

At the last meeting of the Society, a paper by Mr. Carlson containing suggestions for a system of notation was presented. This paper was predicated on the premise that "casualty actuarial science has progressed by now to a point where a standardized system of notation in formulas, applicable as far as possible to all casualty lines is feasible and desirable". A system of notation chiefly centering about basic and delimiting terms and in general following the criteria of (1) simplicity, (2) universality, that is, applicability to all casualty lines, and (3) foundation upon symbols already generally accepted, is presented to the Society for its consideration with the suggestion that the Society establish an acceptable system of standard notation.

For that portion of the Society's membership which is engaged in the technical phases of the work, in the actual calculation of formulæ, in the preparation and analysis of memoranda and papers, the use of the same symbol to represent the same term

would greatly facilitate the exchange and understanding of ideas. As Mr. Carlson points out, it is a great help to be able to recognize at a glance the symbols used in technical problems. But that merely requires uniformity of procedure and not necessarily a fixed and therefore relatively unchangeable system of notation, or at most it requires a bare minimum of standard symbols. Casualty actuarial science has progressed and in the course of its progress formulæ have been established, modified, abandoned and replaced. Thus in experience rating the credibility formula was

evolved by steps from an earlier form until it became $Z = \frac{P}{P + K}$

and is now used infrequently, having in turn been replaced by tables of credibility values, usually called Table "E". Another example of a term fallen into disuse is the wage factor which, during the recent emergency rate making program for compensation insurance, suffered a temporary revival, but has again been abandoned. Only a few of the many symbols and formulæ in use in the past remain and most of those in vogue in previous years have served their purpose and are now rarely, if ever, used. Mr. Carlson has also pointed out a few instances where changing conditions have removed the necessity of retaining symbols. The adoption of a standard system of notation would serve to give many terms a permanence which they do not deserve and thus prevent the use of convenient symbols which might be reassigned for later use. The alternative is to adopt Mr. Carlson's suggestion and maintain a committee, whose duties shall be constantly to revise any adopted system, approving new symbols and deleting old ones. Unless this is done we might soon have an outmoded and unwieldy notational system on our hands.

I am in complete agreement with Mr. Carlson in his desire to obtain more uniformity in the use of symbols, but I do not believe it wise for the Society to establish a standard system of notation. It would seem to me sufficient for the purpose of obtaining uniformity, to have occasional papers presented on the subject in which analysis of customary and criticism of poor or ambiguous terminology can be made. In this way we could always keep abreast of the subject, could keep in the foreground the terms and symbols important in the principal subjects of discussion at the time, and allow little used terms and outmoded formulæ to gradually fade out of the picture. At the same time

the membership of the Society would be able to use these papers as a reference and would see the symbols others are or may be using and will be free to choose or reject the suggestions, in accordance with their own needs.

If we are prepared to adopt a system of notation, then Mr. Carlson's suggestions deserve our most serious consideration. He has very wisely concentrated on those symbols which have been used in the past and for which there is great likelihood to be need in the future. He has pointed out a number of instances where the formulæ are of restricted use, or where contemplated changes will lessen the need for considering and retaining symbols. Mr. Carlson does not directly mention it, but I presume that he implies that by the establishment of a committee due precaution will be maintained to keep the system up to date and anticipate symbols for lines which may shortly become important. A good many of the symbols that Mr. Carlson suggests and which now mainly apply to or are derived from workmen's compensation insurance will in all probability be equally applicable in case unemployment insurance becomes important.

The actual notation presented is simple and convenient to use. Approximately a score of symbols are sufficient to cover the most important formulæ now in use. The device of using EP to represent expected losses and nq the number of claims tends to simplify matters and keep the number of symbols at a minimum. If the EP is to represent expected losses, then P , the premium, will have to be defined, that is, distinguished as between earned premium and premium at current rates. It seems to me that the expression for payroll, $100n$, might have been included in the list and probably replace the symbol for the constant in the experience rating credibility formula, K , which is not used to any great extent. Another possible substitution might be made for the off-balance factor, B , which although still in use in the states of North Carolina, Texas and Wisconsin, could advantageously be replaced by a symbol representing the factor introduced to correct for the off-balance of rating plans. But such changes are largely a matter of individual preference which may be influenced by the amount of use to which the symbols are put by the individual.

The paper is really a practical contribution to the literature of the Society and regardless of whether or not any standard system

of notation is adopted, the symbols presented should be used wherever possible and to as great an extent as is practical in order to obtain greater uniformity in technical terms.

MR. N. M. VALERIUS:

"The editors of several mathematical journals have agreed upon the following suggestions. . . . In typewritten formulas, . . . 0 means zero. For capital *O* backspace and overprint period *Q*." Thus would they avoid the dilemma Mr. Carlson's memorandist contrived. They have another suggestion for a predicament of the same kind that has at some time bothered the reviewer. "1 means one. Backspace and overprint *I* for ell".

The subject of the paper, fortunately occasioned by this unfortunate dilemma, is deserving of attention and I believe that Mr. Carlson's effort will have actual results, if not to the full extent that a standard set of symbols should be adopted by the Society. The conservative basis of Mr. Carlson's suggestions insures a degree of success for them. He is attempting to establish as a code the most appropriate or the most widely recognized symbols previously used for each of the various actuarial notions, in accordance with his criterion "(3) foundation upon symbols already generally accepted and used", meanwhile requiring that such symbols shall pass inspection in the light of "(1) simplicity and (2) universality, that is, applicability to all casualty lines". There are other criteria not so formally insisted upon—availability for the office typewriter and agreement with mathematical usage. Incidentally, the use of mathematical relations has avoided ambiguities in past usage and the setting up of several additional terms, e.g., the selection of *EP* for expected losses, being expected loss ratio \times premium, and $1.0 - E$ for expense loading. This last might be written into the List of Basic Symbols by the members for convenience of reference.

The innovations are few and well considered and generally supply specific lacks in past usage. Certain substitute symbols have been suggested where those in use conflict with the criteria. The thorough-going insistence on the basic distinction between elementary and delimiting symbols is, of course, new and entails some new symbols as C_L and C_E for loss and expense constants.

One desideratum, that the symbol be suggestive of its meaning, is not mentioned, although it is acknowledged in fact. In this connection, it might be said, only English-speaking actuaries and American usages are considered, but with the present almost complete lack of international relations in casualty insurance technic nothing more is practicable.

I have no deep-seated disagreements with the choices of symbols to record. It seems possibly unnecessary, when L is defined as "Actual losses", to have a subscript a for actual unmodified losses, i.e., $L = L_a$, or, further, L might possibly have been defined as Losses, with sub i (incurred) for actual, or no sub-symbol, sub m for modified, and sub a for adjusted, thus saving the basic concept, losses, from appearing twice in the list of basic symbols, in what might be looked upon as two delimited senses, as L and A . This is, in fact, the only such duplication except loss ratio and expected loss ratio, but expected loss ratio is of so very frequent occurrence and so fundamental a notion it is in a class by itself. There would be another advantage in this, that if experience rating plans were being considered where the comparison between the risk experience and classification experience is made on a premium or pure premium basis instead of loss basis, P_a and p_a would be available symbols. Plan D in compensation had an item, "Adjusted Premium". The burglary plan's experience comparison is on a premium basis, though the concept of adjusted premium is not at present used since the calculation is in terms of deviation and the final modification is a deviation, equivalent to $1 - M$ in the standard notation. It might be convenient to describe the essential equation of that plan as $M = P_a/P$, in line with the notation of other plans.

Perhaps the choice of v to represent the decimal portion of the rate to be proportional to the total rate could better have been g . The letter v as an interest function is a fundamental term. The notion of *graded* expenses would be as good as *variable* expenses, the letters f and g (the two kinds of expenses with this notation) occur together in the alphabet, and the only paper in the *Proceedings* dealing with deductible and excess coverages, Dorweiler—Vol. XIII, gives g the claim of previous use.

It would have been desirable if Mr. Carlson had suggested a standard way to delimit the symbols with respect to time periods and territories or other experience limits involved. Occasionally

such delimiting symbols are useful, for instance, where calculations are made on several experience periods and the results compared for selection between them.

Possibly certain of the symbols might be given a wider definition. F seems to be intended as the symbol for any factor to correct, adjust, or modify, whereas its listing as "Correction factor (for general purposes)" might imply the narrower meaning correction factor has, that of a final reconciling adjustment. The two expense loading symbols should be considered available in other connections than deductible average and excess insurance.

Certain of the symbols will not be of one meaning in casualty practice, when brought together with the accident and health symbols, and annuity symbols, but there would be no confusion in use. For instance, E , v , and $1 + a$ would have other meanings in those connections.

I note two errors in the lists of symbols. M for merit-rating decimal modification of a rate should be added to the list of basic symbols. Incidentally, $1 - M$ is referred to as discount in the discussion. It is, of course, sometimes negative and not discount. The final symbol of the paper should be $L_{n:m}$ not $L_{n=m}$.

The brevity of Mr. Carlson's paper belies the amount of careful research and discrimination which a review of the problem reveals. It is seen, on reflection, that certain seeming omissions, as, for instance, a reserve symbology, must await further crystallization of ideas. I believe the members of the Society will be pleased to use the symbols suggested. Perhaps the adoption of an official standard notation should wait upon a period of tentative uniformity on this basis.

There is in the records of the International Actuarial Congresses a resolution voted unanimously on May 19, 1898 "That a Universal Notation be adopted, not only for Life Assurance, but for all other branches of assurance;". It was probably the main thought of the resolution to include accident and health insurance. Some of the casualty lines of great present importance were hardly in existence anywhere at that time. It may be hoped the result of Mr. Carlson's paper will be a fulfillment, in some measure, of the letter of the resolution of 1898.

AUTHOR'S REVIEW OF DISCUSSIONS

MR. THOMAS O. CARLSON :

Mr. Smick expresses doubt as to the advisability of establishing a standard system of notation, and suggests instead the presentation of "occasional papers on the subject in which analysis of customary and criticism of poor or ambiguous terminology can be made". The author has little sympathy with such a suggestion for several reasons. His paper was written in the hope that present conflict and ambiguity along this front would be eliminated. Additional papers by this or that member expressing individual and almost certainly dissenting views, without a standardizing body of any kind, could only add to the present confusion and uncertainty. Furthermore a discussion of two or three symbols is hardly a subject worthy of the distinction of being presented as a paper. The author also feels that Mr. Smick over-emphasizes the effect of time on symbols. Most of the symbols discussed in the paper are for fundamental terms which have always been part and parcel of casualty actuarial work and will continue to be so; many terms that could have been included were excluded because the author doubted their permanence. It was pointed out that the individual memorandist may have to use his own special symbols for the more uncommon terms.

The suggestion of Mr. Smick to include the payroll symbol in any final listing is a good one and the author also agrees that B may not be the best symbol for the off-balance factor. He is open to any suggestions for a satisfactory substitute, barring the use of O .

Mr. Valerius also has suggested certain additions and changes which are desirable, such as the inclusion of the expense loading symbol in the table, the use of g instead of v for the functional expense loading, and the use of L for losses, with subscript m for modified and subscript a for adjusted. Note should also be made of the two errors he lists; $1 - M$ should be referred to as "discount or charge", and the subscripts in the final symbol in the table should be in small letters.

The author disagrees, however, with Mr. Valerius' proposal to include delimiting symbols with respect to time periods and territories. If a system is too heavily laden it will not be used:

this is one reason why Mr. Perkins' earlier suggestions along the same line have not had greater influence. Such symbols are needed very infrequently, and where they are needed the individual author could use whatever symbols are most convenient for him, explaining them as he introduces them.

The author still feels it would be desirable for the Society to sanction some table of the important symbols, not necessarily the one proposed, but one agreed upon by a group selected for that purpose. This group or committee could receive suggestions for additions, deletions and changes, and decide upon them without any necessity of airing pros and cons through papers. Such action would constitute a step in the direction of facilitating discussion and reading in connection with the problems of casualty actuarial science.

VALUATION OF INVESTMENTS—JOSEPH J. MAGRATH
VOLUME XX, PAGE 281

WRITTEN DISCUSSION

MR. FREDERICK RICHARDSON :

This is a valuable and timely contribution to our *Proceedings*. The facts have been ably presented by Mr. Magrath and the implications to be drawn therefrom have been left mainly to his readers. He has in my opinion completely justified the action of the National Convention of Insurance Commissioners in seeking to solve the problem of valuation by easy stages even though the solution rested upon a theory of market values that is open to criticism. The line of greatest safety was not along the lines of a narrow conservatism. It seldom is. As for the amortization of bonds it was an innovation, at least for Fire and Casualty Companies, and entirely warranted in the circumstances; but further studies are called for before it can be permanently adopted, such as studies of probable speeds of liquidation of liabilities in relation to income, and probability and effect of catastrophic losses. He has not attempted to lay down hard and fast rules for the future. Naturally there crops out of this paper the question of the regulation of investments which might well be the subject of

another thesis. There is no reason to believe that the matter has been settled now the crisis is over. We have to admit that similar emergencies will arise again, and although the method of meeting them is becoming stereotyped, there is need of settled practices that will lessen the necessity for exceptional treatment in the future.

The interest income on reserve funds is a function of the underwriting process, and the highest standards of investment practice are logically called for where the standard of underwriting is lowest. However, we know that this is most unlikely to obtain, as looseness of practice in one field usually goes with looseness in the other. We have for practical purposes to assume a single standard that will protect the public against the weakest organizations. It would be little use trying to apply a sliding scale as ultimately the best companies would not be satisfied with anything but the highest standard of investment practice for themselves. Of course, there is bound to be some difference of opinion regarding suitable statutory requirements. We have heard from Mr. Fortington (Vol. XII, page 294), and Mr. Tarbell (Vol. XIII, page 110), on the subject of desirable investments for Casualty Companies, but though times have changed it can be stated that the main assumptions of that discussion have been borne out, particularly those of Mr. Tarbell.

After a long period of expansion it would seem that the field of high-class bond investment is contracting. Along with this there is a growing demand for the more desirable securities from approved standards of safety. We are not only entering a market where the growing funds of Life Insurance Companies play a tremendous part but we have to compete with savings banks, trustees, industrial concerns and endowed institutions of all kinds, to say nothing of the wealthy income tax dodger. We are definitely in a low yield era when all of our instincts will be crying out for the widest field of investment to support interest earnings. If underwriting profits go up, well and good; if not then our troubles are not over by any means. At present America has a surfeit of money. It is estimated that over five billion dollars are waiting employment and earning nothing. A marked improvement in railroading and in big business generally would ease the situation and make it more tolerable. It would have the effect of reconditioning depressed railroad bonds and at the same time

bring about a dearer money market which would reduce the present phenomenally high prices for all high grade securities. The administration in Washington is interested in keeping money cheap until the needs of the national government are satisfied. This stage may be reached quite early or quite late. Who knows?

But when the Insurance Commissioners meet in December they might as well collate the statutory requirements of their respective States in reference to the investments of Fire and Casualty Companies, as they will have to make up their minds regarding what should be done to prevent a repetition of the worst features of investment depreciation in the past as they affected the insurance business. In Great Britain, where there is very little State regulation, it is customary to carry all securities at book value and to set up funds for depreciation. By this method boom values are flattened out and depressed values are covered wholly or partly by reserves. I mention these practices for what they are worth without wishing to argue their suitability for American conditions. However, I am inclined to believe that contraction of the field of investment is not so imperative as conservative valuations plus stabilization of funds. The subject of investment in stocks might be handled quantitatively as well as qualitatively. The better control of security markets and investment issues of all kinds now in process of development should lessen the need for contraction. Greater stabilization of prices and an increasing demonstration of values are bound to result, and this will make for greater safety over the entire range.

CORRECTION OF CERTAIN DEFICIENCIES IN THE EXPERIENCE RATING
PLAN BY THE SO-CALLED "ACCOUNT CURRENT" METHOD—

WRITTEN DISCUSSION—MARK KORMES

VOLUME XX, PAGE 350

WRITTEN DISCUSSION

MR. J. M. CAHILL :

Mr. Kormes' review of the writer's original discussion of this paper contains several statements with which the writer does not agree and hence has led to a continuation of the discussion. Mr. Kormes states that the credit off-balance of the compensation experience rating plan has been steadily increasing in New York, probably largely because of loss underestimates. He considers

that the insurance companies are short-sighted in refusing to recognize this situation and estimates that the annual loss in premium volume resulting from the underestimating of losses on rated risks is in the neighborhood of \$1,000,000. These statements deserve further analysis and comment.

In New York it is not contemplated that the compensation experience rating plan will be in balance. The compensation rate making structure in New York provides for the determination of a manual level which when reduced by a certain expected credit off-balance will reproduce a selected collectible level for rated business. In other words, the rate making structure is such that a sizeable credit off-balance is expected and, unless the realized off-balance exceeds the expected off-balance, the companies suffer no actual loss of premium on rated business. A comparison of the actual off-balance determined from experience rating statistics with the expected off-balance on rated business for the three most recent policy years is given below :

Policy Year	Actual Off-Balance	Expected Off-Balance
1931	7.3% Credit	9.3% Credit
1932	6.9 "	8.0 "
1933	8.3 "	8.0 "

It appears from this exhibit that in recent years the companies have not suffered any loss in premium from an excessive credit off-balance on rated business. The actual result for policy year 1933 is slightly in excess of the expected, but this tendency was probably corrected at the July 1, 1934 rate revision when the actual off-balance data for policy year 1933 were used as the basic figures in calculating the expected off-balance in terms of the revised manual rates.

Mr. Kormes is correct in his statement that in the past there has been no general provision in New York for the development of the losses used in experience rating to an ultimate basis except insofar as this may have been recognized in that the payroll modification factors have been calculated to discount the average cost at new rates to the level of the experience period. Since the rate making structure contemplated a definite credit off-balance which was determined on the basis of the latest available experience rating statistics at the time of each rate revision, however, it follows that there was no need for the introduction of such

loss development factors. In order that the actual off-balance should reproduce the expected off-balance, all other conditions being equal, it was essential that the method of calculating the factors of the experience rating plan should remain unchanged.

At the July 1, 1934 rate revision in New York, however, loss development factors were definitely included in the experience rating plan. The effect of the factors is included in the payroll modification factors and not in the loss modification factors, but as a practical matter it makes no difference whether the loadings are applied to the actual losses or whether the reciprocals of the loading factors are included in the payroll modification factors. The effect is exactly identical with either method.* A factor of 1.031 was adopted for policy year 1932 in order to provide specifically for the ultimate development of losses underestimated in the first reporting. This factor was calculated on the basis of the development of loss ratio data experience beyond 24 months. This experience has shown a less substantial development, however, than has the experience reported under the Unit Statistical Plan. In comparing the loss ratios for the earlier years with the adopted rate level loss ratio, the actual undeveloped losses of policy year 1931 on a first reporting basis, of policy year 1930 on a second reporting basis, and of policy year 1929 on a third reporting basis were used. In the experience rating calculation, the second reporting for policy year 1931, the third for policy year 1930 and the fourth for policy year 1929 are actually being used. From the foregoing, it is obvious that the factors being currently employed in experience rating New York risks include sizeable loadings for loss underestimates.

It is the writer's opinion that there is theoretically no need for the inclusion of loss development factors in the experience rating plan because the New York compensation rate making method contemplates a definite off-balance. If, in the interest of conservatism, it is considered desirable to give definite recognition to the fact that losses are underestimated on the average in the earlier reportings of experience, the logical method of making this adjustment is to include proper average loadings in the experience rating plan along the general lines followed at the July 1, 1934 rate revision. It is obvious that if the "account

* "Recent Developments in Workmen's Compensation Insurance Rate Making," by W. F. Roeber, *Proceedings Casualty Actuarial Society*, Volume XV, page 230.

current" method were introduced, it would be necessary to make such adjustments in the existing rating structure in order to avoid doubling up on this phase that the companies would not benefit in the least from the introduction of this method. The effect of the elimination of existing factors would offset any benefit in premium derived from the "account current" method.

Even if it were logical to assume that the companies would benefit in any degree from the introduction of the "account current" method, Mr. Kormes' estimate of an increase in annual premium volume of approximately \$1,000,000 is seriously in error. This estimate was apparently derived as follows:

Where: \$50,000,000 = annual premium volume.

.70 = proportion of premium volume which represents rated business.

.55 = average credibility of rated business.

.05 = estimated loss underestimate of first reports under Unit Statistical Plan.

$$\$50,000,000 \times .70 \times .55 \times .05 = \$962,500$$

Mr. Kormes has apparently assumed that the loading of 5% which he considers to be necessary to develop first reporting losses to an ultimate basis is likewise required in the case of the earlier years where the losses used in experience rating are actually on a second, third and fourth reporting basis respectively.

If this calculation is made correctly giving recognition to the trend plan and using the loss development factors employed by the National Council in preparing the New York classification experience for the July 1, 1934 rate revision, the corresponding premium indication is only \$539,000:

Unit Reporting	Trend Weights	Indicated Loading for Subsequent Development	Product (2) × (3)
(1)	(2)	(3)	(4)
4th	.25	.000	.000
3rd	.50	.010	.005
2nd	.75	.027	.020
1st	1.00	.045	.045
Total	2.50		.070

$$\frac{.070}{2.50} = .028 \text{ average indicated loading}$$

$$\$50,000,000 \times .70 \times .55 \times .028 = \$539,000$$

The New York size of risk tabulations compiled from successive reportings indicate that the experience of rated risks develops no more adversely than that of non-rated risks. For this reason, it seems proper to use in this calculation the loss development factors employed in determining manual rates. Even if a 5% loading were used in connection with the losses of the first reporting with a proportionate increase for the earlier years, Mr. Kormes' estimate would still be over 60% too high. This calculation has been included merely to point out that Mr. Kormes did not take into account the fact that smaller loadings than 5% would be in order for the early years. It in no way modifies the statement made previously that the introduction of the "account current" method would not serve to increase the total premium volume.

Mr. Kormes' footnote referring to the introduction of a flat factor of 1.05 to be applied to the actual losses through the medium of the loss modification factors is entirely irrelevant to this discussion. This factor is an integral part of the rate level calculation and, whether it had been adopted or not, the selected collectible rate levels for both the rated and the non-rated groups of business would have been identically reproduced. The adoption of this factor served to decrease the expected off-balance with the result that a lower manual level was adopted than would otherwise have been the case. The adoption of a lower manual level necessarily meant that higher loss constants were indicated for non-rated risks than would have been the case if the 1.05 factor had not been adopted. The effect of adopting this factor was to decrease the manual rate level by more than 4% and to increase the loss constants by more than 35% on the average as compared with what would otherwise have been adopted. The collectible rate level for either rated business or non-rated business was not changed by the inclusion of this factor.

Finally, let the writer conclude by stating that it was not his intent to imply a chronological order of events when he used the word "following" at the top of page 347. Unfortunately, however, he used the word "following" with the meaning of "employing".

REVIEWS OF PUBLICATIONS

CLARENCE A. KULP, BOOK REVIEW EDITOR

Mortality of Assured Lives, 1924-1929 (Monetary Tables). Vol. I.

The Institute of Actuaries and the Faculty of Actuaries in Scotland. Cambridge University Press, London, 1934. Pp. xxxix, 339.

The appearance of this volume, giving the results of the most recent major investigation into rates of mortality of assured lives, was indeed welcome. These tables give the combined experience of some 52 life companies doing business in Great Britain over the 6-year period, 1924-1929, inclusive.

The main portion of the book, containing 339 pages, gives the monetary tables at the following rates of interest: 2%, 2½%, 2½%, 2¾%, 3%, 3¼%, 3½%, 3¾%, 4%, 4½%, 5%, 5½% and 6%. At each rate are given the values of the following functions—the select period being taken as three years— $\log D_{[x]} D_{[x]}$, $D_{[x]+1}$, $D_{[x]+2}$, from ages 10 to 80 inclusive, and D_{x+3} , and $\log D_{x+3}$, from ages 10 to 99 inclusive. Similar tables, over the same range of ages, are given for the functions N , C , M , and R , while in the case of the S function, columns of $S_{[x]}$ from $x = 10$ to 80, and of S_{x+3} from $x + 3 = 10$ to 99 are included. There follow tables of select values of $a_{[x]}$, $A_{[x]}$, $P_{[x]}$ from $x = 10$ to 80, and ultimate values a_x , A_x , and P_x , from $x = 10$ to 99. An extensive table of term annuities is given at all even ages from 16 up, both on the select and ultimate basis, for terms from 1 to 78 years inclusive, where the longest term for each age is such that the annuity ceases at age 94. There follows on both select and ultimate bases an equally comprehensive table of endowment insurance single and annual premiums (and corresponding annuity values $a_{[x]:\bar{n}-1}$ and $a_x:\bar{n}-1$), for policies maturing at all quinquennial ages from 40 to 75 inclusive. These values are given for all ages from 16 up, and for all durations such that the sum of the age and the duration equals 40 in the first table, 45 in the second, . . . 75 in the last.

The introduction to this volume, consisting of 39 pages, contains much interesting matter regarding the sources of the mortality tables upon which the monetary tables described above were based. The mortality tables are given on pages xxxii to xxxix inclusive. The values of $\log \dot{p}_x$, $\dot{p}_{[x]}$, $\dot{p}_{[x]+1}$, $\dot{p}_{[x]+2}$, are

given from ages 10 to 80, and for p_{x+3} and $\log p_{x+3}$ from ages 10 to 99. Similar tables are given for each of the functions l_x , d_x , q_x over the same range of ages. These tables also include values of $\log \mu_{[x]}$, $\mu_{[x]}$ and $e_{[x]}$ from ages 10 to 80 and values of μ_{x+3} , $\log \mu_{x+3}$ and e_{x+3} from $x+3 = 10$ to 99.

After a careful examination of the statistics the committee in charge decided to issue monetary tables based upon a combination of all the data for those medically examined and those not medically examined, and for all classes of policies. This was probably advisable as most companies use the same mortality tables for all classes of business if possible. At the present time participating endowment assurances is the largest class of business in Great Britain, but mortality experience under this class alone, being lighter than under any other class, would not give a suitable basis to use for all classes of policies. In preparing the select tables the select period is taken as 3 years, thus simplifying considerably the tables and effecting a great saving in computations based thereon.

After unsuccessful attempts to graduate the original data by Makeham's First and Second Modifications of Gompertz' Law, the ultimate table or the table for "3 and over" was graduated by Spencer's 21 term formula, adjusted at both ends as is always necessary when graduation is made by the use of a summation formula. A simple rule was found to hold for the select table values leading up to the ultimate table.

A number of tables are included which make comparisons, at quinquennial ages, of certain annuity values, assurance values, annual premiums and policy values, with those of the O^M and $O^{[M]}$ tables which were based on the experience of British Life offices from 1863 to 1893. The new tables show a lighter mortality than the old. Premiums based on the new tables are somewhat lower than those according to the $O^{[M]}$ table. Policy values, so far as whole life assurances are concerned, will probably be not very different from those based on the O^M table. The writers warn the practising actuary against using these tables too freely without very careful consideration as to their applicability to the problem he has in hand.

On pages xxviii to xxxi are set out very clearly and explicitly the methods used in constructing the various mortality and monetary values given in the tables. Values were in general

computed to 2 more significant figures than are given in the tables. This part of the book is worth very careful reading, especially by students who are anxious to learn just how tables in their final forms are obtained from the original data. The tables have a good appearance, are clearly set up, and are so arranged that the maximum of valuable information is given in as few as possible number of pages.

L. A. H. WARREN.

Security Analysis. Principles and Technique. Benjamin Graham and David L. Dodd. McGraw-Hill Book Co., New York and London, 1934. Pp. xi, 701.

In these days of post-war disillusionment when all fundamentals and values are being carefully reconsidered and a new order is in the making, there is need for a critical review of the principles and practice of security analysis. The abstract theories and dogmas of speculative enthusiasm must be replaced by realistic analysis of investment essentials.

This book is intended for the conservative investor who wishes to buy cheaply and with a view to safety rather than speculative profits. For such the book will provide techniques for discovering bargain issues. Special attention is given to privileged senior issues so extensively developed in recent years. There are chapters devoted to income bonds, guaranteed securities, convertible issues, warrants, protective covenants and remedies of senior security holders, and supervision of investment holdings. The authors put less faith in common stocks. They point out the arbitrariness of corporate dividend policies. High rates of dividends may create fictitious market values, but piling up reserves and surpluses and plowing back earnings for reinvestment frequently result in losses of income which the common stock owners are seeking. The questionable policy of withholding earnings seems to have grown out of the stock-watering practices of pre-war days.

The chapters on income account, amortization, depreciation, depletion and the now exploded earning power theory for appraising common stocks are worthy of veteran Wall Street security analysis. An interesting proposition is that the value of an enterprise can be altered through arbitrary variations in capital structure. The authors believe that the best distribution of capi-

talization between senior securities and common stock includes "senior securities to the extent that they may safely be issued and bought for investment." The stockholder's dollar is more productive if a reasonable part of the capital is borrowed.

Other features deserving mention are the shrewd observations on low-priced common stocks and the admirable treatment of the perennial subject of balance-sheet analysis. The book is in general well done, but is deficient in that it gives too little attention to inflation and its possible effects upon the different classes of securities. Several hundred investment hints and observations on widely held securities make this book important even if you disagree with the authors' conclusions.

CHARLES S. FORBES.

The Practical Application of Investment Management, Vol. 2.
Dwight C. Rose. Harper & Brothers, New York and London.
1933. Pp. 286.

The profession of investment counsel has existed for many years with great success in England and France. It is not surprising therefore that since the World War there should have become established in this country several pioneer firms constituting "a body of men free to consider the investment problem as a whole, without one-sidedness either toward the interests of industry on the one hand, or toward the peculiar point of view and philosophy of the investment banker on the other".

From 1922 to 1931 the author was associated with the firm of Scudder, Stevens and Clark. Many of the studies brought forward in this book were "originally started under the auspices of that firm". The author is now with another firm.

This book made its appearance on April 1, 1933, at a time when there was a sudden and strongly aroused public interest in investment problems. The time could scarcely have been more auspiciously chosen. It is a supplementary volume to the same author's *The Scientific Approach to Investment Management* published in 1928. The author claims that the sequel "is not a hindsight revision aimed to trim sails more expertly for the approaching financial rough weather of 1929-1933". "To smooth over or cover up the shortcomings of previous explorations in investment theory and management would certainly mislead the less critical reader into believing that our analyses and judgments

had more nearly anticipated the trend of events than the currently recorded writings have indicated."

In Part III and in the tables and charts in Appendix IV the author attempts to show that 5 investment counsel funds (unnamed) in terms of thousands of dollars were more skillfully managed than the investment funds of five leading fire insurance companies (named) in terms of millions of dollars. The author concludes that the return for both managements was superior to the "rate of riskless rent", i.e., the return currently obtainable from short-term U. S. Treasury Certificates or prime commercial paper varying between $6\frac{1}{2}\%$ to 3% in the period January 1, 1920 to December 31, 1930. The fire insurance company investment experience tables, showing the results for principal invested in 1920, were not prepared from the annual reports of the companies as published in Best's Insurance Reports, but from some other source not named. It is interesting to consider why the author has not extended in this supplementary volume his statistics in full beyond the year 1930 (the figures for 1931 are very incomplete).

The superior merits of investment counsel management as compared with that of insurance companies are attributed to the superior wisdom of the former in placing a greater proportion of their funds in common stocks. The chart on page 267 shows the 5 oldest investment counsel firms still carrying more than 55% of their funds in common stocks in 1930 after having experienced a 20% reduction in the amount of principal in the preceding 2 years.

On this question of what proportion of the investment portfolio should be invested in stocks and bonds Appendix 1 purports to show a reprint of *Common Stocks at the Current Price Level*, an address by Mr. Rose at the joint annual meeting of the American Statistical Association and The American Economic Association, Chicago, December 27, 1928. Actually the republished version differs in several particulars from the original pamphlet edition of the address, which may be found in the public library. The author was a pretty good financial Cassandra in December 1928, but not quite as good as he would have the reader believe. The qualifying remarks in his original pamphlet have been deleted and the weak points scientifically reinforced in the reprinted version.

For example, on page 159 we find the following: "If, however, the combined influence of changing commodity prices and changing interest rates should be reversed over the next few years, this might operate to the distinct advantage of the holder of common stocks." This is now followed by an additional sentence inserted in the republished version but not appearing in the original: "Ever since the World War these two factors have presented a threat to the level of common stock price, a threat which was only partially removed during the deflation of 1920-1921." On page 160 of the republished version the following qualifying remark is omitted: "(If, however, new money reinvested by corporations should continue to earn on the average 12 per cent, while the market value of their shares is continuously inflated to a 6 per cent earnings basis, it would under such conditions be possible for the trend of market appreciation to continue undiminished, but the rate of current income would continue only about half that realized during the past quarter century.)"

The chief merits of the book are the charts of divergent trend series for stocks in each industry as compared with all stocks. These charts are taken from Standard Statistics. The greatest weakness of the book is that it lacks thoroughness and fails to convince the reader of its thesis: the advantage of investment counsel.

CHARLES S. FORBES.

Insurance Funds and Their Investment. F. W. Paish and G. L. Schwartz. P. S. King & Son, Ltd., London, 1934. Pp. x, 117.

This little volume deals with the subject of how insurance companies come into possession of immense sums for investment, and the principles governing the way in which these funds are invested.

In the preface the authors, who are Lecturers in Commerce in the University of London, state that their interest in this subject arose out of their studies in industrial finance. An analysis of the sources and forms of the supply of capital to industry showed that the very important part in the capital market played by insurance concerns made imperative a study of these institutions. The authors discovered that there appeared to be no book, at least in English, describing the origin and nature of the resources at the disposal of insurance companies and relating these to their

employment. Available material is in scattered papers, mostly presented to professional associations and conferences, and it has been the authors' aim to coordinate this material for the general student of economic problems.

The first part of the book describes in non-technical language the origin and nature of the funds which accumulate in the hands of insurance institutions. In view of the fact that life insurance is by far the most important type of insurance in quantity of funds for investment, particular attention is given to the technical reasons why such considerable sums of interest-bearing funds accumulate for long periods in the hands of these companies. This leads to an analysis of the considerations which a life insurance company has to take into account in investing its funds: liquidity, yield and maintenance of the value of the funds. Attention is given to the character of the investments of life insurance companies in the United Kingdom and the United States, and the distribution of assets and investment policies of companies in the two countries are compared.

It is pointed out that because of the nature of insurance contracts the operation of the insurance business is affected by various factors over a long period and that any marked divergence in the force of factors assumed at the time a contract was undertaken may give rise to serious difficulties. The operation of various forces upon the business of insurance, particularly life insurance, is then illustrated by an analysis covering the forty years from 1890 to 1929. This period was marked by enormous price fluctuations affecting the adequacy of expense loadings on policies; by rising interest rates during the period 1890 to 1914 and more especially during the war period, with a corresponding fall in the value of existing fixed-interest securities; by an increase in the mortality rate during the war years and by problems arising out of currency depreciation during the post-war period.

The book concludes with a description of the investment experience of the companies in the United Kingdom and the United States during the depression years since 1929. A bibliography is presented at the end of the volume.

The work is commendably clear and concise and should prove of interest and value to the student of insurance as well as to the general student of economic problems.

HOWARD G. CRANE.

Reversions and Life Interests. H. J. Tappenden, F.I.A. Cambridge University Press, 1934. Pp. 56.

This is the latest volume in the Institute of Actuaries Students' Society's Consolidation of Reading Series. The two members in this series previously published are *Valuation and Surplus* by Lochhead, and *Friendly Societies* by Brown and Taylor. In the third number the subject of reversions and life interests is discussed in five chapters:

Chapter I—*Types of Security.* The various types of reversionary securities are discussed briefly under four headings; absolute reversions, contingent reversions, life interests in possession and life interests in reversion.

Chapter II—*Valuation Bases.* In the determination of the value to be placed on a reversion, the influence of three main factors is considered. The factors are:

- (1) The expected mortality of the life tenant.
- (2) The rate of interest which it is desired to realize.
- (3) The value to be placed on the trust securities. As an appendix to this chapter there is included a table showing A_x at 6% according to the Carlisle Table and Lever's Table, and $a(f)$ and $a(m)$ Ultimate Tables at both 6% and $5\frac{1}{2}\%$.

Chapter III—*Valuation Methods.* This chapter deals with the methods and formulæ available for determining the value to be placed on a reversion.

Chapter IV—*Loans on Reversionary Interests.* Methods for determining the loan values of reversions are discussed.

Chapter V—*Office Administration.* This chapter discusses a number of administrative problems which arise in the company offices.

This volume is not intended to take the place of the material recommended for study to the candidate for the Institute Examinations. In a foreword the editor states, "The theoretical problems of the valuation of reversions and life interests should present no difficulty to the student who has passed the second part of the Examinations of the Institute of Actuaries, but the practical application of the theory to the problems which present themselves in every-day work involves special considerations which have little or nothing to do with the formulæ of the text-

books. The reading available to the student is limited and it is hoped that this volume will assist him to obtain that practical grasp and outlook which every successful actuary must have."

A. Z. SKELDING.

Recent Developments in Industrial Group Insurance. National Industrial Conference Board. New York, 1934. Pp. 46.

Recent Developments in Industrial Group Insurance is a comprehensive and authoritative survey of the whole history of group insurance by the National Industrial Conference Board. It is a splendid bit of research work which will be found entertaining and informing by all interested in the subject of group insurance in its various phases: group life, group accident and health, group accidental death and dismemberment, and group annuities. The survey gives a resume of the history of group insurance, its general characteristics, the growth of the cover, the essential underwriting features, and recent developments in group insurance policies.

This brochure is the second revision of a study made by the National Industrial Conference Board in 1927 and revised the first time in 1929. The investigation was conducted by Mr. Kenneth Stillman of the Conference Board's Research Staff in cooperation with the 8 largest group insurance-writing companies. These 8 companies had in force on December 31, 1933, \$8,206,775,000 of group life insurance, \$744,129,000 of group accidental death and dismemberment insurance, \$15,974,000 weekly benefits in group accident and health insurance and \$8,435,000 monthly income in group annuities, approximately 90% of the total group insurance in force in the United States.

WILLIAM J. GRAHAM.

A New Plan for Unemployment Reserves. Alvin H. Hansen and Merrill G. Murray. Employment Stabilization Research Institute, University of Minnesota. University of Minnesota Press, Minneapolis, 1933. Pp. 75.

An Historical Basis for Unemployment Insurance. A Report Prepared for the Employment Stabilization Research Institute, University of Minnesota by Industrial Relations Counselors, Inc. University of Minnesota Press, Minneapolis, 1934. Pp. 306.

A Program for Unemployment Insurance and Relief in the United States. Alvin H. Hansen, Merrill G. Murray, Russell A. Stevenson and Bryce M. Stewart. Employment Stabilization Research Institute, University of Minnesota. University of Minnesota Press, Minneapolis, 1934. Pp. viii, 201.

These 3 volumes, prepared by the Employment Stabilization Research Institute of the University of Minnesota, in cooperation with Industrial Relations Counselors, Inc., contain a wealth of material in regard to "unemployment insurance and relief", and the Institute should be congratulated on the careful work it is doing in this field. Out of its studies there emerged in 1933 certain proposals by Professor Hansen and Murray, which they set forth in *A New Plan for Unemployment Reserves*. These proposals formed the basis of a bill introduced in the Minnesota Legislature in April 1933, which passed the House of Representatives but died in the Senate.

The primary purpose of the plan was to make provision for long periods of unemployment, especially such as have been experienced in the present economic crisis. Accordingly a maximum benefit period of 40 weeks in 12 months, with a possibility of 12 additional weeks in the second year, was proposed. Benefits of 40 per cent of earnings, limited to 1 week of benefit for each 4 contributions, were to be paid from a state reserve fund, with separate credits to individual industries or groups of industries out of which their own benefit liabilities would be paid. No benefits were to be payable until after a waiting period of 8 weeks, which in certain circumstances might be extended to 16. The rate of contribution was fixed at 4 per cent of the payroll of eligible employees, divided equally between employers and employees.

Though a long waiting period is to be expected in a plan which attempts to provide for long-term unemployment, it has been questioned whether one as long as 8 weeks will not eventually defeat the main purpose of any unemployment compensation proposal, which is of course to assist the unemployed. Some who have studied this problem doubt if many of the lower paid workers who would be covered by the plan would be able to tide themselves over an 8 week period, especially as the amounts earned in employment are often very low. While it is of first

importance to conserve the unemployment fund, the desirability of any method of conservation which works to the detriment of the unemployed is open to question. It was considerations such as these which apparently prompted the authors to halve the waiting period in a later revision of their plan.

Another distinctive feature of the original plan is the segregation on industrial lines of the reserve fund. It is also suggested that industries which have been able to build up a reserve equal to 12 per cent of their average annual payroll be allowed to reduce, or entirely eliminate, the payment of contributions as long as the reserve is maintained at this level. Experience seems to indicate that any attempt to handle unemployment compensation on industrial lines will encounter at least one serious difficulty—that of demarcation. Arbitrary definitions of various trades and classifications of workers will have to be established, and this task, as British experience with domestic service indicates, may involve considerable complexity.

A further point arises as to how far the establishment of industrial reserves will impede the mobility of labor between industries. This question is especially important in the United States where the movement of labor is more widespread than in Europe. One of the main considerations in segregating reserves by industries is, of course, to place the cost of unemployment compensation on the industries in which the unemployment occurs, in the belief that thereby they will be stimulated to reduce their unemployment. Doubt has, however, been expressed in various informed quarters as to whether the imposition on employers of a 2 per cent tax on payrolls will act as a greater incentive toward the reduction of unemployment than is provided by the struggle to maintain profits during the present depression.

In the volume entitled *A Program for Unemployment Insurance and Relief* the authors of the original plan and their collaborators, Professors Stevenson and Stewart, continue to emphasize provision for prolonged unemployment, but further study has led them to abandon the idea of reserves through individual companies and industries. They have also shortened the original 40 week benefit period to 26 and have reduced the waiting period from 8 to 4 weeks, unemployment persisting beyond this time being relegated to a special relief scheme. It is interesting to note such important changes of viewpoint, as well as recognition

of the problem of providing further assistance after exhaustion of the right to benefit under the "insurance" scheme. The experience of every European country, as the *Historical Basis for Unemployment Insurance* makes clear, demonstrates that the problem of relief in conjunction with any "insurance" scheme is one which cannot be sidestepped for any length of time.

The relief plan is expected to operate only in times of nationwide depression, when it is proposed to apply it exclusively to those who are covered by the "insurance" plan. Benefits of 30 per cent of wages, with a maximum of \$10 weekly, will be paid to all who can satisfy a need test, without a waiting period and for as long as 4 contributions can be proved beyond those offset by ordinary benefits. The cost of the scheme will be borne by the federal and state governments in the proportions of three-quarters and one-quarter respectively.

In addition to this tentative outline of a plan for emergency unemployment benefits, *A Program for Unemployment Insurance and Relief* contains a discussion of the fundamental considerations which arise in any unemployment compensation plan. These comprise a number of vital questions relative to the scope of coverage, contributors and their contributions, the definition of unemployment, eligibility for benefits, the benefits themselves, and finally the important matter of administration. There is also an interesting section on the investment of unemployment reserves with special attention to the maintenance of business stability. Some 8 methods of investment, and their effect on the expansion and contraction of credit, are discussed.

The *Historical Basis for Unemployment Insurance* furnishes a well-considered analysis of the development of this type of protection in Europe and in the United States. The provisions of the British, German, Belgian and Swiss plans are set out in parallel columns to facilitate comparison, as are also the legislative measures advocated or adopted in various states. The outstanding features of the company and joint plans initiated in this country are likewise compared in chart form. The work constitutes a comprehensive and well-arranged body of information which should be of value to students.

J. D. CRAIG.

Life Insurance Accounts. E. C. Wightman. Life Office Management Association. Pp. 281.

This book is apparently a revision and development of the previous book on the subject by Glover and Wightman. The plan and development of the book are similar and in some cases the phraseology is the same.

Almost any book written on insurance accounting might about as well be called *The Annual Statement and What to Do About It*. Two-thirds of Mr. Wightman's book is taken up with 7 chapters which relate to the annual statement blank. The book begins with a brief chapter on Fundamental Accounting Principles and Definitions. With due credit to Hatfield, he presents a clear and logical outline which one who has attempted the same task can fully appreciate. A second chapter, called The Principles of Insurance Accounting, might have quoted from the well-known essay on *Snakes in Ireland* for this chapter and those which follow illustrate that insurance accounting is a matter of practices rather than of principles.

Mr. Wightman, referring in his preface to the accounting practices of the life insurance business, says, "The main purpose of its accounting system would seem to be to furnish the Commissioners of Insurance with data that may be compared without any adjustment with information supplied by the companies in the beginning of the last half of the nineteenth century. The true purposes of modern accounting, namely, management control, seem to have been ignored." He could have added that the history of the development of the Convention annual statement blank shows that its original purpose was to provide the insurance departments with a basis for auditing the assets and liabilities of the companies while at the same time giving away a minimum of useful information to competitors. While this purpose has long been abandoned and exhibits and schedules have been added which make it possible for the initiate to get at least some idea of a company's operations, certain parts of the statement still stand as a monument to the ability of the founding fathers to provide a maximum number of figures and a minimum of information.

Mr. Wightman brings out effectively the characteristics of insurance accounting, both those that are inherent in the business

and those that are caused by the peculiarities of the annual statement blank. An accountant trained in other lines will find the section *The System and Basis of Insurance Accounting* in Chapter II of great value in coordinating his knowledge with the practices of insurance accounting.

In his discussion of the blank the author carries a running commentary on the theories and purposes back of each item, together with a very competent discussion of the moot points involved in the assignment of various transactions to their proper places in the statement. In his discussion of the gain and loss exhibit Mr. Wightman lays the ground work of the principles involved in the actuarial theory of the gain and loss items as a means of clarifying the interpretation of the data presented in the blank.

Mr. Wightman encounters the usual difficulty in showing on a rather small book page the reproduction of the schedules and exhibits of the annual statement blank reduced from their normal size.

Chapter X on the Evaluation of Assets contains a valuable discussion of the aspects of evaluation developed by the conditions of the past few years.

Chapter XI on Accounting Records and Procedures attempts merely to hit the high spots of the basic premium and policy loan records and the typical columnar arrangement for the various receipts and disbursement journals and claim register. The basic procedures are adequately explained and presented in usable form. Similarly the use of punched cards is treated briefly, covering the use of a general accounting card and an agent's commission card and showing a typical card of accounts with codes for punched card use.

The book is a valuable basic textbook and a useful guide to the insurance accountant in assisting in the logical assignment of items in the annual statement and in the preparation of the statement.

Mr. Wightman is probably wise in refraining from extending that part of the book dealing with accounting records and procedures. It would be obviously impossible, as the author points out "to lay out a complete accounting system which would be adaptable to the needs of all companies." It would be interesting, however, if some author with a taste for research would go

further into the subject of the mechanics of life insurance accounting. Some interesting work has been done along this line and it is probable that company accountants and comptrollers would welcome a presentation of some of the alternative methods possible under varying conditions.

ROBERT S. HULL.

Cases and Other Materials on the Law of Insurance. Edwin W. Patterson. Commerce Clearing House, Inc., New York, 1932. Pp. xviii, 840.

This work is designed for the use of law students. Its object is, not to set forth the subject of insurance law in all its manifold ramifications, but to indicate the main outlines of the subject, and to give the student enough to arouse his interest and to point out the way to study and investigation. This object is admirably attained. The work brings the reader in touch with many important points; and points not merely scholastic, but live controversial topics. Dull indeed is he who on running over Professor Patterson's cases, notes and problems is not stimulated to seek digests, law reports and statute books, and do some real research.

If the work can do so much for a student it has justified its existence. It is not possible in the confines of a single volume to give more than an indication of the wealth of available statutory and case material: but the reviewer hazards the opinion that a law student who will read this book, with particular attention to the annotations, and follow up the references to statutes and cases and familiarize himself with the textbooks referred to, will have acquired a very broad and satisfactory basis of insurance law and information. Close familiarity with insurance statutes and their interpretation, with insurance departments, with the vast and complicated detail of insurance contracts, with insurance carriers, boards, bureaus and affiliated organizations, with insurance agents and brokers, and with all the manifold ways in which the difficulties of any and all of these may reach the courts, must come mainly in the course of practice. The intention expressed in the preface of avoiding treatment of insurance law as unrelated sets of legal rules, and of seeking a synthetic treatment is admirable so long as one is a student. In practice it is not so easy to

avoid specialization. But one should seek to acquire as broad and comprehensive knowledge of the subject as possible as a preliminary to specialization. As is said in the preface the lawyer needs an understanding of insurance institutions and practices and of their place in the economic and social order. To be sure it is at present somewhat difficult to know what the economic and social order is for more than ten consecutive minutes. But the principle is all right, and not merely for the lawyer.

The reviewer hopes the author will not object to his evincing a greater interest in preface and notes than in the cases. The notes are detailed and comprehensive, and not infrequently lit up with a diction refreshingly picturesque. One recalls with appreciation such phrases as "the Jovian rumblings of Lorando v. Gethro"; "the seeds of the heresy from the orthodox doctrine of warranty"; "having found (or created) an ambiguity, the court proceeds to resolve it against the insurer"; "has the incontestable clause showered manna upon the insurer by enabling it to avoid jury trial of the issues of misrepresentation or fraud?" Reading a technical work is not such an easy task, and the author who makes the way easier by a little quip or touch of fancy is at heart a humanitarian.

More seriously, one is impelled to quote from the admirable note on State Supervision and Control. "Why (says the author) is the insurance business (that is, principally the insurance carrier) subjected to detailed regulations and supervision? What abuses or evils have stirred the legislature to action? What are the constitutional bases and limits (in the American system of government) of legislative power over insurance? What good (if one can ever tell!) has been achieved by regulations which could not have been achieved by a 'hands-off' policy?" These are 4 good questions for a student to answer, and if he gets good answers to the third and fourth, he will not lack for auditors. Further down one reads that "governmental control of rates is still in the United States one of the least effective phases of insurance regulation". This is sad news to one connected with that end of the business, but the author can find no little support among underwriters for that thesis.

Unfortunately the space permitted a review does not permit touching on all the points which tempt comment. In conclusion, let us turn to page 416 and read the forthright query there :

"Can you draft a statute embodying the features which seem to you desirable in such a way as to minimize the risks of judicial misconstruction and aberration?"

Can you indeed! Ah, Professor, the writer has known many who thought they could, and said they could; but his confidence would repose most readily in him whose answer to this query was couched in the form of a pious hope.

CLARENCE W. HOBBS.

Best's Automobile Policy Chart—1934. A. M. Best & Company, New York. \$1.50.

Best's Automobile Policy Chart, 1934, is an "analysis of the liability and property damage provisions of approximately 200 policies issued by the leading automobile writing companies." The analysis is confined to the two most important classifications of insurance written by automobile insurers: liability and property damage.

The provisions of each policy are tabulated under 66 general headings covering the usual clauses found in automobile policies. When the coverage or wording of an individual policy provision differs materially from that designated in the heading of the chart, the deviation is briefly expressed by reference notes. The number of such reference notes is one indication of the lack of standardization among policies.

The chart is particularly handy as a means of comparing the policy issued by one company with that issued by another company. A single glance at the chart forcibly indicates the need for a standard policy and shows at once the sub-standard coverage written by some carriers at reduced rates.

Very little comment can be made since the chart is simply a tabulation of policy provisions. A copy of the chart should be available in every company office writing automobile coverages as a means of familiarizing underwriters and agents with the variation in policies as at present written.

W. J. CONSTABLE.

Reviews of the following appear in *Transactions* of the Actuarial Society of America, Vol. XXXV, Part Two:

Death Rates by Occupation. Edited by Jessamine S. Whitney. National Tuberculosis Association, New York, 1934. Pp. 32.

How to Budget Health; Guilds for Doctors and Patients. By Evans Clark. Published for The Twentieth Century Fund, Inc., by Harper & Bros., New York and London, 1933. Pp. 328.

Monetary Policy and the Depression: A First Report on International Monetary Problems by a Group of the Royal Institute of International Affairs. Oxford Univ. Press, London: Humphrey Milford, 1933. Pp. vii, 128.

What Everybody Wants to Know About Money. A planned outline of Monetary Problems, by nine economists from Oxford. Planned and edited by G. D. H. Cole. Victor Gollancz, Ltd., London, 1933. Pp. 544.

The Art of Central Banking. By R. G. Hawtrey. Longmans, Green & Co., London, 1932. Pp. xii, 464.

A Critique of the Gold Standard. By H. L. Puxley. Geo. Allen & Unwin, Ltd., London, 1933. Pp. 272.

Reviews of the following appear in *The Record* of the American Institute of Actuaries, Vol. XXIII, Part Two:

Life Insurance Accounts. By E. C. Wightman. Life Office Management Association, 1934. Pp. xi, 281.

The Ancestry of the Long Lived. By Raymond Pearl and Ruth DeWitt Pearl. Baltimore: John Hopkins Press, 1934. Pp. 168.

Grundbegriffe der Wahrscheinlichkeitsrechnung (Foundations of Probability Theory). By A. Kolmogoroff. Berlin: Julius Springer, 1933. Pp. 62.

America's Hour of Decision. By Glenn Frank. New York: McGraw-Hill Book Co., 1934. Pp. 256.

Criteria for the Rejection of Observations. By Paul R. Rider, Washington University Studies, New Series, "Science and Technology," No. 8. St. Louis, 1933. Pp. 23.

The Federal Reserve Act—Its Origin and Problems. By J. Lawrence Laughlin. New York: Macmillan Co., 1933. Pp. 400.

Methods of Statistical Analysis in the Social Sciences. By George R. Davies and Walter F. Crowder. New York: John Wiley & Sons, Inc., 1933. Pp. xi, 355.

CURRENT NOTES

A. N. MATTHEWS, CURRENT NOTES EDITOR

PLATE GLASS EXPERIENCE RATING PLAN

An experience rating plan for Plate Glass Insurance was made effective October 29, 1934 by the National Bureau for use in the states of Iowa, New York, North Carolina, Oregon, and Hillsborough County, Florida. The plan is compulsory for all risks which develop for the ensuing year an annual manual premium of at least \$200, including that on valued glass, lettering and ornamentation. The experience period shall be thirty-three months, commencing three years prior and terminating three months prior to the effective date of the experience modification to be established. If experience for a longer period is not available, experience of not less than twelve months may be used in the rating. The plan requires that risks, or portions thereof, located in New York State shall be experience rated on the basis of New York experience only. For other states, the country-wide experience shall be used in determining the experience modification.

It is hoped that the present plan will avoid the imperfections which characterize the previous Plate Glass Experience Rating Plan. This plan became effective March 14, 1927 and was adopted by subscribers to the Moore Rating Bureau, as well as the members of the National Bureau. The New York Insurance Department claimed that the previous plan was "unenforcible and therefore not only impracticable but also unfairly discriminatory. It is unenforcible because owners and lessees whose properties are eligible for experience rating can procure the benefit of credits but invade the burden of debits." It is expected that the present plan will not be subject to the above criticisms and will provide a means of rating Plate Glass Insurance in the states where equity rating is not permitted.

COMMISSIONS REDUCED ON WISCONSIN COMPENSATION

An important precedent was established by the National Bureau of Casualty and Surety Underwriters in its decision to reduce the commissions paid by member companies on Compen-

sation business in Wisconsin, as a result of the refusal of the Insurance Commissioner of that state to grant the full increase in Compensation rates which had been requested. The National Council on Compensation Insurance had filed rates, developed by the newly revised rate-making formula, which were expected to produce an increase in average rate level of 14.9%. These rates were not approved, however, and it was necessary to file new rates which would produce an increase of only 5% in rate level. Since the stock companies had decided that they would not continue to write Compensation insurance in any state unless they obtained the full increases required for loss and loss expenses, the Conference on Acquisition and Field Supervision Cost of the National Bureau resolved to reduce the maximum production cost for Wisconsin from 17.5% to 11%. Maximum commissions for regional agents were reduced from 12.5% to 8%, and commissions for producers were reduced from 10% to 7%. These changes were promulgated to become effective January 1, 1935. It is expected that these reductions will enable the companies to write business at the approved rates, since the amount obtained for losses and loss expenses will be approximately the same as would have been produced by the requested rates.

PERSONAL NOTES

John L. Barter is now Superintendent of the Rating and Research Department, Hartford Accident and Indemnity Company, Hartford, Connecticut.

W. Phillips Comstock is now Statistician of the London Guarantee & Accident Company, 55 Fifth Avenue, New York.

David W. Miller is now Comptroller of the Title and Mortgage Company of Westchester County, 235 Main Street, White Plains, New York.

Joseph P. Gibson, Jr., is now Vice-President and General Manager, Excess Underwriters, Inc., 90 John Street, New York.

Daniel J. Lyons is now Chief Assistant Actuary, New Jersey Insurance Department, Trenton, New Jersey.

John H. Phillips is now with the Employers Mutual Liability Insurance Company, Wausau, Wisconsin.

Harry M. Sarason is now Assistant Actuary, General American Life Insurance Company, 1501 Locust Street, St. Louis, Missouri.

John J. Taheny is now engaged in the practice of law at 155 Sansome Street, San Francisco, California.

Milton J. Wood is now Assistant Actuary in the Life Actuarial Department, Travelers Insurance Company, Hartford, Connecticut.

LEGAL NOTES

BY

SAUL B. ACKERMAN

(OF THE NEW YORK BAR)

ACCIDENT AND HEALTH—ACCIDENTAL MEANS—EXCLUSIONS

[Order of United Commercial Travelers *vs.* Shane, 64 F. (2d) 55.]

The insured went to the office of duly and regularly licensed physicians for the purpose of securing a physical examination of the posterior urethra. In order to cause the patient as little discomfort as possible, the physician administered butyn, a drug having the same character and qualities as novocaine, as a local anæsthetic. Immediately, insured went into convulsions and died within a few minutes before the examination. The anæsthetic was properly administered and was a usual drug used for the purpose of inducing local anæsthesia without injury to the patient. Insured's death resulted, however, from an unforeseen unknown and unexpected idiosyncrasy or susceptibility to this drug—butyn.

The company contended that there was an accident in the means employed and that insured's death resulted while under medical treatment and not from medical treatment.

In ruling upon the question of accidental means, the Court stated that the deceased was insured, not against accidental results of intended means, but against death resulting from a bodily injury, effected directly through external, violent and accidental means. It may be proper enough, loosely to speak of the death as an accidental one; but the evidence, in our judgment, fails to show a death resulting from a bodily injury effected directly by accidental means.

"There was nothing in the act of administering the drug which was unintended or unexpected. There is no showing that the drug did not produce the intended result. But another result was produced owing to the idiosyncrasy of the patient. Counsel for beneficiary suggests that this idiosyncrasy was part of the 'means' employed. We cannot agree with this suggestion. The administering of the butyn was the means, the causative agency, employed by the insured through his agent, the physician; the idio-

syncrasy was but the condition which existed, and was inherent in the patient. There was no accidental means, but simply an unexpected or accidental result. The administration of the drug did not cause the idiosyncrasy, and, if the bodily injury which resulted in death, was produced by the idiosyncrasy as a cause or means, then the administration of the drug was not the sole cause, and there would be no liability under this policy."

AUTOMOBILE—OMNIBUS CLAUSE

[*Bakker vs. Aetna Life*, 264 N. Y. 150.]

A policy was issued to an automobile owner containing the following endorsements:

1. Coverage . . . for the liability of the owner of the motor vehicle therein described for negligence in its operation . . . by any person legally using or operating the same with his permission, express or implied to the extent that liability is imposed upon him by law.

2. The automobile described herein shall be personally driven by the named owner or by any person within the age limit provided by the policy when accompanied by such named driver.

3. Reimbursement clause.

A person was injured by the insured's automobile, but the individual driving the car was not accompanied by the named insured. A judgment was procured against the owner of the car and after execution was returned unsatisfied the injured party sued the insurance carrier. The question arose as to whether Section 109 of the Insurance Law, which provides for a compulsory omnibus clause in all policies issued in New York State, could be read into this contract, the provisions of which specifically excluded the type of coverage provided by the legislature.

The Court of Appeals in holding that the injured party was entitled to recover against the insurance company stated that the law was mandatory and that any insurance company which issues a policy without this provision violates the law. The Court in unequivocal terms held that should the provision be omitted, it will be read into the policy in order to give effect to this salutary regulation. It is true that the insurance company may refuse the risk and refuse to issue the policy, but once having done so

Section 109 attaches to it. The purpose of the provision is apparent. It is made for the benefit of persons injured or suffering damage and not solely for the benefit of the insured. The legislature in passing this section sought to correct an abuse of depriving injured parties of a just recovery against drivers who are indifferent to judgments and are execution-proof. Since the policy was written after the law was passed, it must be construed to have been written in accordance with law and, therefore, to have included this provision.

BURGLARY—CUSTODIAN ON DUTY

[Boesky Bros. *vs.* U. S. F. & G., 255 N. W. 307.]

The policy which was issued to an insured contained an endorsement that the coverage for robbery within the insured premises extended only while "at least one custodian is on duty therein".

The manager of the insured's restaurant closed the premises at 3:30 A. M. He took two of his employees to their homes and then drove to his own home about five or six blocks from the restaurant. As the manager alighted from his automobile, a man accosted him and forced him at the point of a gun to return to his car, drive back to the restaurant, unlock the door and open the safe. Under a threat of death the manager complied.

The sole question which was involved was whether recovery could be had under the circumstances stated, in view of the endorsement. Although ambiguities in policies are generally construed against the company, the Court stated here that it did not believe that there was any ambiguity in the language of this policy in the light of what actually happened. The plain meaning and evident purpose of the words "on duty" was that at the time of the robbery there should be someone on duty who might be able to offer resistance or give an alarm, thus minimizing the risk of loss. When the manager and his employees left the premises there was no longer anyone on duty therein.

The Court felt that when the manager later returned under the compulsion of a robber who pressed a revolver at his side, it could not be said that he was then on duty. He was no longer a free agent, but on the contrary an instrument or means of assist-

ance to the robber. He was no longer in a position to perform his duties which he had ceased to exercise when he first left the premises and, therefore, the insured could not recover.

COMPENSATION—NOTICE

[Fidelity & Casualty Co. *vs.* Board of County Road Commissions, 255 North Western 284.]

One of an assured's employees was injured on July 6th and quit work several days later after the pain became too intense, and notified his foreman that he had been injured. The employer however, failed to notify the insurance carrier of the accident or of the award which was made to the injured employee until approximately eighteen months thereafter, when an action was brought to recover the monies awarded by the Compensation Commission. The company did not notify the assured that it was not liable because of lack of notice, but defended the action, and after the award was confirmed and the money paid by the carrier to the injured employee, the carrier sought to recover from the assured the monies which it had paid out.

The Court held that the insurance carrier was estopped from denying its liability under the compensation policy since it did not notify the employer that it did not consider itself liable under the terms of the policy when it defended the action by the employee against the assured. The Court stated that the assured had the right to rely on the company's implied representation that it was assuming all liability under the insurance contract when it defended the suit, and since no denial of liability was stated by the company it is bound by its own acts.

FIDELITY BOND—"DISHONEST ACTS"

[Thomas *vs.* Standard Accident, 7 Fed. Supp. 205.]

A fidelity bond was issued to the receiver of a bank covering him against any loss sustained by him caused through any dishonest or criminal act of any of the employees.

The receiver had issued numerous dividend checks to the depositors of the bank which were to be presented by them to the bank's office and upon presenting a pass book and verified signature, the depositor would receive his money.

An employee of the receiver procured one of these checks and through some skillful means forged the depositor's name and obtained the money for himself.

The company inserted a defense that the acts of the employee constituted a forgery and that forgery was not covered by the bond. There were other elements of formal requirements of proofs of loss which, however, did not influence the decision of the Court.

The Court held that the transaction constituted more than a simple forgery. It stated that it was one part of a fraudulent scheme on the part of one of the employees of the receiver to make use of the forged signature and by impersonation, removal of the check from the files, and presentation by the wrong person, to secure from the receiver's assets certain funds. This was fraud—more than forgery—a breach of trust.

Since this is construed to be fraudulent conduct on the part of an employee, the fraud bond must be construed to cover in the instant case.

STEAM BOILER COVERAGE—EXCLUSIONS

[Travelers Ind. *vs.* Parkersburg Iron & Steel Co., 70 Fed. (2d) 63.]

A sharp question of fact involving the coverage under a policy presented itself when an engine connected with a steam line was wrecked. The insured contended that the wrecking was due to the pressure of steam in a cast iron steam separator; that the metal in the separator had become weakened by strain and vibration over a long period of time and that it gave way releasing the pressure on the water in the boilers; that this resulted in water being carried in to the cylinder of the engine; and that the water in the cylinder wrecked the engine.

The company contended that a piece of the piston-head of the engine was broken off and fell into the cylinder and that this caused the wreck.

If the insured's contention was correct the loss was covered by the policy as the coverage extended not only to the boilers but also the steam pipes connected therewith, including the steam separator and the company would be liable for the damage resulting from any breaking of the separator due to steam pressure.

If the company's contention was correct, the loss was not cov-

ered; as in that event the loss resulted from a breaking of a part of the engine and not from the pressure of steam in any of the appliances which the policy covered.

The Court held that this was a question of fact which could only be decided by a preponderance of the evidence, and it preferred to take the testimony of eye witnesses who corroborated the insured's theory rather than the highly technical hypotheses which were advanced by the insurance carrier. The Court placed the burden of disproving the insured's theory on the company and not being able to completely counteract this evidence, judgment was given for the insured.

SURETY BOND COVERAGE—LIMITATION OF ACTIONS

[*American Surety Co. vs. Martinez*, 73 S. W. (2d) 109.]

A fire company posted a qualifying bond upon being admitted to do business in the State of Texas. This bond covered a period extending for the calendar year of 1928. The fire company wrote a three year policy during 1928 and early in 1930 became insolvent.

A fire occurred in 1929 and the insured sued the fire company and obtained a judgment. By the time the judgment was rendered, however, the fire company had become insolvent and the insured proceeded to sue the bonding company on its qualifying bond posted during the calendar year 1928.

The bonding company contended that since the fire loss did not occur during 1928 it could not be held on this bond.

The Court, however, in holding for the insured, stated that by the laws of the State of Texas it was intended that the bonds provided for in the statutes should protect the payment of obligations arising upon policies issued by the fire companies during the year covered by the bond, and that it is not essential that the loss occur during the calendar year for which the bond is posted. If the policy was issued for three years, but nevertheless issued during the period covered by the qualifying bond, it is entirely immaterial whether the loss occurred during that calendar year.

The Court also stated that the surety company could assert any defense which the fire company would have had against the insured, as it stands in the place of and instead of the original insurance company.

REPORT OF THE COMMITTEE ON BASES OF EXPOSURE
FOR WORKMEN'S COMPENSATION INSURANCE

Following preliminary investigation and report, this Committee was created and empowered by the Council of the Society to investigate the various possible bases of exposure and to make recommendations for improvement in the present system of determining the risk premium, if the Committee shall conclude that the payroll basis be continued as the measure of exposure for workmen's compensation insurance.

In accordance with such authority and direction the Committee have investigated the historical background and development of the present system including the classification structure and rules of the rate manual and have carefully compared the same with statutory benefit provisions, the conditions of industry, economic trends and the various practical considerations which concern the conduct of compensation insurance. In the latter connection the Committee has availed itself of the interest and cooperation of a number of company officials with extended experience in the payroll audit field.

Discussion of the payroll basis is not new but has appeared from time to time and from a variety of sources. Recent discussions have been more frequent and somewhat insistently critical of the payroll basis as responsible in large part for the recent inadequacy of premium income. The question, then, of a basis of exposure, whether payroll or otherwise, might be examined separately as to adequacy, equitableness, dependability, stability and practicability of application. Being the established method of universal application subject to a few minor exceptions, the payroll basis should be maintained unless the possibility of securing definite and substantial advantage should be indicated through the adoption of one or more alternative methods. If the payroll method be found superior to such alternatives, then such errors or weaknesses as it may possess should be corrected so far as reasonably possible.

Inadequacy of premium income is attributable to a number of conditions largely arising from economic stress and change, but partly of natural and gradual development, among which the more important may be stated as mechanization of industry, in-

terpretations by courts and administrative bodies, extension of medical aid and increasing unit cost of same, re-opening of old cases, malingering and increased accident susceptibility and the sharp decrease of recent years in average unit wages. All of the foregoing except the last item alone are detached from the basis of exposure employed in determining premiums and hence would be important, if not controlling, factors in rate-making under any system. The last factor by itself is capable of fairly exact actuarial measurement and adjustment. Therefore, the question of adequate rates seems largely detached from the particular basis of exposure which may be employed. Inadequacy may be due to inertia, political and economic resistance, lack of vision or certainty of data and a number of other considerations. It is fostered by the existence of considerable numbers of employers of low degree of responsibility to whom insurance cannot well be denied under the existing American system. It does not appear to be a condition inherent in the use of the payroll basis of exposure, nor connected with the same in a controlling or important manner.

Equitableness of the measurement of risk is most readily considered by examining possible alternatives, together with the payroll basis. Among these are (1) the average annual number of employees (per capita) (2) the man hour, (3) individual output in bulk, tonnage or value, (4) the nature and bulk or cost of construction projects and (5) various specialty measurements of restricted application, such as mileage of taxicabs and mileage or flying hours of aircraft. Several of these afford reasonable measurements of exposure to hazard but are quite detached from a proper correlation to the liability per unit of exposure due to the variation of the benefit schedule as governed by the earnings of the individual. Consequently, they have the defect of being approximated to an average condition of liability without the practical possibility of varying the average figure to fit the individual case. Where conditions are fairly uniform, this is no material objection. To illustrate: under most compensation acts practically all domestic servants receive less than the maximum benefit and in aircraft operation probably all employees would be uniformly entitled to the maximum. But these are special and unusual cases. Aside from the building construction trades, and

a few other special cases, practically all types of operations include employees, in widely varying proportions, who receive wages under the minimum provided by the act or in excess of an amount sufficient to produce the maximum benefit, in addition to the much larger number whose benefit lies between the minimum and the maximum. Any basis of exposure which does not recognize such varying liability for the individual employee tends to produce a very broad averaging of premiums and of losses and would either throw a much greater burden upon the individual rating plans where applicable or, in their absence or inapplicability, will diminish the equitable correlation between premiums and potential liability which results under the payroll system.

Dependability of the record is a matter of accuracy in recording the primary data and carrying the same into accessible and reasonably permanent centralized accounts which are susceptible to cross-check and verification by convenient reference to other recognized and standard sources of information. The payroll system employs a set of records which the employer generally and naturally keeps for his own information and which, in large part, he is required to maintain under various provisions of law. It is not necessary to establish under the insurance contract any new or special obligation for either primary or secondary records of business operations as a consideration of insurance coverage by any employer whose existing procedure meets the elementary requirements of modern business practice. This is important in avoiding the creation of additional and special requirements which might be expensive, annoying and incompletely fulfilled. Payroll expenditures are directly susceptible to cross-check in the books of account, bank checks, income tax and other more or less well-established sources.

Wage expenditures may be incorrect in total or in distribution and by accident or by design. Errors of accident are of no great concern. They usually reveal themselves. Errors of design are neither inherent in nor peculiar to the exhibit of monetary wages. If records of wages can be falsified when normal business requires and permits of existing possibilities of cross-checking, it is inconceivable that records of output or man hours of labor could not be similarly and much more readily falsified and made proof against reasonable detection.

Per capita exposures are not recorded as a primary measure but must be determined by some process of averaging which requires reference to other primary records, such as wages or man hours. While per capita measurement is now employed within certain very narrow limits, it appears to offer no satisfactory basis for general application. Measurement of production by output is an extremely variable matter which offers very little promise of useful application save for test checking purposes with the possibility of useful application directly in special and limited fields. In certain trades and industries the man hour basis is quite generally employed in the primary records, but is not carried into the books of account and does not appear to offer a ready means of proper identification and allocation for rating purposes, nor the possibility of cross-checking through other standard accounting requirements or practices. Such records in general are not permanent and in a great many situations do not apply uniformly to all the employees of a given employer. Executives, salesmen and technical or supervising employees will receive salaries independent of hours of labor and minimum wage laws. Union regulations and trade practices or codes also intervene and considerably interfere with the man hour as a direct measure of exposure and as a correlation to an approximate wage total of employees not on a salary basis. For piece-workers and others working under an incentive arrangement the employer has little or no interest in the hours of labor, and in many instances may have no record of time expended.

Stability. In the nature of things almost any substitute for the payroll basis, being a form of physical measurement, would be more proof against unsettlement of the attendant schedule of rates than a system keyed directly and exclusively to the aggregate volume of remuneration and, therefore, largely a function of the unit rate of pay. If it were expected that wages must continue subject to kaleidoscopic change, there might be sufficient advantage in the substitute schemes to out-weight their disadvantages in order to secure such comparative or improved stability of premium rates. But it has been noted that inadequacy of rates is not primarily an actuarial problem, but may reasonably be generalized as buyer-psychology. And it is scarcely to be assumed that economic conditions will indefinitely continue sub-

ject to influences of such rapid and unpredictable variation. As noted heretofore, substitute bases present no greater advantage or defense against variability as to any of the numerous factors influencing rate of premium save that due to wage level alone.

Practicability of Application. Under the payroll basis we find certain provisions of policy contract, numerous rules of underwriting and, in some of the states, provisions of statute which are constructed and applied exclusively to the payroll basis as developed from the beginnings of workmen's compensation and its antecedent, employer's liability insurance. They contemplate and are satisfied by the employer's ordinary and natural methods and books of account. Intelligently and honestly applied these sources and practices have yielded adequate and equitable results. To depart from this system would involve changes of most fundamental and far-reaching character. If practicable and desirable upon other considerations they would, at best, any or all of them, require extensive reconstruction of underwriting procedure, contract forms and some revision of law. They would require complete alteration of existing statistical data and introduce a long period of experimentation and uncertainty. They would require important alteration in the practices and records of innumerable industries and employers and, in many instances, entail the necessity of establishing new and different kinds of records of no value or interest to the majority of employers except to satisfy the demand of his insurance carrier and as a consideration of the insurance contract. Such added trouble and expense must inevitably meet with begrudging compliance and at best result in a long period of patient education. That it is expedient or wise to force such added burden upon business in the sole interest of the insurance carrier is a matter of grave doubt. There is no inherent reason why the results of such substitutes, universally applied, should be more adequate, equitable or satisfactory from any standpoint than those equally attainable under the payroll system. With a possible exception of the man hour, no single alternative basis has appeared which could possibly be considered as a workable substitute of universal application. Per capita measurement inevitably requires estimation of the average exposure. Volumetric and cost studies appear to have possibilities of useful application in such fields as construction work. Measurement

of output, which has been considered in relation to manufacturing, appears to be too highly variable from line to line and from plant to plant in various localities and dependent upon such a wide range and number of variables as to miss practically all of the criteria for a satisfactory rate base.

In summary of all such studies the Committee has unanimously concluded it best that the payroll basis of exposure be continued. It is as free from inherent objection or difficulty and as susceptible to accurate and convenient determination as any substitute which has been proposed. It employs the universal standards and language of commerce. It imposes no added or objectionable requirements which would provoke antagonism or non-cooperation on the part of the assured. It permits the introduction of supplementary checking measures which may be valuable in special instances but retains the aspects and advantages of a unified and universal process. It is as direct, expedient and economic a system of administration as can now be devised from the standpoint and advantage of all parties to the insurance contract.

In so holding the Committee does not overlook the existence of weaknesses in the payroll system nor the possibility of improving the same. The Committee's own studies and evidence furnished by the auditors have revealed weaknesses in classification structure which make for lack of understanding and difficulties of application in effecting a proper settlement of premium. It is felt that parts of the manual in recent use have failed to take full cognizance of changes in the organization and conduct of the industries. To illustrate generally: the Committee points to numerous changes in the 1934 basic manual which have included the vehicular exposure with the governing classification and also, in some cases, the sales forces, which heretofore required division of payroll but which presently exhibit the aspect of an integral part of the organization of business and a definite feature of the hazard represented by the governing classification. The Committee has not attempted a critical study of the entire manual but believes that changes of this sort have been most timely and necessary and that further and continuing studies along the same line should be made.

It is quite obvious that the inherent instability of wage basis—premium rates could be diminished if the individual wage were taken within those minimum and maximum limits which control

the benefit payable. In pure theory it would be desirable to do so. To introduce such a system generally would be most difficult and probably so complicate the procedure and increase the expense as to nullify every advantage which might be attained. In many instances an audit of the individual employee wage would be required and the advantage of cross-checks would be lost. In addition, a set of special and different criteria and regulations would be required for almost, if not quite, every separate compensation law. Such a practice is, therefore, not advocated but it is believed that special cases exist beyond the small number which the rate manual now recognizes where a departure from the general payroll basis will be found desirable either as a substitute or as a supplement to or modification of the payroll measure. This subject is commended to the continued attention of the rating organizations.

It has seemed to the Committee that a community of interest exists between the companies, the rating organizations and the various industries in the matter of premium charges and rating conditions which should be recognized and cultivated to a much greater extent than has been the case. Today practically every industry of any consequence fits into some central organization which has an intimate and expert knowledge of internal conditions and is capable of negotiating and speaking with authority for the trade or industry involved. Instances undoubtedly exist where practices which occasion difficulty to the carrier are also of concern to the organization and the industry itself. There would seem to be every reason why a free interchange of ideas and a measure of cooperation would be of advantage to all interested parties. Through such cooperation a much better understanding should be brought about and valuable assistance secured in providing for a rational and practical approach to the equitable measurement of risk in such trades or businesses for which the payroll yard-stick may not be directly or exclusively the best criterion. Again experience proves the point in the discussions with the aircraft operation industry, which have led to the development of special rating rules and standards which appear eminently preferable to the wage measure alone and which methods, peculiarly adapted to aircraft operation, are probably of no value or possible application to any other business.

In the State of New York the Committee has found an excellent

example of special methods applied to conditions for which payroll-rating has been found inadequate, inequitable or not capable of application in a practical and satisfactory manner. The specific points of difficulty may not exist elsewhere or may require a different sort of treatment to attain the same objective. The point is made that agreement upon the payroll basis does not preclude the desirability and the need for supplementary or alternative methods where conditions permit or require. The operation of aircraft has been cited as a case in point. To this we may add the operation of taxicabs, window cleaning and the demolition of structures. Whereas a formula applied to structural quantities, in the latter case, directly develops the premium charge the same principles might be advantageously applied to erection work either with the same object or as a check upon the results of payroll-rating. Formula treatment has been tested to some extent in other directions and extension of such efforts is commended. No specific subject for especial study is here proposed but the desirability and necessity for special rating practices in other fields must unquestionably exist.

Respectfully submitted,

COMMITTEE ON BASES OF EXPOSURE
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OBITUARY**ROBERT J. SULLIVAN**

1879-1934

Robert J. Sullivan, a charter member of this Society, died suddenly on July 19th from injuries received when he was struck by an automobile while crossing a street in New York City.


Mr. Sullivan was born in Hartford on October 20, 1879, and was educated in the grammar and high schools of that city. He entered the employ of The Travelers Insurance Company as a clerk in the accident actuarial department on July 20, 1899, almost thirty-five years to a day, prior to his death. He was appointed Secretary of the liability department in 1912. In 1922 while continuing to serve as Secretary of The Travelers he was elected a Vice-President of The Travelers Indemnity Company, and in 1927 he was promoted to a Vice-Presidency of The Travelers Insurance Company, both of which offices he held at the time of his death.

In addition to his company responsibilities, Mr. Sullivan assumed an important place in the deliberations of the many organizations that dealt with the problems arising from the development of workmen's compensation, automobile, and other lines of casualty insurance. He was active in the promotion and organization of the National Bureau of Casualty and Surety Underwriters and of the National Council on Compensation Insurance. He was elected a director of the American Standards Association in 1929 because of his intense interest in safety and conservation work and in the prevention of accidents of the type of which he himself fell a victim. He was recognized as a national authority on casualty insurance. He studiously followed the development of the actuarial science of ratemaking and contributed occasionally to the oral discussions held by this Society.

Mr. Sullivan's accomplishments were characterized by his tireless energy and enthusiasm which were nicely tempered with a wealth of technical information and underwriting wisdom. Possessed of a keen perception, an unusual ability to organize and direct, and a devotion to sound principles, he embodied all of the

qualities necessary to make him an outstanding figure among the leaders of casualty insurance. No less admirable were his fine human qualities, particularly his sympathetic personal interest, which endeared him to all who were associated with him.

His untimely death constitutes a distinct loss not only to his friends and the organizations he was actively assisting but to the casualty business as a whole. The example of Mr. Sullivan's successful career and the memory of his upright character will long serve as an inspiration to those who continue in the work to which he devoted his lifetime.



OBITUARY**WILLIAM ARTHUR BUDLONG**

1872-1934

William Arthur Budlong, a charter member of this Society, died at his home in Sauquoit, New York, on June 4th, death being due to heart disease.

Mr. Budlong was born November 27, 1872, in the town of Steuben, New York. He graduated from Holland Patent High School, then entered and graduated from Fairfield Seminary, Fairfield, New York. After a short period of service as stenographer in 1891 he entered the employ of the Commercial Travelers Mutual Accident Association, Utica, New York. His first position was private secretary. Ultimately he became Claim Superintendent, which position he held until his death. He was also past Secretary and past Vice-President of the International Claims Association.

For the past four years he had lived at his country home in Sauquoit, New York. He took great pride in the growing of roses and other flowers. Up to the date of his death, he had, apparently been in good health, and had attended business every day.

While Mr. Budlong was not an active participant in the work of the Society, he was a regular attendant at its meetings and took a great interest in its work. By those members who knew him well he will be missed as one who represented the elder generation of the accident and health fraternity.

CASUALTY ACTUARIAL SOCIETY

NOVEMBER 22, 1934

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ABSTRACT FROM THE MINUTES
OF THE TWENTIETH ANNIVERSARY CELEBRATION
AND ANNUAL MEETING

NOVEMBER 22 AND 23, 1934

The twentieth anniversary celebration and annual meeting of the Casualty Actuarial Society was held at the Hotel New Yorker, New York, on Thursday and Friday, November 22 and 23, 1934.

President Dorweiler called the meeting to order at 10:20 A. M. The roll was called, showing the following seventy-three Fellows and twenty-seven Associates present:

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COOK	LAWRENCE	SKELDING
CRANE	LESLIE	SKILLINGS
DAVIS, E. M.	LINDER	SMITH, C. G.
DEKAY	LUNT	St. JOHN
DORWEILER	MAGOUN	TARBELL
DUNLAP	MARSHALL	VALERIUS
ELSTON	MASTERSON	VAN TUYL
FACKLER	MATTHEWS	WAITE, A. W.
FLYNN	MAYCRINK	
FONDILLER	McMANUS	

ASSOCIATES

ACKER	HARRIS	OBERHAUS
ANKERS	HIPP	PENNOCK
BARRON	JONES, H. L.	PIPER, J. W.
BITTEL	JONES, L. D.	ROBBINS
BUFFLER	MACKEEN	SMITH, A. G.
FURNIVALL	MAGRATH	WARREN, C. S.
GATELY	McCONNELL	WILLIAMS
GIBSON	MONTGOMERY, J. C.	WOOD, M. J.
GILDEA	NEWHALL	WOODWARD

Mr. Dorweiler read his presidential address.

The minutes of the meeting held May 18, 1934 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 Sixth Edition of the Recommendations for Study had been printed as a separate pamphlet for candidates and is also included in this number of the *Proceedings*. In respect of the 1934 examinations these resulted as follows:

The following Associates had passed the necessary examinations and had been admitted as Fellows:

E. T. BERKELEY	E. A. COOK	R. O. HOOKER
W. J. CONSTABLE	G. V. FULLER	

The following candidates had passed the necessary examinations and had been enrolled as Associates:

E. L. BOMSE	J. J. GATELY	H. V. WILLIAMS, JR.
W. T. EPPINK	H. M. McCONNELL, JR.	B. H. WOODWARD
G. W. FITZHUGH	W. H. THOMPSON	

The following candidates had been successful in completing the examinations for Associate but have not yet been enrolled by reason of the terms of Examination Rule 4:

A. E. CLEARY	F. KNOWLES	E. KARDONSKY
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Diplomas were then presented by the President to E. T. Berkeley, W. I. Constable, E. A. Cook, G. F. Fuller and R. O.

Hooker, who had been admitted as Fellows under the 1934 examinations.

The President announced the deaths since the last meeting of two Fellows, William A. Budlong and Robert J. Sullivan and the memorial notices appearing in this Number were thereupon read. The names of all the deceased members, since the organization of the Society in 1914, were read as a mark of respect to their memory.

The reports of the Secretary-Treasurer and of the Librarian were read and accepted. The annual report of finances follows:

CASUALTY ACTUARIAL SOCIETY

ANNUAL REPORT OF FINANCES

Cash Receipts and Disbursements from October 1, 1933, to
September 30, 1934

INCOME

On deposit on October 1, 1933, in Marine Midland Trust Company		\$1,006.34
Members' Dues.....	\$2,680.00	
Sale of Proceedings.....	1,257.75	
Examination Fees.....	422.00	
Examination Data.....	24.00	
Luncheons.....	222.00	
Interest and Miscellaneous.....	56.28	
Michelbacher Fund.....	59.75	
Fondiller Prize.....	100.00	4,821.78
Total.....		\$5,828.12

DISBURSEMENTS

Printing and Stationery.....		\$3,711.57
Postage, Express, etc.....		177.08
Stenographic Services.....		360.00
Library Fund.....		6.84
Luncheons.....		271.30
Examination Expense.....		17.90
Miscellaneous.....		86.52
Total.....		\$4,631.21
On deposit on September 30, 1934, in Marine Midland Trust Company.....		1,196.91
Total.....		\$5,828.12

Income.....	\$4,821.78
Disbursements.....	4,631.21
Excess of Income over Disbursements.....	190.57
1933 Bank Balance.....	1,006.34
1934 Bank Balance—.....	\$1,196.91

ASSETS

Cash in Bank.....	\$1,196.91
Bonds.....	1,000.00
Total.....	\$2,196.91

The publication of the Second Index to the *Proceedings* was announced by the President. It had been edited by James S. Elston, to whom the Society gave a vote of thanks.

The Auditing Committee (C. G. Smith, Chairman), reported that the books of the Secretary-Treasurer had been audited and his accounts verified.

The Examination Committee (A. N. Matthews, Chairman), submitted a report of which the following is a summary:

1934 EXAMINATIONS—SUCCESSFUL CANDIDATES

The following is a list of those who passed the examinations held by the Society on May 16 and 17, 1934:

ASSOCIATESHIP EXAMINATIONS

- | | | |
|------------------|--------------------|----------------------|
| <i>PART I:</i> | CODIE D. BELL | ELSIE KARDONSKY |
| | E. L. BOMSE | FREDERICK KNOWLES |
| | ARTHUR E. CLEARY | WILLIAM M. LLOYD |
| | RICHARD L. GLAZIER | M. H. McCONNELL, JR. |
| | DANTE GOZZI | S. TYLER NELSON |
| | HAROLD M. JONES | ROY ROSENQUIST |
| <i>PART II:</i> | CODIE D. BELL | HAROLD M. JONES |
| | E. L. BOMSE | ELSIE KARDONSKY |
| | ARTHUR E. CLEARY | FREDERICK KNOWLES |
| | MARY E. COLEMAN | M. H. McCONNELL, JR. |
| | JOHN F. EMERSON | S. TYLER NELSON |
| | FRANCES C. FISBECK | L. EDWARD NOWAK |
| | CHARLES A. FURSA | E. D. SAYER |
| | HAROLD E. GARRETT | J. V. WALSH |
| | PAUL-EMILE GIROUX | |
| <i>PART III:</i> | E. L. BOMSE | FREDERICK KNOWLES |
| | ARTHUR E. CLEARY | M. H. McCONNELL, JR. |
| | ABRAHAM J. COHEN | J. A. MILLS |
| | ARTHUR C. DANIELS | GEORGE I. SHAPIRO |
| | JOHN J. GATELY | HARRY V. WILLIAMS |
| | RICHARD L. GLAZIER | B. H. WOODWARD |
| | ELSIE KARDONSKY | |
| <i>PART IV:</i> | E. L. BOMSE | FREDERICK KNOWLES |
| | ARTHUR E. CLEARY | M. H. McCONNELL, JR. |
| | JOHN J. GATELY | HARRY V. WILLIAMS |
| | RICHARD L. GLAZIER | B. H. WOODWARD |
| | ELSIE KARDONSKY | |

FELLOWSHIP EXAMINATIONS

<i>PART I:</i>	JAMES BARRON, JR. ERNEST T. BERKELEY W. J. CONSTABLE J. B. CRIMMINS	WALTER T. EPPINK GILBERT W. FITZHUGH RUSSELL O. HOOKER WALTER H. THOMPSON
<i>PART II:</i>	JAMES BARRON, JR. ERNEST T. BERKELEY W. J. CONSTABLE J. B. CRIMMINS	WALTER T. EPPINK GILBERT W. FITZHUGH RUSSELL O. HOOKER WALTER H. THOMPSON
<i>PART III:</i>	ERNEST T. BERKELEY W. J. CONSTABLE E. A. COOK	GARDNER V. FULLER RUSSELL O. HOOKER
<i>PART IV:</i>	ERNEST T. BERKELEY W. J. CONSTABLE E. A. COOK	GARDNER V. FULLER RUSSELL O. HOOKER

The report of the Committee on Bases of Exposure for Compensation Insurance (A. R. Lawrence, Chairman) was read. In accordance with the Council's recommendation it was accepted, the report was ordered printed in the *Proceedings*, and the Committee was discharged with thanks.

The Council's election of Clarence W. Hobbs, Editor and William Breiby, Librarian, subject to confirmation by the Society, was announced.

The annual elections were then held and the following officers and members of the Council were declared elected:

<i>President</i>	WINFIELD W. GREENE
<i>Vice-President</i>	RALPH H. BLANCHARD
<i>Vice-President</i>	CHARLES J. HAUGH
<i>Secretary-Treasurer</i>	RICHARD FONDILLER
<i>Editor</i>	CLARENCE W. HOBBS
<i>Librarian</i>	WILLIAM BREIBY

Members of Council (terms expire in 1937):

ARTHUR N. MATTHEWS	CHARLES G. SMITH
CLARENCE A. KULP	

The Committee on Papers (Leon S. Senior, Chairman) stated that four papers had been submitted in competition for the Richard Fondiller Prize, all had been approved for inclusion in

the *Proceedings*, and that the title of the best paper was "Product Public Liability Insurance". The Editor (Clarence W. Hobbs) then announced the name of the author. The President thereupon presented the prize of One Hundred Dollars to James M. Cahill.

The presentation of the new papers printed in this Number was begun.

Recess was taken for lunch at the Hotel until 2:15 P. M.

Dr. I. M. Rubinow was unable to attend the Twentieth Anniversary Celebration and the message which he sent was read and appears in this Number. The Society sent Dr. Rubinow a telegram expressing hearty appreciation of his letter.

To commemorate the organization of the Society in 1914, addresses were made by G. F. Michelbacher, T. O. Carlson and Dr. Jules I. Bogen, which appear in this Number.

The meeting adjourned at 5 P. M.

In the evening the Twentieth Anniversary Dinner was held at the Hotel New Yorker. A photograph of those present is included in this Number. This was followed by several sketches and discourses of a humorous and satirical nature, which were given by members.

On November 23rd the meeting was called to order at 10:10 A. M. by the President.

The presentation of new papers was concluded.

The papers read at the last meeting of the Society were discussed.

The following subjects for which speakers had been selected, were informally discussed:

1. Recent and probable future trends of experience in the following lines:
 - (a) Automobile personal injury and property damage liability.
 - (b) Personal accident and health.
 - (c) Fidelity and surety.
2. The rising cost of medical in workmen's compensation and how to curb it.

Upon motion, the meeting adjourned at 1:00 P. M.

PROCEEDINGS

MAY 24, 1935

THE CHIEF TROUBLE WITH WORKMEN'S
COMPENSATION INSURANCE

PRESIDENTIAL ADDRESS BY WINFIELD W. GREENE

As a nation we are confronted with the adoption of a comprehensive social insurance system at a moment when it is particularly evident that we are not in agreement as to how to handle workmen's compensation, the one form of social insurance which we have had with us for more than two decades!

The legislative sessions of last winter, happily now over for most states, elicited more than the usual quota of thrills in that perennial melodrama wherein Private Compensation Insurance has thus far never failed to escape miraculously from her relentless enemy, Monopolistic State Insurance. In the 1935 version of the play as presented in New York, our heroine was slated to die,—in fact, to all appearances, was dead,—but was resuscitated with the aid of the Fire Department in conformity to a last minute change in script which fortunately got to the Massachusetts road company just as the curtain was about to go up on the last act of the show!

The swiftness of recent political changes makes it plain that there is real danger that the field of compensation insurance will suddenly be closed to private carriers not merely in one or two states, but in all, or practically all, of them. Now there are those even among casualty men who refuse to view this situation with alarm. "The compensation business", they say, "will never be anything but a drain on us. Let the state take it over, and good riddance! Then we can turn our attention to our proper field."

I trust I may be pardoned if I ask these altruistic citizens a few questions.

Is compensation really any more affected with the public interest than is liability for injuries inflicted by busses and taxicabs? If the state were to handle any part of automobile liability, why shouldn't it take it all over? How about injuries to the public inflicted by a contractor building a subway or a highway at the specific behest of a public body? In short, if the present line fence between your "proper field" and that of the state is to be moved at all, just how far back would you move it; and are you sure that your neighbors (on the other side of the fence) would agree that you had moved it far enough?

Let us not be deluded. If compensation goes "Monopolistic State Fund", there will be scant cause to hope that the movement will stop there. More likely it will embrace automobile liability insurance in a considerable number of states. Though public agitation is hushed temporarily, the reality is that between a quarter and a half of the entire casualty business is in imminent jeopardy.

If we believe in private casualty insurance, and in spite of its shortcomings, I know of no reason why it is not infinitely to be preferred to state monopoly, then the only logical attitude for us at this time is a militant one. But to defend our domain we must be shrewd as well as bold. Martyrs may eventually be canonized, but during their lifetimes they are seldom popular. Therefore, it behooves us, I think, to impute somewhat less blame to legislators, industrial commissions, evil competitors, etc., than we have been prone to do in the past; to switch from the black to the white keys, in other words, and assure the world once and for all that although there are many difficulties inherent in this compensation business the casualty companies of the United States are perfectly capable of surmounting them.

This will be an excellent start, but I am sure it will be no more than that unless it is accompanied by an honest and unflinching effort to adapt private compensation insurance more closely to the needs of the public. It is with the problems incidental to this latter task that this paper is mainly concerned.

Before I proceed, just a word of explanation. I shall address myself mainly to the difficulties of the stock companies, but, I assure you, in no partisan spirit; unless it is partisan to oppose state monopoly. The future of all forms of private casualty insurance is threatened. The bills which so narrowly failed of adoption in recent legislative sessions were directed against stock,

mutual, and reciprocal alike. The destinies of the participating carriers are linked with those of the stock companies, and each group, regardless of preference or prejudice, is in vital need of the cooperation of the other.

I have set myself the task of revealing to you "the chief trouble with workmen's compensation insurance". Two years ago, before this Society, I asked whether the chief trouble was "the rate-making plan", and answered my own question, "No".

By "rate-making plan" I meant the plan for making manual rates; and subject to this definition I am well convinced that I gave you the correct answer. Indeed I hope to prove this to you in a few moments. This implies that in my opinion the adoption of the new rate level plan of the National Council on Compensation Insurance has not changed the situation materially.

The statutes recently adopted in New York and other states whereunder the companies collectively guarantee the payment of compensation benefits in the event of the insolvency of one of their number are constructive in purpose, and I am confident that they will prove equally so in practice; but they do not correct the most important of the fundamental evils.

The chief trouble with compensation insurance lies in the operating plan of the stock carriers. This plan has broken down badly not only because it carries an acquisition cost which is higher than is economically justified, at least for fair-sized risks, but also,—and this is even more important,—it provides no way whereby a company whose aggregate loss and expense costs are less than the average may share the resultant saving with its assured, either through rate reduction, or by way of a dividend.

This ill-omened plan dangles a rich and speedy reward before the producer, but at the same time it deprives him of the salesman's mightiest weapon; for he cannot lawfully vary his price, and many of the mutuals render excellent service at a net price lower than his. Unable to interest good risks, the producer is therefore forced to press doubtful business upon his carrier. The company, having little to bargain with except its commission, feels itself hardly in position to be too "tight" in its underwriting, and falls back upon the "quota" plan; and the producer, regarding his stock company market as but a temporary one, is tempted to fill his quota with risks which he has tried unsuccessfully to place with the mutuals.

Now, if anyone believes in the present plan and feels that the troubles of the stock companies can be overcome by merely increasing the rate level, I invite his attention to what happened to the compensation business in the State of New York during the six years beginning with 1929 and ending with last year. I refer to New York because the figures for that state are particularly available, but fortunately there are several reasons why it is the best choice possible for this purpose. It is the most important state in point of population and premium volume. It is a progressive, but not a radical, state. It is the domicile of many substantial companies, both stock and mutual. It is a "regulated" state, i.e. in New York not only are manual rates subject to approval by state authority, but the application of such rates and of the merit rating plans is closely checked by a strong Rating Board which is supervised by the Superintendent of Insurance. For all these reasons, the figures for New York are both dependable and significant.

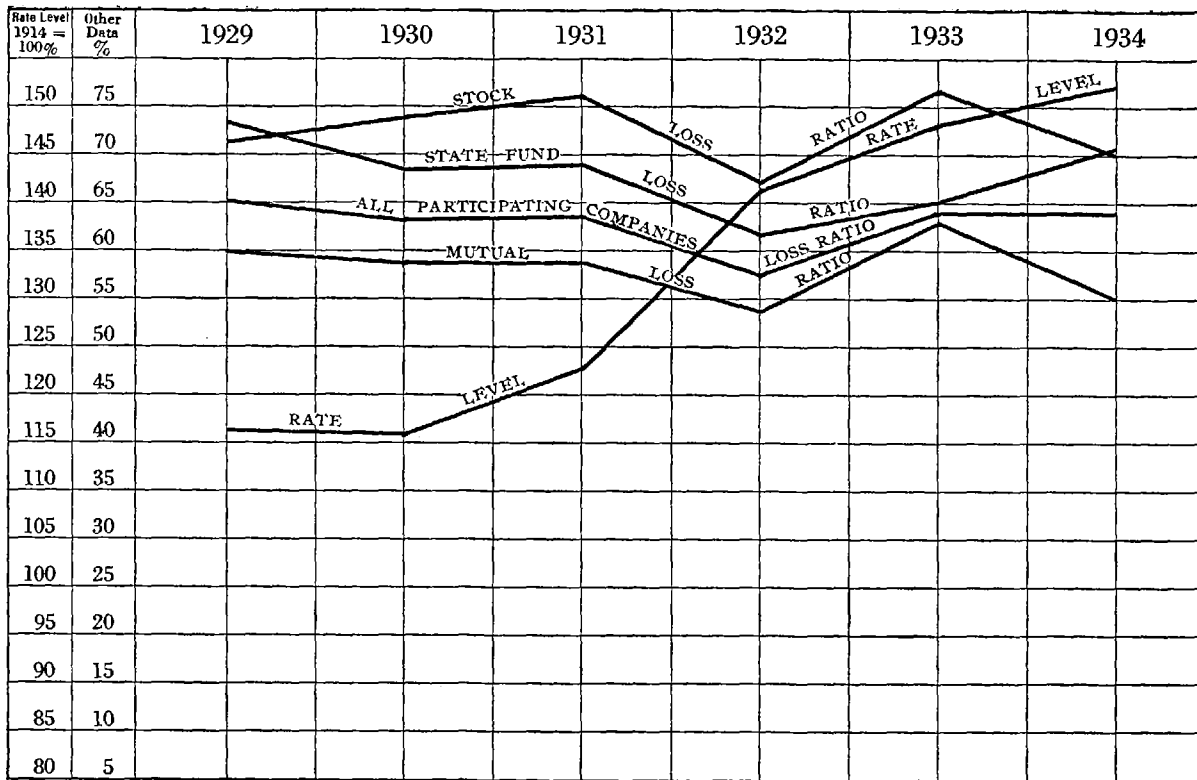
In order to present these figures as clearly as possible, I have had two charts prepared. That captioned "A" shows the loss ratio for each of the six calendar years for stock companies, mutuals, all participating carriers and for the State Fund. The chart captioned "B" shows the proportion of total volume in each of the years just mentioned which was carried by the same entities. On each of these charts appears a rapidly ascending line which represents the manual rate level.

During the six years mentioned there occurred a sharp increase in rate level. The mean rate level for premiums earned in calendar year 1929 was about 17% above the level of 1914. The level last year was about 52% above 1914. (This year it will be still higher). Certainly, we cannot count on increasing rates so rapidly again, so that the period under review probably presents an all-time record for a rapidly rising rate level. Just what did these increases accomplish for the stock companies?

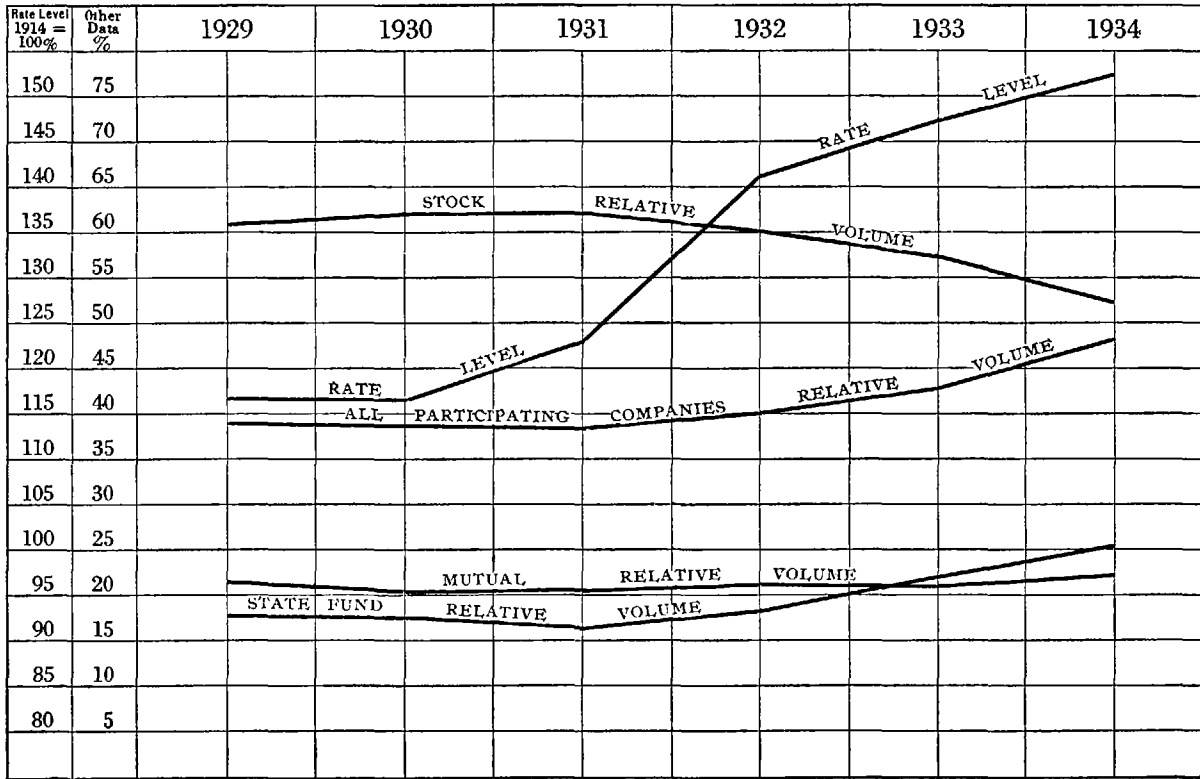
Little, if anything, I think, as respects their position relative to the field.

If we divide the six-year period into thirds, we find the stock company loss ratio in the "low 70's" for each successive two-year period. Evidently no improvement there. The Mutuals' loss ratio for separate calendar years runs fairly parallel to that of the Stocks, but on a level between 12 and 17 points lower.

A.—LOSS RATIOS



B.—RELATIVE VOLUME



As for their proportion of total compensation business in the state, the stock companies dropped from 61.0% to 52.3%; while, at the same time, the Mutuals increased their share slightly, i.e., from 21.4% to 22.6%.

The results for the period might be summarized as follows:

1. At the outset, the stock companies' loss ratio was higher than their underwriting income could absorb in view of their acquisition and other expense costs. Heavy rate increases kept this loss ratio from any material rise, but did not reduce it to the "permissible" point. Loss in volume, both absolute and relative, aggravated the problem of controlling the expense ratio.
2. The Mutuals, on the other hand, started the period, and likewise ended it, with a comfortable loss ratio. This means that, in view of their low total expense ratio, mainly due to low acquisition cost, they made a large underwriting profit, and, as a group, were able to disburse substantial dividends to policyholders. They not only maintained their relative volume; their percentage of the total volume for the state has lately begun to pick up, whereas that of the stock companies has dropped rather sharply for the past two years.
3. Even had rates been adequate at all times the stock companies still would have lost money consistently throughout the period. If adequate rates are those that will produce a loss ratio of 57.5% for the entire business of the state (this implies a contingency loading of 2.5%, and is, you will agree, a sufficiently rigorous definition), the stock company loss ratio would still have been over 60% for each year but the first. In other words, in all but the first year they would have used up the contingency loading, and have impaired their expense allowance, if the latter is 40%. Actually the expense ratio of these carriers averaged 44.7% countrywide, so that upon the distribution of volume which obtained, the stock companies after the first year would have had an underwriting loss of 4.7% plus. However, if it had been possible to obtain the higher rates under discussion, it is likely that the exodus of the better business to the haven of participating insurance would have been so accelerated as to increase both the loss ratio and the expense ratio of the stock carriers materially, so that the underwriting loss would have been considerably greater than the figure just named.

Adequate rates might have mitigated the situation. Certainly they would not have cured it, and quite probably they would

have forced the stock companies into a weaker position than their present one, as far as prospective results are concerned.

Just what, then, should be done to preserve compensation insurance for the private carriers? To my mind there is no mystery about that; but since time is of the essence, and nothing by way of fundamental reform is in active process as far as this observer can determine, I shall take the liberty of restating what I consider the proper program would be.

1. The stock companies should adopt the participating plan. By this I mean a plan whereunder each year the compensation policyholders of a given company would, as a group and irrespective of state lines, have returned to them as a dividend as great a percentage of the earned premiums as the company management can return after adequate provision for all liabilities and for reasonable profits to shareholders. This type of participating plan is analogous to that followed by the mutual companies. It is not to be confused with the rating plan as applied to the individual risk nor with any plan which has to do with the combined results for all companies.
2. Acquisition cost should be drastically reduced. The reduction should not be uniform for risks of all sizes, but rather should be graduated according to size of risk as measured in terms of premium; and this graduation should be reflected approximately in the premium collected from the assured.

These are the two most essential reforms. I believe their adoption is altogether imperative. The following are some of the advantages which I am sure would accrue from them:

1. The adoption of the participating plan would harmonize the interests of company and producer in respect of risk selection; for the producer's chief competitive weapon would be his company's dividend rate, which is dependent on its loss ratio.
2. With all carriers upon the participating plan, and with much less than the present disparity between them as to total costs there would be no particular reason for controversy as to rate level, nor any justification on the part of state authority for refusal to approve rates which are abundantly adequate.
3. With a safety margin in the rates for all well-managed carriers, manual rate changes would be less frequent and

frenzied. This would not only promote economy and good will; it would tremendously facilitate the weathering of economic disturbances.

I am persuaded that the changes just proposed are a prerequisite to any permanent peace or constructive development in the compensation business. There are two other problems which, though not so basic, are sufficiently outstanding to require mention.

It is obvious that in any given territory too many offices are attempting to engage in workmen's compensation insurance. Even with reduced acquisition cost there is no hope for a profit in the business for any company which is unable to command a fair volume in each territory it enters.

The remedy here is necessarily the withdrawal of some carriers unless companies find it feasible to an increasing degree to pool their facilities in such matters as inspections, auditing and claims work.

Although in theory the experience rating plan may attach too high credibility to certain features of the experience of the individual risk, there is still a question whether practically the good risks are adequately rewarded or the bad risks sufficiently penalized. We may be giving more weight than we should to the occurrence of "serious" cases and to the actual cost of the non-serious cases; and, on the other hand, we may be giving too slight heed to the frequency of compensable accidents. This is a highly technical problem and one over which stout controversy has been waged. I do not say that a more equitable solution than the present one can be found, but undeniably such an achievement would be of constructive value if accomplished. Admittedly any proposed solution will not be worthwhile unless it is reasonably free from competitive manipulation.

What I advocate is not "a scheme for putting the mutuals out of business", as someone, I trust jokingly, labelled it a couple of years ago. After what so nearly happened last winter, this point should not require argument. "A house divided against itself cannot stand"; and if private casualty insurance is to survive, I am sure that it will do so as the result of a greater degree of harmony in method and in general objective than hitherto has obtained as between its component parts.

Neither am I desirous of depriving the producer of his just remuneration. Rather, I feel that any system of insurance to endure must adequately recognize him. However, it is my belief that commission scales in the compensation business have been higher than is warranted by the compulsory nature of the coverage. Many individual producers recognize that a moderate rate of commission on a fair volume of business is preferable to a higher rate of commission upon a small and dwindling volume; and some of them are practising this theory privately whether or not they profess it publicly.

It is probable that the selective process now operating against the stock carriers will be considerably slowed down if we enter a period of unusual prosperity. It is not inconceivable that we are shortly to enter such a period. In such event, it may turn out that with no fundamental reform at all the compensation business of the stock companies will show black figures for the time being. It would be a calamity of the first order if superficially favorable results are invoked as a preventive of permanently constructive remedies. I urge, therefore, that we prepare for the next deluge while the memory of the last is still vivid!

HISTORY AND PRESENT STATUS OF NONCANCELLABLE ACCIDENT AND HEALTH INSURANCE

BY

JOHN H. MILLER.

The subject of noncancellable accident and health insurance has received no more than brief reference in any paper published in the *Proceedings* since 1921. At that time it was a very live topic, and was discussed at length in several papers.* Since many developments have occurred in this line during the past fourteen years, it seems appropriate at this time to present a résumé of its history to the Society.

BRITISH EXPERIENCE

According to available information, the first policy of noncancellable accident and health insurance was written by the Century Insurance Company of Edinburgh in 1885. A recent discussion of disability insurance issued by this company appears in a paper by Mr. W. A. Robertson, printed in the *Transactions* of the Faculty of Actuaries, Volume XIV.

Other British companies have since commenced writing this type of coverage. The policies sold in Great Britain differ from the usual life income coverage issued in this country in that indemnity payments cease at the terminating age of 55, 60 or 65, regardless of the age at inception of disability. This is a much sounder form of coverage than the life indemnity form, since it is based on the principle that disability insurance represents indemnity for loss of earnings. Where income payments are available beyond the normal span of earning capacity, the coverage is likely to become a superannuation benefit rather than an indemnity for loss of time due to disability.

* Premiums and Reserves for Noncancellable Accident and Health Insurance, E. E. Cammack, *Proceedings*, VII.

Noncancellable Accident and Health Underwriting Problems, J. M. Laird, *Proceedings*, VII.

The types of policies offered by one British company include :

- (a) Immediate coverage, subject to a seven-day retroactive waiting period and a 50% reduction in indemnities after the first six months of disability. The latter provision, common among British friendly societies, has proved to be an effective deterrent to malingering.
- (b) Level protection, with a three-month or six-month waiting period.
- (c) The above forms are also issued with a provision for return of all premiums at the terminating age or prior death. After the policy has been in force for five years the insured is entitled to a cash surrender value or paid up endowment insurance, at his option.

Premiums charged for Form (b) are shown below in comparison with net premiums based on the 150% Modification of the Class III Disability Table and 3% interest, the basis being used currently by some companies in this country for waiver of premium disability benefits in connection with life insurance. The more stringent 165% Modification is used for income benefits.

TABLE I
ANNUAL PREMIUMS PER \$10 MONTHLY INDEMNITY
Benefits Terminating at Age 60

Age	Three Month Waiting Period		Six Month Waiting Period	
	Gross Premiums	Net Premiums 150% Modification of Class III	Gross Premiums	Net Premiums 150% Modification of Class III
20	\$1.85	\$2.35	\$1.38	\$2.13
30	2.61	2.74	2.01	2.49
40	3.84	3.20	3.03	2.87
50	6.01	3.39	4.85	2.92

It is apparent that the expected sickness rates on which these gross premiums are based are considerably lower at the younger ages, and perhaps higher at the older ages than have been experienced in this country.

The experience of the British companies with these policies appears to have been satisfactory. This is doubtless due in part to careful and strict underwriting, to the elimination of benefits

at the older ages, and to the use of the average earnings pro-rating clause, but the key to their success may lie in the following statement (probably incomprehensible to most insurance men in this country) quoted from Mr. Robertson's paper cited above.

"The Policyholder must have confidence in the Company with which he elects to place his insurance, just as the Company must have confidence in its insured. In this regard I might say that although the Office with which I am connected has been doing Continuous Disability business for forty-five years, no difficulty or dispute has ever arisen which required to be taken to the Courts. Moreover, the provision for arbitration usually contained in our Policy has never been resorted to by any Assured. *The practical significance of this seems to be that a person who on account of some illness or accident is unable to follow his own profession or occupation, but who nevertheless is in good health, does not expect to receive an annuity if he should be unwilling to take up an outside occupation.*"

ORIGIN OF NONCANCELLABLE ACCIDENT AND HEALTH INSURANCE IN THIS COUNTRY

The first noncancellable, guaranteed renewable, accident and health policy was issued by the Massachusetts Accident Insurance Company in 1915. Other companies followed until by 1921 there were at least thirteen companies actively writing this line. The following table indicates the number of companies commencing and withdrawing from the noncancellable field since its inception. Four companies doing a reinsurance business only, two life companies which write only a noncancellable accidental death benefit, and several assessment companies are excluded. The type of coverage, to which reference will be made later, is also indicated.

TABLE II

Year	Number of Companies			Number Writing	
	Commencing	Withdrawing	Active at end of year	Life Indemnity Coverage	Aggregate Coverage
1915	1	—	1	1	—
1918	1	—	2	2	1
1919	3	—	5	5	1
1920	4	1	8	8	1
1921	5	—	13	12	2
1922	1	1	13	11	3
1923	2	—	15	13	3
1924	2	2	15	13	3
1925	—	2	13	11	3
1926	1	2	12	10	4
1927	4	—	16	11	8
1928	2	1	17	10	10
1929	—	—	17	11	11
1930	1	1	17	10	13
1931	2	1	18	8	14
1932	1	—	19	7	16
1933	—	1	18	7	16
1934	—	1	17	6	15
1935	—	—	17	4	15
(1st qtr.)					
Total	30	13			

TYPES OF COVERAGE

In order to draw any conclusions from the results of noncancelable accident and health insurance in this country, it is necessary to recognize the great variety of policies which bear the same general name. These various types can be classified roughly in two groups:

- (a) Life Indemnity Policies—those which provide a disability income so long as the insured remains disabled. There are many variations within this group, such as the age to which the policy is renewable, the waiting period, and the extra benefits or “frills.”
- (b) Aggregate Indemnity Policies—those which limit the benefits in the aggregate to a designated period of disability or amount of indemnity. The policy terminates when the aggregate limit has been paid on a single claim, or on all claims collectively. Policies in this group also vary considerably as to the length of the aggregate limit, the waiting period, and other provisions.

HISTORY AND DEVELOPMENT OF LIFE INDEMNITY POLICIES

The first ordinary noncancellable policy, written in 1915, was of the life indemnity type. All disability, both total and partial following total, was covered after a two-weeks' waiting period. The rates for this policy were graded by age at issue. In 1918 another company offered a life indemnity policy renewable to Age 60. During the next two years several companies offered similar policies renewable to Age 65, usually with a waiting period of two weeks, at the same rate for all ages. Other companies, influenced by their own experience on commercial policies and by the Manchester Unity Sickness rates, adopted or retained the graded rates. The resulting difference in rates between the two groups of companies introduced a serious obstacle to the establishment of a new, but popular form of insurance.

Following a report of the Underwriting Committee of the Bureau of Personal Accident and Health Underwriters in 1921, the flat rate was soon abandoned by all companies. The committee recommended graded rates according to age at issue, and also recommended the elimination of partial indemnity, elective indemnities, hospital and nurse benefits, and other extras and frills. A waiting period of not less than two weeks was suggested. Some policies had provided immediate coverage on all claims, others for accident claims only. Few companies adopted all of the committee's recommendations, but a tendency toward more restricted coverage was started.

The early policies contained very liberal terms. Total disability was defined, in the first policy, as disability from accidental injury or disease which necessarily, wholly and continuously disabled the insured from the performance of any and every kind of duty pertaining to *his* occupation. In 1921 most policies applied this definition to the first year of disability but required that the insured be unable to perform the duties of *any gainful* occupation, to be eligible for indemnity thereafter. These policies were generally prorating in the event the insured changed to a more hazardous occupation, but were otherwise free of prorating provisions. Only a few essential restrictions were contained in the contracts, many not even conditioning the company's liability on regular medical attendance of the insured.

Since 1921 the tendency has been toward restriction of cover-

age, although the changes were gradual, and even today the few policies providing life indemnity are singularly free from restrictions and technicalities. However, waiting periods were increased, partial disability eliminated or restricted and more use made of the several types of prorating clauses. The average earnings prorating clause, a provision for reduction of indemnities if the coverage exceeds some percentage (usually 100%) of the average earnings during a stated period preceding disability, was introduced as early as 1922, but has never been adopted by all companies. At first this clause applied only to the indemnities under the policy containing the provision, but now the clause generally refers to all types of disability coverage in all companies.

The year 1921 witnessed the end of the initial rush into noncancellable business, and the beginning of the exodus that followed. Some companies had experienced heavy losses, others had met with underwriting difficulties. Several life companies turned to the total and permanent disability benefit in lieu of noncancellable accident and health coverage.

The companies which continued or subsequently commenced to write life indemnity generally experienced increasingly unsatisfactory results, and with four exceptions have either discontinued the noncancellable business entirely or changed to aggregate forms of policies. The four companies which are still offering life indemnity coverage wrote only about 2,200 new policies in 1934, less than 15% of the total 1921 production.

HISTORY AND DEVELOPMENT OF AGGREGATE INDEMNITY POLICIES

In 1918 one company commenced issuing a policy similar to the commercial accident and health policy, except that it was made guaranteed renewable to Age 70, and contained a provision limiting the aggregate indemnity period to sixty weeks. Three years later another company introduced a similar type of policy, except that each period of disability was subject to a specific limit, but no limit was imposed on all indemnities collectively. The latter type of coverage is included in the general term "aggregate indemnity policies," as used in this paper, although the coverage is broader than under the strict aggregate type. Both of the above companies have continued their original coverage to the present date with relatively little change in rates or provisions.

The aggregate indemnity plan was slow to take hold, however, and by 1925 only three companies were issuing it. Since then seven companies have abandoned the life indemnity coverage in favor of the aggregate form, and five of this number continue to write it. These companies have generally adopted a fairly long aggregate period, varying from fifty to one hundred months.

The popularity of the aggregate indemnity coverage is indicated by the volume of new business written in 1934, which was in excess of \$1,500,000 of annual premiums.

PREMIUM RATES

Although at least six companies never made any change in premium rates while active in the noncancellable field, most of the carriers found it necessary to make successive increases. It is difficult to make a direct comparison of the rate levels from year to year because of changes in coverage, but the following schedule of approximate average premiums set by several important companies writing the life indemnity form of contract illustrates the general trend.

TABLE III
AVERAGE RATES CHARGED IN YEAR INDICATED
FOR LIFE INDEMNITY COVERAGE OF \$10 PER MONTH
THREE-MONTH WAITING PERIOD

Age at Issue	1920 Renewable to 65	1930 Renewable to 60	1934 Renewable to 60	Net rate based on 150% Modification of Class III—3% Renewable to 60
20	\$2.00	\$2.50	\$3.50	\$3.07
30	2.00	3.00	4.10	3.92
40	2.00	3.75	5.30	5.27
50	2.00	5.00	7.15	7.52

Comparison of the above gross rates with the net rates according to the 150% Modification of the Class III Disability Table, indicates how inadequate the rates were in the light of current experience under total and permanent disability.

There has been less difficulty and more success in fixing a proper rate for policies with aggregate limits of two years or less. While rates for particular forms have been found to be

somewhat inadequate, the adjustments required have never been serious, and the losses have been absorbed without much difficulty.

EXPERIENCE TABLES FOR THE CALCULATION OF NET PREMIUMS AND RESERVES

Until the introduction of the noncancellable policy the only reserves carried on accident and health insurance were the unearned premium reserve and the reserve for outstanding losses. One company, however, set up special reserves on health insurance on the assumption that the contract would actually be renewed, in most cases, until Age 60.

The absence of any reserve similar to the life insurance reserve was justified chiefly by the cancellation privilege and also by the limited period of sickness covered. The necessity of additional reserves for noncancellable accident and health policies was recognized by most actuaries and underwriters. However, some insurance men, unimpressed by statistics based on the experience of American and British fraternal societies, felt that the unearned premium reserve was a sufficient measure of the liability.

In 1921 the Actuarial Committee of the Bureau of Personal Accident and Health Underwriters made a study of the available statistics which might be adopted as the basis for net premiums and reserves. Finding that there was no domestic experience that would furnish a reliable guide the Committee recommended the use of Cammack's adaptation of the sections of the Manchester Unity Experience (1893-1897) covering agricultural and non-hazardous workers. Objections to this basis were raised by some who pointed to the fact that this table was based on the experience of industrial and farm workers of a different period and of a different country and believed that the rates were higher than would be experienced under noncancellable policies issued to a select group after a rigid medical examination.

Others held an opposite view, and contended that because the Manchester Unity Experience was based on a small benefit that decreased with duration of disability, it did not furnish an adequate measure of the probable losses under noncancellable policies. The experience of the Metropolitan Home Office male employees was cited in confirmation of this theory. This experience covering the years 1915 to 1918 ran 73% of the Manchester Unity

Table for the first three months of sickness and 150% for sickness after three months.

Experience since compiled in this country confirms the opinion of the latter group that the Manchester Unity Table understates the sickness of long duration. As the experience has developed, Cammack's Table has been found a better guide to reserves than to premiums, in the case of life indemnity forms. However, it is quite unsuitable as a reserve standard for policies covering only the first one or two years' sickness.

Several other modifications of the Manchester Unity Experience were prepared. One company adopted as a reserve basis Cammack's Table, adjusted on the assumption that sickness rates would increase 1% in each year. Mr. E. H. Hezlett constructed another table, using Manchester Unity rates for the first two years' sickness, with Hunter's Disability Table applied to trace the claims that extended beyond two years. Both of these tables produced reserves somewhat higher than Cammack's Table.

Another table, known as Maverick's Table, was constructed from experience under commercial accident and health policies for the first year's sickness. Sickness beyond the first year was estimated on the assumption that there would be twice as many claims of at least one year's duration under noncancellable policies as under commercial policies and that each such claim would last for five years. The premiums based on this table were, on the average, about equal to those based on Cammack's Table, but the gradient by age was less, with the result that the reserves were lower.

In 1922 a sub-committee of three Insurance Department Actuaries was appointed by the Committee on Blanks of the National Convention of Insurance Commissioners to make recommendations as to the segregation of noncancellable accident and health financial figures in the convention blank and as to reserve requirements.* This committee gave considerable attention to the question of reserves. A questionnaire addressed to all insurance commissioners disclosed that only three states had any statutory basis for noncancellable reserves, but that seventeen had direct or supervisory authority to impose reserve requirements. Only one reply stated that a ruling had been made.

* The report of this sub-committee is printed in *Proceedings*, X.

A questionnaire was also sent to twelve principal companies writing noncancellable life indemnity policies, which included questions as to the reserve basis used. The replies indicated the following standards:

	Basis used December 31, 1921 No. of Companies	Basis contemplated December 31, 1922 No. of Companies
Cammack's Table	2	4
Modification of Cammack's Table....	1	1
Maverick's Table.....	1	1
Unearned Premium plus Special Sum	—	2
Unearned Premiums Only.....	5	2
Not specifically stated.....	3	2

Obviously there was a wide diversity of opinion and practice with regard to the question of reserves.

The committee stated that it did not recommend any fixed reserve standard at the time, but it emphasized the need for adequate reserves. It was recommended that the companies be requested to test the various tables that had been suggested and, if none were found satisfactory, to develop one as soon as sufficient statistics could be accumulated.

Due to the absence of a time tested experience table based on the types of contracts being issued, and to the lack of departmental regulation, some companies accumulated large volumes of business with inadequate reserves. When, in a few cases, reserve requirements were made retroactive these companies were placed at a considerable disadvantage.

Probably because so many companies have discontinued the business, no table based on the joint experience of companies under the noncancellable life indemnity benefit has yet been published. The first general experience on disability insurance in this country was the Inter Company investigation of disability benefits in life policies, published in 1926. The experience was divided into three classes, but general use has been made only of the class showing the highest claim rates. A table known as Class III was based on this experience. This table was adopted by a number of states as the valuation standard for disability benefits issued after July 1, 1930. Little use has been made of it for noncancellable reserve purposes. Although it develops substantially higher pre-

miums than Cammack's Table, the reserves are only slightly higher.

New York is one of the few states having any legislation regarding noncancellable reserves. Section 93 of its Insurance Laws, prescribes a net premium valuation based on the British Friendly Society Tables and $3\frac{1}{2}\%$ interest. By Departmental Rulings, under the discretionary authority vested in the Superintendent by this law, the requirements were changed in 1926 to Hunter's Table for reserves on active lives and for claims of 27 months or longer duration. In 1931 the ruling was modified to require Cammack's Table for active life reserves and Class III disability experience for the reserve on claims of 27 months or longer duration. For claims of less than 27 months, the reserve is the lesser of the tabular reserve or an amount equivalent to the prospective payments for a period equal to $3\frac{1}{2}$ times the elapsed period of disability, with a minimum reserve of seven weeks' payments. Special standards have been established for some companies, particularly those writing policies with a short aggregate period, for which the above ruling is not applicable.

Information received from fifteen companies indicates that the following bases are now used for active life reserves:

Seven companies use Cammack's Table.

Four companies use their own experience, supplemented in two cases by Class III, and in one case by Cammack's Table.

Hunter's Table, a modification of Cammack's Table, the Class III Table and the 165% Modification of Class III are each used by one company.

Doubtless the uncertainty as to reserve requirements, both from the standpoint of regulation and sound actuarial practice, contributed to the unsatisfactory experience with noncancellable life indemnity coverage.

UNDERWRITING TRENDS

Perhaps the most significant change in underwriting rules is in regard to overinsurance. Limits of issuance have been reduced from as high as \$1,000 monthly indemnity in the early days of the business to \$200 or \$250 today. Limits of participation are generally not over \$500 per month, whereas, in the past, some

insureds have been able to accumulate as much as \$2,000 or even \$3,000 of monthly indemnity by taking the limit in each of several companies.

Most companies now require that at least \$1,000 of accidental death and dismemberment benefits be included in any policy. This is in contrast to the earlier attitude, one of the recommendations made in 1921 by the Underwriting Committee of the Bureau being that no principal sum benefits be allowed under noncancellable policies. Companies which have restricted the principal sum to \$5,000 or \$10,000 have found this feature profitable and satisfactory.

FINANCIAL EXPERIENCE

In order to obtain a proper view of the underwriting results, it is necessary to divide the noncancellable business into two groups, life indemnity forms and aggregate forms. It was found that four companies which have written principally the aggregate form and nine companies which have written the life indemnity form carry over 85% of all the ordinary noncancellable business in the country. As figures on these companies were available back to 1924 from the New York Insurance Reports and other sources, aggregate statistics covering this period were compiled for the two groups of companies. These statistics are presented in the following table.

TABLE IV

Year	NET PREMIUMS WRITTEN		LOSS RATIO (Incurred Basis)		LOSS RATIO (Adjusted)	
	Nine "Life Indemnity" Companies	Four "Aggregate Indemnity" Companies	Life Indemnity	Aggregate Indemnity	Life Indemnity	Aggregate Indemnity
1924	\$4,820,809	\$5,511,000				
1925	5,438,615	6,286,341	116%	70%	109%	69%
1926	6,042,802	7,052,946	103	66	98	65
1927	6,382,936	7,760,745	91	67	85	66
1928	6,958,957	9,519,935	88	64	82	63
1929	7,571,106	10,725,831	87	58	81	57
1930	8,366,305	11,184,940	95	59	89	58
1931	7,641,678*	11,119,529	112	62	105	61
1932	7,379,065	9,845,385	126	67	119	66
1933	6,771,995	8,594,308	186	62	175	61
1934	6,663,706	8,837,149	155	57	146	56

* The drop in premiums in 1931 resulted from the transfer of approximately \$1,000,000 of premiums in one company from the accident to the life department.

The loss ratios were computed according to the formula set forth in the underwriting exhibit of the miscellaneous convention blank. By this formula the increase in the noncancellable reserve as well as the increase in unearned premiums is deducted from the written premiums to obtain the earned premiums. As part of the reserve increase is created from interest earnings, this formula overstates the true loss ratio. Accordingly, an approximate adjustment based on $3\frac{1}{2}\%$ interest was made. The adjusted loss ratios are shown in the last two columns of Table IV.

It is obvious from the above table that the experience under life indemnity coverage has been extremely unsatisfactory. Since the expense ratio has averaged over 30%, this type of insurance has resulted in an underwriting loss during each of the past ten years. Not only have the losses been high for the companies as a whole, but each individual company has shown losses, at least during the past few years.

On the other hand the experience under the aggregate indemnity forms has been satisfactory. To a casualty insurance man, the loss ratio may appear high. However, the contract is not for a one-year term, but covers a long period. This reflects a saving both in commissions, which are lower on renewals than for the first year, and in the expense of issuing policies. As a result expenses may be held at a lower level than is generally possible in other casualty lines.

Included in the figures above for "aggregate indemnity" companies are the results of the company mentioned earlier, which limits each claim to a specific indemnity period without a collective limit on all claims. The loss ratios on the business of this company have been lower than the averages shown for the four companies.

PRESENT TYPES OF COVERAGE

The policy forms now issued by the seventeen active companies vary considerably. To present in full the details of all these policies would require many pages, and would probably be confusing rather than illuminating.

However, an analysis of the provisions of nineteen currently issued policy forms shows that they may be classified in five

general forms, which are listed below in the order of their frequency.

- (a) Policies with an aggregate limit of two years or less and with short waiting periods.
- (b) Policies with an aggregate limit of from 50 to 100 months and with waiting periods up to three months.
- (c) Policies with a limit of two years or less on each individual claim, but with no aggregate limit on all claims.
- (d) Policies paying life indemnity.
- (e) Policies paying indemnity for duration of disability, except that indemnities payable after Age 55 are reduced and no payments are made after Age 70. Only one company issues this type but it is mentioned because of its similarity to the coverage sold in Great Britain.

Premiums for forms (a) and (c) are generally the same for all ages, but with an increase at attained Age 50 regardless of age at issue. On the other forms premiums are graded by age at issue.

An outline of the usual provisions of these forms together with the principal variations follows in Table V:

TABLE V
 OUTLINE OF PROVISIONS OF NINETEEN CURRENT NONCANCELLABLE
 ACCIDENT AND HEALTH POLICY FORMS

Item	Form (a)	Form (b)	Form (c)	Form (d)	Form (e)
Number of Policies	7	5	3	3	1

TYPICAL PROVISIONS

Time limit on Total Disability—Accident Sickness	{Aggregate Limit	{Aggregate Limit	2 years 15 months	{Duration of disability	{Duration of disability to age 70
Time limit on Partial Disability—Accident Sickness	½ rate for 6 mos. Not covered	½ rate for 6 mos. ½ rate for 6 mos.	½ rate for 6 mos. Not covered	½ rate for 6 mos. ½ rate for 6 mos.	2/5 rate for 6 mos. 2/5 rate for 6 mos.
Aggregate Limit Elimination Period	2 years 5 days sickness only	50 months 3 months	None 3 days	None 90 days	None 3 months
Renewable to Benefits at older ages	Age 70 ½ rate after 60	Age 60 No reduction	Age 70 ½ rate after 60	Age 60 No reduction	Age 70 Graduated reduction after 55

VARIATIONS FROM TYPICAL PROVISIONS

Limit of coverage or Aggregate limit	One year, 60 weeks	5 years, 100 months	15 months, 16 months	—	—
Nonconfining sickness	—	—	—	—	—
Reduced rate and limit	3 policies	1 policy	1 policy	1 policy	—
No restriction	4 policies	4 policies	2 policies	2 policies	1 policy
Elimination Period	None to 14 days	None to 3 months	None to 28 days	14 to 90 days	3 to 6 mos.
Renewal Age	60 — 2 pol. 70 — 5 pol.	55 — 1 pol. 60 — 4 pol.	70 — 3 pol.	60 — 3 pol.	70 — 1 pol.
Hospital Benefits	7 policies	2 policies	2 policies	1 policy	1 policy
Nurse Benefits	4 policies	1 policy	1 policy	—	—
Accident Reimbursement	—	1 policy	—	1 policy	—
Elective Indemnities	2 policies	—	—	—	—
No extra benefits	—	3 policies	1 policy	2 policies	—
Definition of Total Disability*	—	—	—	—	—
Type A	4 policies	3 policies	2 policies	2 policies	1 policy
Type B	3 policies	—	1 policy	1 policy	—
Type C	—	2 policies	—	—	—
Prorating Clauses**—	—	—	—	—	—
Std. Prov. No. 1	5 policies	5 policies	1 policy	1 policy	1 policy
Std. Prov. No. 17	3 policies	3 policies	—	—	1 policy
Std. Prov. No. 19	—	1 policy	—	—	—
Average Earnings	1 policy	2 policies	—	—	1 policy
Non-prorating	2 policies	—	2 policies	2 policies	—

* DEFINITION OF DISABILITY—

Type A—Inability to perform the duties of *his* occupation.

Type B—Inability to perform the duties of *any* gainful occupation.

Type C—Same as Type A as to the first year of disability, with Type B applying thereafter.

** PRORATING CLAUSES—

Standard Provision No. 1 prorates the indemnity in event of a change to a more hazardous occupation.

Standard Provision No. 17 prorates in event the insured carries similar insurance with other companies, without disclosing this to the insurer.

Standard Provision No. 19 prorates for concurrent coverage in the same company.

The "average earnings" clause generally restricts the indemnity to the proportion of the insurance that the insured's average earnings during the preceding two years bears to the combined coverage in all companies.

Among the variations from the standard types is a policy which returns to the insured, after twenty years, the excess of one-half the premiums paid over the total claims paid. This policy also contains a nonforfeiture provision in the form of extended insurance. Another policy provides a cash value after premiums have been paid for five years. One life indemnity policy reduces the income 50% after Age 60.

Mention should also be made of the miscalled noncancellable policy which may not be cancelled during the term for which it is written, but which is not guaranteed renewable.

COMPARISONS WITH DISABILITY BENEFITS CONTAINED IN LIFE INSURANCE POLICIES

The subject of disability insurance has been discussed so fully that I will make only a brief review of its history. The benefit was originally introduced by Fraternal Orders. In 1894, the organization of a company which was to specialize in permanent disability insurance was commenced but never completed. Two years later the Fidelity Mutual Life Association, an assessment company which changed to the legal reserve basis in 1899, incorporated the first disability provision in a life insurance policy. This provision granted the insured the option of either a life annuity based on the face amount of the contract, or a fully paid up life policy, either option being in lieu of the other benefits of the policy.

The Travelers Insurance Company originated the waiver of premium benefit in 1904. Other companies adopted the benefit in 1910, and later added provisions for cash benefits in event of total and permanent disability. The various types of benefits were as follows:

Waiver of interest—premiums waived and income payments made to the insured were charged as non-interest bearing loans against the policy.

Annuity certain for twenty years, the total payments aggregating the face of the policy. In event of death within the

twenty years the present value of the unpaid installments was paid in one sum.

Maturity of the contract, the proceeds being paid as an annuity certain or as a life income with a certain number of payments guaranteed.

In 1916 one company adopted a provision granting an annual income of 10% of the face amount of insurance payable for the duration of disability without reduction of the life insurance coverage. This benefit was soon offered by other companies. The income payments were increased to 1% monthly in 1920. Up to this time the benefit was payable only in event of total and presumably permanent disability. Because of the difficulty in establishing permanence several companies changed their clauses in 1921 to provide that total disability of three-months' duration would be considered permanent for the purpose of determining the commencement of liability. The practice of making payments retroactive to the beginning of the three month qualification period was started in 1926. The "professional men's clause" defining disability as inability to perform the duties of *his* occupation was introduced in 1922. In the same year several companies commenced a plan which provided for an increase in the disability income with duration of disability.

During this period of liberalization and rapid growth of the disability provision several unsatisfactory conditions had arisen. Premium rates originally charged were found to be inadequate and as a result disability came to be a losing proposition in many companies. Partly from desire to furnish the broadest possible coverage, and partly in an attempt to outdo competitors, a great variation in policy provisions, underwriting and claim administration had grown up.

In order to standardize the coverage, the Superintendent of the New York Insurance Department appointed, in 1928, a Committee of Actuaries to study the problem. Later in the same year the National Convention of Insurance Commissioners appointed a Committee of Department Actuaries to confer with the New York Committee. The recommendations of the committees were approved by the Convention in 1929. These recommendations, which included a list of standard provisions, were soon adopted

by nineteen states. Following this action the companies generally changed to a four-month qualification period, without retroactive income payments, and adopted substantially higher rates.

It was thought at the time that the disability benefit had been placed on a sound basis, but it was soon found that the new rates were inadequate in the light of current experience. In 1932 drastic revisions were made. Many companies discontinued the income benefit. Others adopted a six month qualification period, reduced the monthly income to $\frac{1}{2}\%$ of the face amount, and based their rates on the 150% or 165% Modification of the Class III Table. At present less than 40% of the companies issue any income benefit and these write it on a very conservative basis.

First year premiums received in 1934 for disability benefits amounted to about 13% of the 1930 receipts. Since most of the 1934 premiums were for the waiver benefit the decline in new disability income business has been greater than this comparison would indicate.

In contrast with the volume of disability benefits written the amount of noncancellable accident and health insurance appears relatively small. The following table shows the noncancellable accident and health premium income of thirteen companies carrying over 85% of the business, and the disability premium income of twenty-five life insurance companies transacting approximately the same proportion of all life business in the country.

TABLE VI

Year	NET PREMIUMS RECEIVED FOR		Percentage of Noncancellable to Disability Benefits
	Total and Permanent Disability Benefits	Noncancellable Accident and Health Insurance	
1915	\$668,030	\$5,000 Est.	1%
1920	7,631,415	3,600,000 Est.	47
1925	25,893,224	11,724,956	45
1930	66,916,861	19,551,245	29
1934	55,436,206	15,500,855	28

The 1915 disability premiums were mostly for the waiver benefit. In the succeeding years shown, until 1934, the income benefit assumed an increasingly large proportion of the total.

The experience under disability benefits in life policies has

been substantially as unsatisfactory as that of the noncancellable life indemnity policies. While the disability benefit was being liberalized doubts had already been raised as to the soundness of the noncancellable accident and health policy, which was being restricted or discontinued entirely. It was thought, however, that there would be distinctly less selection against the company under the disability provision because it was sold only with life insurance and represented, in terms of premiums, only a small percentage of the total coverage. However, even though the insured may have thought little of the benefit when the policy was taken, he soon learned its value. In some cases, the distinction between insurability for life insurance and insurability for disability benefits was overlooked, and often borderline disability risks were accepted to avoid the possibility of losing the life application if disability benefits were denied. The combination coverage placed the applicant in a good trading position, and probably created more underwriting problems than it solved.

It was not until 1928 that efforts were generally made to tighten up on disability practice. Then a vicious cycle set in. As rates were increased and coverage restricted, adverse selection was created. Stricter underwriting requirements rendered the provision less popular with the agency forces, with the result that it was more often bought and less often sold.

While the disability benefit was generally unprofitable, there are a few companies which have not experienced unfavorable results. These companies adhered to conservative underwriting methods and claim administration and generally charged more than the prevailing rate.

One company, which had not previously adopted the disability benefit, brought out a unique form in 1929. It provided that disability which resulted in a reduction of 75% or more in actual earned income, for a period of four months, should be considered total disability. The income under this contract is prorated so that the indemnity payable under all types of disability coverage may not exceed 75% of the average earned income during twelve months preceding disability. While it is too early to draw any definite conclusions regarding this type of benefit, it is significant that the company issuing it has reported a profit from disability in each year since the benefit was first offered.

REASONS FOR UNSATISFACTORY EXPERIENCE WITH LIFE INDEMNITY COVERAGE

The reasons most often cited for the adverse experience under disability benefits and noncancellable accident and health insurance are:

1. Overinsurance at issuance or as a result of curtailed incomes.
2. Inadequacy of premium rates due to the lack of any proper experience tables.
3. Competition in coverage, underwriting and claim administration.
4. Liberalization of the benefits by legal interpretation.
5. The tendency, noted in England over nearly a century, for sickness rates to increase as mortality improves.
6. Education of the insured public to advantages and potentialities of the coverage.

Opinion is divided as to whether, (1) the poor results were chiefly due to improper underwriting and inadequate rates, or (2) disability is a hazard that cannot be insured except within narrow limits. The generally satisfactory results under benefits for waiver of premiums only suggests that overinsurance and selection against the company played a great part in creating the heavy losses. Whether the use of a prorating clause based on average earnings would have materially reduced the losses remains a moot question, as relatively little experience has been accumulated under policies containing this provision.

Two observations may be drawn from the experience with disability benefits and noncancellable accident and health insurance. (a) The concept of the coverage as indemnity for loss of earnings was often disregarded in underwriting the benefits. (b) A policy which guarantees an insured a secure income payable as often and so long as he is disabled places him under a temptation to "enjoy" disability that is often difficult to resist.

FUTURE PROSPECTS FOR NONCANCELLABLE ACCIDENT AND HEALTH INSURANCE

The rapid growth of both noncancellable accident and health insurance and disability benefits during the period that they were

freely offered indicates a real demand for permanent protection against loss of time from sickness and accident. That insurance against this loss has its place in our social order cannot be disputed. To what extent it can be underwritten by insurance companies is debatable.

The view held by many insurance executives, that it is not a proper line for a life insurance company to carry, has the weight of much evidence and sound logic. The underwriting and agency problems seem to arise chiefly from the fact that a prospect insurable for life insurance is often uninsurable for disability benefits, while the reverse is not often the case. It follows then that the disability benefit cannot be treated as a sideline or incidental.

The human equation is involved in the conduct of disability insurance more than in any other line. The principal problems of the business are administrative, rather than technical. The moral hazard, which cannot be eliminated by home office underwriting, must be minimized by selection at the source, through competent, trained and conscientious agents. If disability or noncancellable insurance is an incidental line sold by the general insurance agent, or if it is an adjunct to life insurance which means only a slight additional remuneration to the agent, it will be sold too often to applicants seeking this coverage. In order to secure the broad selection needed for the protection of the company, it is necessary that this business should constitute the agent's principal line. When the agent's livelihood depends upon the sale of this coverage, there will be fewer cases where it is bought by applicants who see the possible advantage to be gained from its abuse.

It is doubtful if a company can successfully write both cancellable and noncancellable accident and health, unless the cancellable contract is distinctly inferior, in scope of coverage, to the noncancellable contract. Otherwise adverse selection will be experienced. Another difficulty in the concurrent issuance of the two types is in the commission scales. Commissions on cancellable insurance are customarily higher, on the average, than on noncancellable. If a company pays a larger commission on cancellable than on noncancellable business, it will be subjected to adverse selection. If it increases the noncancellable commis-

sions, competition will be difficult to meet. If it lowers the cancellable commissions, its business from this source will be curtailed.

The companies which are now successfully writing the bulk of the noncancellable accident and health insurance today, and which will probably continue to do so for some time in the future, are making it their main line. Several of the companies write life insurance, but in these cases the tables are turned, for the noncancellable accident and health is the leading line and the life insurance is supplementary. Since almost any risk acceptable for noncancellable accident and health insurance is insurable for life coverage, the internal problems that have beset the life companies through their disability benefits are not encountered.

If these views are borne out by future experience, it is likely that the noncancellable accident and health business will continue to expand, but it will be written by accident and health companies. The coverage will also be restricted as to the amount of benefits allowed and the length of time for which they will be continued and will only be extended gradually on the basis of mature experience.

It is unfortunate that so little has been written regarding the experience under noncancellable accident and health insurance since the days of its early popularity. As a full account of this subject is desirable for the benefit of the students and for those who might consider venturing into this field, it is hoped that further information will be brought out in the discussion of this paper, and that any wrong impressions will be corrected by those who have followed the experience of noncancellable insurance since its origin.

In gathering the material for this paper a questionnaire was sent to all companies which had written noncancellable insurance. I am indebted to the officials of these companies for their generous cooperation in furnishing the information requested.

A STATISTICAL ANALYSIS OF THE BENEFIT
PROVISIONS OF THE COMPENSATION ACTS

BY

J. J. SMICK

PART I

At the present time in the United States, legislation providing compensation benefits for industrial injury or death exists in all but three states.* Introduced at first in a few states and with modest benefits, workmen's compensation has developed both in its coverage and benefit provisions, until it covers practically all employees, and provides benefits which are often many times greater than those allowed in the early laws. While this particular system of social insurance has thus developed, it has not been accompanied in its development by any other similar systems, although the air is rife with discussions of, and proposals for, various social security programs, to provide against the other vicissitudes of life, which may eventually be incorporated in the social framework.

With the introduction of plans for widespread systems for old age, unemployment and health insurance, it may be that the field of workmen's compensation may lose some of its preeminence; but while it still holds the unique position of the only major system of social insurance which has become an accomplished fact, it is of interest to note the extent to which it provides benefits to the victims of industrial accidents.

Two general lines of investigation will be pursued: in one an attempt will be made to evaluate the average benefits provided by statutes now in effect, and in the other, to analyze the available statistical data in order to determine the actual average amounts paid as benefits over as long a period of time as is feasible. In interpreting the extent to which the compensation principle has been carried, this paper will not concern itself with an analysis of the scope of coverage extended by the compensation acts, but will be confined to an analysis of the benefit provisions.

* Arkansas, Mississippi and South Carolina. A newly enacted Florida law becomes effective July 1.

The three parts of the paper will deal with the basis of determining the relative liberality of the benefit provisions, the method of determining the cost by theoretical estimates, and a comparison of actual results with theoretical estimates.

Preliminary Considerations

To the individual or his family, the immediate economic loss occasioned by an industrial injury is the loss of wage. On the theory that a substitute income must be provided as soon as is reasonably possible, and on the assumption that the employee's wage scale is both the best approximation and the most easily ascertainable measure of his loss, the individual's earnings are used as the basis of compensation payments in practically every state.* The amount of compensation received weekly is usually expressed as a percentage of the average weekly wage, subject to certain minimum and maximum amounts. The compensation laws of the states differ not a little with regard to the amount of this percentage, as well as with regard to the minimum and maximum amounts, the method of computing the average weekly wage, and the benefits provided according to types of injury. The total monetary amounts to be awarded and the duration of time for which the payments shall run are determined separately, and these vary from payments of relatively short durations to payments during continuation of life and from monetary amounts relatively low to amounts relatively high; but apart from these variations, the first point of differentiation in individual benefits is based upon the difference in the wages earned by the individuals injured.

In a sense, and wholly aside from the practical considerations involved, there is an element of justice in determining compensation benefits on the basis of the average weekly wage of the employee. In the majority of cases, and under ordinary conditions, it is reasonable to assume that the expenditures of the employee or his family are determined by his average weekly earnings, and that therefore the minimum disturbance of status is effected by continuing the family income on the basis of a percentage of his actual earnings. The ideal situation, from the

* Exceptions: Washington and Wyoming and some types of benefits in Oregon, Massachusetts and West Virginia.

viewpoint of the injured employee, would be the continuation of his full earnings. Because of fear that in some instances this might be an incentive to malingering, and also possibly with the thought that the employee should in some measure share the economic loss, such a procedure is generally considered impracticable, and the weekly compensation is usually less than the average earnings. Exceptions are commonly made when the income is very low, and the compensation benefits may then be the full wage, or even an arbitrary minimum higher than the wage.

Although practically every state provides that weekly compensation payments shall be based upon average weekly wages, there the similarity ceases. Great variations exist in the methods of determining compensation benefits as well as in the durations and amounts which each act specifies for the employees coming within its jurisdiction. In some instances the benefit provisions may have been influenced by local considerations, in others by historical development, and in some cases perhaps by chance. Whatever the reason, the fact remains that benefits vary widely, and in the majority of states, and with few exceptions, perhaps because the benefit provisions have on the whole not been determined in a manner which will automatically adapt them to changing social and economic conditions, constant attempts are made to modify the existing benefit scales.

During the past year an unprecedentedly large number of proposals seeking to amend the provisions of the compensation acts has been introduced in the various state legislative bodies. This legislative activity may be due to a number of causes. Primarily, the changing economic structure and the prevailing trend of thought toward social legislation has led to an interest in and a review of the only major system of social insurance which is in force in this country. Then, too, there has been in the past a more or less normal tendency to amend the provisions of the compensation acts each year, and to liberalize the benefits. In the last few years, possibly because of the fear of adding to the cost of industrial activity by increasing the benefits and because the legislatures have been busy with more pressing matters, this normal tendency has been nearly at a standstill. Consequently, the number of pending proposals to change the com-

pensation acts has shown a cumulative increase. Although few may be enacted this year, in years to come these measures and many more will be introduced, and eventually many changes may be expected. It is to be hoped that these changes will not continue to be made illogically, motivated simply by the desire for liberalization as so often has been the case in the past, but that consideration will be given to existing benefits and to present and future needs.

Regardless of the channels into which legislative activity may be directed in the future, and wholly aside from any desire to limit changes to those phases most in need of revision, it is of interest to determine, if possible, what the acts allow in their present benefit provisions; and it is of further interest to compare, as closely as is possible, the benefit provisions of each state with those of the others. Due to the rather complex relationship of the various benefit provisions, it is not sufficient merely to compare the phraseology of one law with that of another. It cannot be determined, merely by examination of statutory provisions, whether in the aggregate a provision granting two-thirds of the weekly wage subject to a \$15 maximum is more or less liberal than a benefit provision of one-half of the weekly wage, but with a \$20 weekly maximum. Similarly it is difficult to tell whether 30% paid to the widow with 10% additional for each dependent child provides more than does a flat 50% in all cases, regardless of the number of dependents. Each law must be analyzed separately and the benefit provisions translated into terms of some common unit, which will show, in the aggregate, the proper relationship of the benefit scales.

It would seem to be a fairly simple and acceptable procedure to compare the average amounts paid for injuries in one state with those in another, and to assume that the difference measures the difference in the benefits provided. Apart from other considerations, such a procedure is impracticable simply for the reason that the requisite statistical data to determine such averages for all states and types of injury are not available; and in many of the instances where they are, the statistical data, because of the small number of cases involved, are not sufficient to be indicative. Another objection lies in the fact that two states may have identical benefit provisions, but because of different administrative

policies or industrial conditions, the actual benefits received by the employees differ. Some other procedure must then be utilized in order to compare the relative liberality of the benefit provisions.

The method most frequently used to determine relative values as between law and law proceeds on the basis of monetary amounts. The state providing the most costly benefits is, so far as benefits are concerned, the one which has the most liberal law. There are, however, certain elements which necessitate a modification of this view when applied to compensation benefits for industrial injury. The benefit is a substitute for future earnings; hence, both the duration of time for which the benefits continue and the monetary amount of the benefits are important and must be considered simultaneously. It is not sufficient to argue that the total monetary amount takes into consideration both the periodic payments and the duration. There is such a wide divergence in the weekly wages paid in the various sections of the country, that benefits which seem liberal for one wage scale may not seem so for another. To illustrate, an employee receiving benefits in a state where a low wage scale prevails and earning \$15 weekly may receive weekly compensation of \$10 for a period of ten years. In a state where higher wages prevail, an employee earning \$30 weekly may receive benefits of \$20 for a period of six years. The total payments in the first case amount to but \$5,200, whereas, in the second case there is the greater total of \$6,240. On a present capitalized value basis, considering discount for interest and mortality, the difference is even more appreciable. Yet in the first instance the injured employee receives two-thirds of his wages for ten years and in the second for only six years. On the earlier assumption that the compensation is a substitute for the loss of future earnings of the individual, then the benefits in the first instance are more liberal, even though the total monetary amount is less. It is, therefore, this wide variation in average weekly wages coupled with the assumption as to the purpose of the benefits that tends to vitiate a comparison of the relative liberality of benefit provisions, if the comparison is made solely on the basis of monetary cost.

The extent to which the compensation act achieves the purpose of providing an indemnity commensurate with the actual loss of

future earnings, rather than the mere monetary cost, should be the true measure of the liberality of the compensation act. If one state provides compensation for a period of ten years and another for six years, all other things being equal, the first state is the more liberal in its benefits, even though because of wage scale differences, the monetary amounts in the second are greater.

Under the theory that an accident causes a wage loss, and that compensation is a reimbursement for this loss, it becomes apparent that it is the more logical method to compute relative liberality in units of duration of payment rather than of monetary amounts; and any attempt to amend benefits so as to equal the cost of similar benefits in another state, without using duration also as a measure of the existing difference, must automatically imply an attempt to equalize wage conditions as well.

For this reason, it is not sufficient to express the benefits provided by the several laws in units of monetary amounts if the results are to be truly indicative. It is necessary to go a step further and determine benefits in units of weeks of wages. This additional step is simple to take. If the average monetary cost is first determined and then divided by the average weekly wage, the result is a duration of payments expressed in units of weeks of wages.

THE TABLE OF RELATIVE COSTS AND EQUIVALENT DURATIONS

Table 1, hereto annexed, shows both the monetary amounts, computed on the basis of the benefits provided by law, and the equivalent durations expressed in units of average weekly wages. These average monetary amounts are based upon calculations using the average weekly wages, and a standard accident table* containing the relative frequency of various types of injuries, as well as the kinship and number of dependents. In addition to the accident table a standard wage distribution† has also been utilized.

The variations in monetary amounts indicate both the difference due to benefit provisions and that due to wage scales. The

* The American Accident Table. Olive E. Outwater, *Proceedings*, Volume VII.

† *Legal Limits of Weekly Compensation in Their Bearing on Rate making for Workmen's Compensation Insurance*. A. H. Mowbray, *Proceedings*, Volume IX.

durations are the criteria for measuring the actual extent to which the benefits provide a substitute for the loss of wage income.

In many of the states the average weekly wage used as a basis for the calculation of the aggregate cost of the benefits is of great importance, in others it is of less significance. Although in general the average cost of a case will increase if the average wage increases, the durations may not be similarly affected. In case of laws which provide benefits not influenced by the wage scale or which have low monetary maxima, an appreciable increase in the wage scale may only slightly affect the average cost and may decrease the durations considerably. It is therefore always necessary to bear in mind, when using the table, all three elements, the average weekly wage, the average monetary cost and the average duration.

Table 2, hereto annexed, illustrates the effect of the average wage scale. It exhibits the identical data, average cost and average duration, upon the basis of an average weekly wage of \$28.37 for each state. This wage is higher than the wage used in any of the states in Table 1. The two tables therefore illustrate both the general effect of a decrease in wages upon the average cost and duration, and the difference ensuing when a single wage is used for all states. It is of interest to note that although the average costs, in general, drop with a lowering of the wage scale, the decrease in wages is relatively much greater than the decrease in costs; and that durations, expressed in units of the lower wage, increase. In view of the fact that the fall in wages since 1929 has been great, this would seem to indicate, that despite the drop in average costs, and despite the partial cessation of legislative activity, the benefits, expressed in units of durations, have been increasing. The benefit provisions of a compensation act, when limited by maxima and minima to weekly compensation, and to total monetary amounts and durations, may provide a more adequate substitute for actual loss of income on a low wage scale than on a high. In general they do so.

The table of relative costs and equivalent durations, inasmuch as it was calculated upon theoretical estimates, is correct in a general way only and is further subject to discount for a number of reasons. Because of the great amount of labor and time in-

volved in obtaining the figures, many approximations were used. The average weekly wages used in the calculations may or may not be indicative of current conditions. It is hoped that they are at least approximately correct. The figures furthermore do not disclose the important difference attributable to the method used in determining the average weekly wage. A law which specifies that the average weekly wage shall be six times the daily wage, provides a greater basis for compensation, in the instance where actually the individual works only 3 or 4 days a week, than does a law which specifies that the actual average weekly wages received shall be used.

The durations are of course not merely the averages of the durations specified in the laws, but are the net result of the effect of mortality, of discount for interest, where these are important, of monetary limits, and of the other elements to which it is possible to give consideration in arriving at a theoretical average cost. While values are shown for fatal, permanent total disability, major permanent partial, minor permanent partial, temporary total, and all of these benefits combined, the latter two are perhaps least indicative. This is because the American Accident Table includes in its distribution all cases of temporary total disability, both compensable and non-compensable. Of the total 100,000 accidents in the distribution, 95,388 are temporary total cases, where the disability lasts for a period of one day or more. Most of the states provide for waiting periods during which time no compensation is payable. Consequently many cases never receive compensation and the use of the full 95,388 cases tends to decrease the averages to unusually low figures. Actually the amounts paid in compensable temporary total cases, are very much greater. Similarly the use of the full number of cases tends to show an unusually low average for all benefits combined. A somewhat analogous situation occurs in the fatal group. Of the total of 762 cases included, 174 are cases with no dependents, which in most states receive only funeral benefits.

There are certain inferences, very natural to make, which none the less should not be made from this table. The fact that differences are indicated on the basis of an estimate of the statutory benefit provisions does not imply that such differences will actually be realized. No such conclusion is warranted. Actual results

will take into consideration such factors as administrative policy, differences in predominating industries, typical injuries, character and dependency conditions of the industrial population and many other elements which not only are not reflected in these tables, but have, in fact, been deliberately excluded in order to emphasize the differences in statutory benefit provisions. It is true that a change in the benefit provisions will affect the average cost of the provisions, but it does not necessarily follow that by changing the benefit provisions to agree with those of any other state the same actual cost will be realized. This can only be possible if the two states, in addition to possessing identical benefit provisions, have the same administrative policies, wage scales, types of industry and industrial population, and any other conditions which have effect upon actual cost.

One important group of benefits for which no values are shown is that of medical benefits. This is due to the fact that the American Accident Table, which is used as the standard distribution, does not contain a subdivision for medical benefits, and to the further fact that the liberality of the medical allowances is largely dependent upon the prevailing medical and surgical fees and hospital charges of the particular state. Those states which provide for unlimited medical treatment both in amount and duration are, subject to the limitation of the service available, on a par; but it is difficult to determine whether a given sum of money will purchase the same degree of medical treatment in one state that it will in another. It is even doubtful whether the same treatment can be purchased in different localities of the same state for the same fee. Instead, therefore, of including values for the medical provisions with the other types of benefits, the actual medical provisions, which can be easily summarized, are shown separately in Table 5.

In addition to the two tables depicting the theoretical estimates of the benefits provided by the compensation acts and the summary of the medical provisions, a statistical analysis of the actual average incurred cost of fatal, permanent total disability, and major permanent partial disability cases as well as the average of these three is presented in Table 4. These data cover a period of 15 years and are based upon statistical reports compiled in most of the years, for about 36 states for which data were

available. It was not possible to prepare a similar exhibit for the minor permanent partial and temporary total cases, but the fatal, permanent total and major cases are the serious ones, and it may safely be said the types of cases wherein the benefits are of utmost importance. The summaries are presented on Graph I and separately, on Graph II are shown, on a somewhat enlarged scale, the data for both the average cost for all injuries combined and for the changes in average weekly wages. As was to be expected, with a fall in the average weekly wages, the average costs decreased, but not nearly to as great an extent as that indicated by the actual decrease in wages.

An illustration of the effect of average weekly wages upon the average estimated amount of benefits and equivalent durations is shown in Table 3 comparing the average costs and durations, for countrywide figures, on the two wage bases used in determining the tables of relative costs and equivalent durations. This indicates very clearly that the costs are not decreased in the same proportion as the wages, and that on a lower wage scale the average equivalent durations are much greater, and provide a relatively greater measure of compensation for the loss of income.

NOTE. Possibly not an integral part of the subject under consideration, but nevertheless of some interest, is the table shown below, compiled from the report* of the New York Insurance Department, giving the number of policies and amount of insurance in force for all life insurance companies. The average amount of insurance in force on a policy has been computed for industrial policies, all ordinary policies, and the aggregate of the two. These figures may be compared to the average amounts provided by the compensation acts. There are of course cases where an individual has more than one policy, but when it is considered that life insurance is also in many cases a form of saving and many policies for large amounts are included, it would seem to indicate that the compensation benefits are on the whole greater than the average amount of insurance in force on a policy. In case of an industrial fatality, the family of the employee, will on the average, using countrywide figures, either actual or theoretical, have an income provided by law, greater than that of the average life insurance policy.

	Number of Policies	Amount of Insurance in Force	Average per Policy (Approximate)
Industrial Business.	74,526,630	\$15,625,205,644	\$200
All Other	25,807,192	74,716,119,318	2,900
Aggregate	100,333,822	90,341,324,962	900

* New York Insurance Report 1932, Part II, Life-Table VIII, all states, for companies reporting data as of December 31, 1931.

TABLE 1
RELATIVE COSTS AND EQUIVALENT DURATIONS

Estimated average cost per case, based on the indicated average weekly wage, and equivalent duration of payments, expressed in numbers of weeks at the full average weekly wage, calculations made using the American Accident Table and the Benefit Provisions of the Compensation Acts effective May 1, 1935. These values are based solely on theoretical estimates.

State	Average Weekly Wage	TYPE OF BENEFIT											
		Fatal		Permanent Total Disability		Major Permanent Partial Disability		Minor Permanent Partial Disability		Temporary Total Disability†		All Types of Disability†	
		Average Cost Per Case	Equivalent Duration In Weeks	Average Cost Per Case	Equivalent Duration In Weeks	Average Cost Per Case	Equivalent Duration In Weeks	Average Cost Per Case	Equivalent Duration In Weeks	Average Cost Per Case	Equivalent Duration In Weeks	Average Cost Per Case	Equivalent Duration In Weeks
Ala.	\$15.39	\$1,416	92	\$2,842	185	\$968	63	\$301	20	\$13.21	0.9	\$43	2.8
Ariz.	23.13	5,801	251	12,790	553	2,254	97	597	26	34.95	1.5	123	5.3
Cal.	22.78	2,647	116	8,124	357	1,850	81	501	22	25.51	1.1	81	3.6
Colo.	22.33	2,384	107	9,078	407	1,699	76	270	12	16.12	0.7	63	2.8
Conn.	20.53	2,378	116	4,289	209	1,812	88	450	22	19.56	1.0	69	3.4
Del.	21.00	1,697	81	3,197	152	1,313	63	378	18	19.50	0.9	56	2.7
D. C.	21.00	4,253	203	5,978	285	2,727	130	642	31	25.35	1.2	102	5.0
Ga.	15.24	1,421	93	2,301	151	984	65	314	21	13.28	0.9	43	2.8
Idaho	19.98	2,776	139	6,888	345	1,533	79	321	16	21.13	1.1	69	3.5
Ill.	22.31	2,826	127	8,195	367	1,867	84	599	27	22.63	1.0	83	3.7
Ind.	19.53	2,374	122	4,113	211	1,764	90	486	25	19.40	1.0	69	3.5
Iowa	20.80	2,515	123	3,909	191	1,432	70	356	17	17.17	0.8	61	3.0
Kans.	20.18	2,462	122	4,149	206	1,652	82	466	23	20.69	1.0	70	3.5
Ky.	17.70	2,355	133	3,750	212	1,215	69	364	21	18.86	1.1	60	3.4
La.	17.02	1,797	106	3,712	218	1,307	77	340	20	20.12	1.2	57	3.3
Me.	18.83	2,239	119	4,574	243	1,991	106	730	39	21.32	1.1	79	4.2
Md.	19.59	3,278	167	4,224	216	1,797	92	460	23	27.51	1.4	84	4.3
Mass.	21.39	3,178	149	4,223	197	1,982	93	373	17	26.09	1.2	81	3.8
Mich.	21.22	2,954	139	5,454	257	1,602	75	499	24	24.67	1.2	78	3.7
Minn.	21.54	4,007	186	7,391	343	2,429	113	590	27	26.68	1.2	100	4.6
Mo.	19.69	2,827	144	7,109	361	1,702	86	561	28	28.24	1.4	85	4.3
Mont.	23.29	3,396	146	6,207	224	1,552	67	311	13	24.07	1.0	75	3.2
Neb.	19.77	2,998	152	8,250	417	1,963	99	510	26	22.17	1.1	82	4.1
Nev.	21.00	4,634	221	9,770	465	1,723	82	474	23	29.03	1.4	99	4.7
N. H.	19.08	2,221	116	2,561	134	1,088	67	170	9	22.01	1.2	54	2.8
N. J.	23.36	2,759	118	12,829	549	2,187	94	671	29	27.27	1.2	94	4.0
N. Mex.	21.40	1,875	85	4,969	232	1,374	64	305	14	19.84	0.9	58	2.7
N. Y.	23.58	5,437	231	14,674	622	2,872	122	677	29	28.12	1.2	123	5.2
N. C.	15.00	3,124	208	3,159	209	1,313	88	394	26	17.81	1.2	66	4.4
N. D.	21.00	5,200	248	9,370	446	2,217	106	460	22	30.92	1.5	109	5.2
Ohio	21.00	3,678	175	11,461	546	2,096	100	505	24	23.42	1.1	91	4.3
Okla.	19.17	.	.	5,291	276	1,930	101	523	27	24.04	1.3	59*	3.1*
Ore.	21.00	4,676	223	7,628	363	1,515	72	405	19	26.28	1.2	91	4.3
Pa.	21.00	2,300	114	4,874	232	1,877	89	545	26	22.11	1.1	75	3.6
R. I.	20.33	1,936	95	3,940	194	1,396	69	319	16	19.50	1.0	58	2.9
S. D.	19.69	2,000	102	2,318	118	1,475	75	431	22	26.93	1.4	68	3.5
Tenn.	15.38	1,751	114	3,031	197	928	60	280	18	14.28	0.9	45	2.9
Texas	20.75	3,117	150	4,179	201	1,502	72	452	22	23.57	1.1	76	3.7
Utah	20.63	2,820	137	8,664	420	1,648	80	339	16	25.20	1.2	76	3.7
Vt.	17.68	1,184	67	2,125	120	1,188	67	266	15	15.56	0.9	44	2.5
Va.	15.70	1,939	124	3,442	219	1,213	77	358	23	15.98	1.0	54	3.4
Wash.	21.00	5,111	243	8,979	428	1,676	80	458	22	26.97	1.3	99	4.7
W. Va.	21.00	3,963	189	11,042	526	1,980	94	597	28	22.56	1.1	94	4.5
Wis.	19.92	3,456	173	8,558	430	2,737	137	549	28	25.11	1.3	97	4.9
Wyo.	21.00	1,904	91	4,253	203	1,664	79	321	15	28.04	1.3	68	3.2
All	20.08	2,935	146	6,152	299	1,712	85	443	22	22.73	1.1	76	3.7
N. Y.**	23.58	5,437	231	14,674	622	2,979	126	703	30	28.88	1.2	126	5.3
Fla.**	15.43	1,737	113	2,572	167	1,200	78	363	24	14.02	0.9	50	3.2

**Effective July 1, 1935.

*Determined by substituting the actual average cost of a fatal case, on the basis of common law. This was done because the Oklahoma Compensation Act excludes death from its coverage.

†As previously explained, this average cost is for all temporary total cases inclusive of those not entitled to benefits because of the waiting period provisions. Consequently these values are much lower than the average for those actually receiving benefits.

TABLE 2

RELATIVE COSTS AND EQUIVALENT DURATIONS—BASED ON A SINGLE AVERAGE WAGE FOR ALL STATES

Estimated average cost per case, based on an average weekly wage of \$28.37, and equivalent duration of payments, expressed in numbers of weeks at the full average weekly wage of \$28.37. Calculations made using the American Accident Table and the Benefit Provisions of the Compensation Acts effective May 1, 1935. These values are based solely on theoretical estimates.

State	TYPE OF BENEFIT											
	Fatal		Permanent Total Disability		Major Permanent Partial Disability		Minor Permanent Partial Disability		Temporary Total Disability†		All Types of Disability†	
	Average Cost Per Case	Equivalent Duration In Weeks	Average Cost Per Case	Equivalent Duration In Weeks	Average Cost Per Case	Equivalent Duration In Weeks	Average Cost Per Case	Equivalent Duration In Weeks	Average Cost Per Case	Equivalent Duration In Weeks	Average Cost Per Case	Equivalent Duration In Weeks
Alabama.....	\$2,142	76	\$3,962	140	\$1,400	49	\$436	15	\$19.11	0.6	\$82	2.2
Arizona.....	7,013	247	15,688	553	2,756	97	730	26	42.03	1.5	150	5.3
California.....	3,071	108	9,841	347	2,240	79	606	21	30.85	1.1	97	3.4
Colorado.....	2,728	96	10,462	369	1,927	68	311	11	18.58	0.7	72	2.5
Connecticut.....	3,142	111	5,793	204	2,448	86	607	21	26.37	0.9	93	3.3
Delaware.....	2,066	73	3,449	122	1,617	57	465	16	23.96	0.8	69	2.4
Dist. of Col.....	4,419	156	6,294	222	3,527	124	830	29	32.79	1.2	129	4.5
Georgia.....	2,292	81	3,727	131	1,624	57	517	18	21.88	0.8	70	2.5
Idaho.....	3,189	112	7,393	261	2,055	72	487	17	23.89	0.8	85	3.0
Illinois.....	2,874	101	8,343	294	2,117	75	662	23	25.63	0.9	92	3.2
Indiana.....	2,952	104	4,370	154	2,212	78	609	21	24.29	0.9	86	3.0
Iowa.....	2,944	104	4,618	163	1,692	60	420	15	20.25	0.7	72	2.5
Kansas.....	2,938	104	5,279	186	2,103	74	592	21	26.28	0.9	87	3.1
Kentucky.....	2,730	96	4,764	168	1,416	50	425	15	24.32	0.9	72	2.5
Louisiana.....	2,742	97	5,600	197	1,972	70	513	18	30.30	1.1	86	3.0
Maine.....	2,756	97	5,157	182	2,587	91	949	33	27.65	1.0	102	3.6
Maryland.....	3,491	123	4,422	156	2,274	80	582	21	35.96	1.3	101	3.6
Massachusetts.....	3,186	112	4,306	152	2,023	71	416	15	30.34	1.1	87	3.1
Michigan.....	3,454	122	6,444	227	1,893	67	590	21	29.10	1.0	92	3.2
Minnesota.....	4,356	154	7,772	274	2,906	102	708	25	31.98	1.1	116	4.1
Missouri.....	3,963	140	8,870	313	2,216	78	730	26	36.70	1.3	112	3.9
Montana.....	3,814	134	5,891	208	1,756	62	351	12	27.21	1.0	85	3.0
Nebraska.....	3,464	122	9,993	352	2,284	81	593	21	25.75	0.9	95	3.3
Nevada.....	5,533	195	11,020	388	2,055	72	563	20	34.01	1.2	117	4.1
New Hampshire.....	2,808	99	3,328	117	1,413	50	227	8	28.56	1.0	72	2.5
New Jersey.....	3,040	107	14,385	507	2,452	86	752	27	30.52	1.1	105	3.7
New Mexico.....	2,220	78	5,782	204	1,603	57	355	13	23.05	0.8	67	2.4
New York.....	6,138	216	15,451	545	3,228	114	760	27	32.79	1.2	139	4.9
North Carolina.....	4,764	169	4,876	172	2,125	75	638	22	28.78	1.0	105	3.7
North Dakota.....	5,824	205	10,269	362	2,732	96	567	20	38.09	1.3	129	4.5
Ohio.....	4,221	149	13,866	489	2,537	89	611	22	28.29	1.0	109	3.8
Oklahoma.....	.....	.....	6,450	227	2,485	88	659	23	30.45	1.1	95*	3.3*
Oregon.....	4,876	165	7,628	269	1,549	55	416	15	31.73	1.1	96	3.4
Pennsylvania.....	2,659	94	5,178	183	2,066	73	600	21	24.43	0.9	83	2.9
Rhode Island.....	2,204	78	4,371	154	1,538	54	351	12	24.74	0.9	67	2.4
South Dakota.....	2,113	74	2,858	101	1,820	64	532	19	33.17	1.2	82	2.9
Tennessee.....	2,768	98	4,261	150	1,532	54	466	16	23.70	0.8	74	2.6
Texas.....	3,895	137	5,288	186	1,890	67	572	20	29.76	1.0	95	3.3
Utah.....	3,354	118	10,836	382	1,985	70	409	14	30.12	1.1	91	3.2
Vermont.....	1,746	62	3,000	106	1,877	59	376	13	21.92	0.8	62	2.2
Virginia.....	2,746	97	4,492	158	1,760	62	519	18	23.16	0.8	77	2.7
Washington.....	5,111	180	8,979	317	1,676	59	458	16	26.97	1.0	99	3.5
West Virginia.....	3,992	141	12,628	445	2,264	80	682	24	25.78	0.9	103	3.6
Wisconsin.....	4,550	160	11,995	423	4,223	149	751	26	41.65	1.5	142	5.0
Wyoming.....	1,904	67	4,253	150	1,664	59	321	11	28.04	1.0	68	2.4
All States— Arithmetic Aver.	3,454	122	7,192	254	2,118	75	549	19	28.33	1.0	93	3.3

*Determined by substituting the actual average cost of a fatal case, on the basis of common law. This was done because the Oklahoma Compensation Act excludes death from its coverage.

†As previously explained, this average cost is for all temporary total cases inclusive of those not entitled to benefits because of the waiting period provisions. Consequently these values are much lower than the average for those actually receiving benefits.

TABLE 3
COMPARISON OF AVERAGE COSTS AND EQUIVALENT DURATIONS FOR
DIFFERENT WAGE LEVELS COUNTRYWIDE AVERAGES

KIND OF BENEFIT	Average Cost per Case Theoretical Estimates		Indi- cated Change	Average Equiva- lent Duration		Indi- cated Change
	Table 2	Table 1		Table 2	Table 1	
Fatal	\$3,454	\$2,935	.850	122	146	1.197
Permanent Total..	7,192	6,152	.855	254	299	1.177
Major	2,118	1,712	.808	75	85	1.133
Minor	549	443	.807	19	22	1.158
Temporary Total...	28.33	22.73	.802	1.0	1.1	1.100
All Benefits.....	93	76	.817	3.3	3.7	1.121
Average Wage....	28.37	20.08	.708			

TABLE 4
EXHIBIT OF ACTUAL AVERAGE INCURRED COSTS PER CASE —
FOR SERIOUS INJURIES*

Year	TYPE OF BENEFIT							
	Fatal		Permanent Total		Major Permanent Partial		All Serious Cases	
	No. of Cases	Average Incurred Cost per Case	No. of Cases	Average Incurred Cost per Case	No. of Cases	Average Incurred Cost per Case	No. of Cases	Average Incurred Cost per Case
1932	2,759	\$3,686	194	\$7,189	4,363	\$2,327	7,316	\$2,968
1931	3,368	3,887	315	7,662	5,497	2,600	9,180	3,246
1930	4,283	4,020	373	8,306	7,005	2,675	11,661	3,349
1929	4,983	4,034	458	8,396	8,416	2,718	13,857	3,379
1928	4,667	4,046	458	8,569	7,778	2,679	12,903	3,383
1927	4,645	3,908	430	7,798	7,199	2,612	12,274	3,284
1926	4,419	3,878	399	7,685	7,219	2,477	12,037	3,164
1925	4,287	3,782	401	7,889	6,738	2,456	11,426	3,144
1924	4,021	3,677	374	7,582	6,216	2,368	10,611	3,048
1923	4,216	3,550	360	6,949	6,463	2,317	11,039	2,939
1922	3,612	3,217	375	6,568	5,943	2,125	9,930	2,690
1921	2,999	3,123	315	6,795	4,793	2,106	8,107	2,665
1920	2,942	3,205	332	6,840	4,977	2,121	8,251	2,697
1919	3,013	2,944	424	5,785	5,441	1,956	8,878	2,474
1918	2,839	2,762	401	5,718	4,555	1,766	7,795	2,332
All Years	57,053	3,643	5,609	7,348	92,603	2,395	155,265	3,033

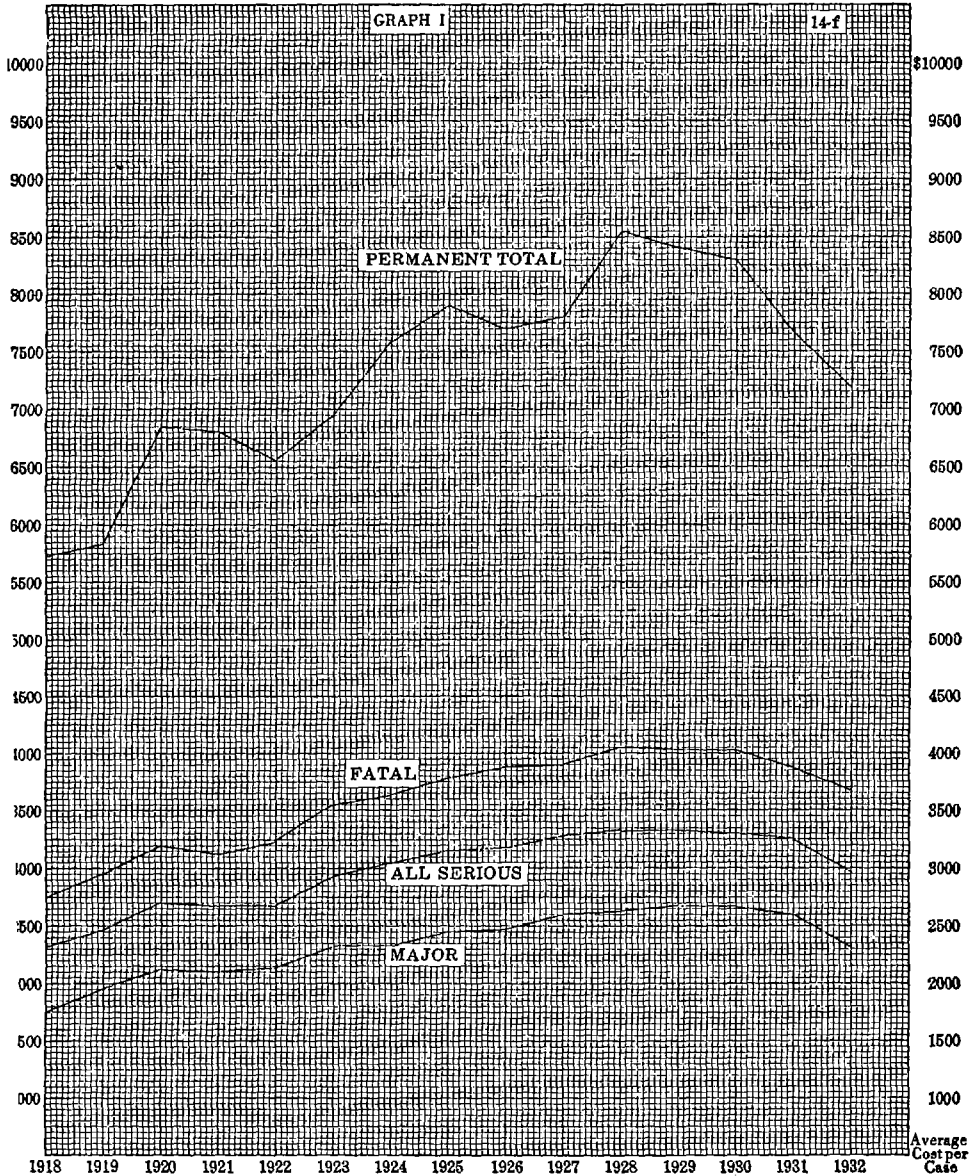
* Based on Policy Year data for the following States; for the years available.

- | | | | |
|----------------------|---------------|----------------|--------------|
| Alabama | Indiana | Minnesota | Oklahoma |
| Arizona | Iowa | Missouri | Rhode Island |
| California | Kansas | Montana | South Dakota |
| Connecticut | Kentucky | Nebraska | Tennessee |
| District of Columbia | Louisiana | New Hampshire | Texas |
| Colorado | Maine | New Jersey | Utah |
| Georgia | Maryland | New Mexico | Vermont |
| Idaho | Massachusetts | New York | Virginia |
| Illinois | Michigan | North Carolina | Wisconsin |

TABLE 5
SUMMARY OF MEDICAL BENEFITS PROVIDED BY THE VARIOUS
STATE COMPENSATION STATUTES*

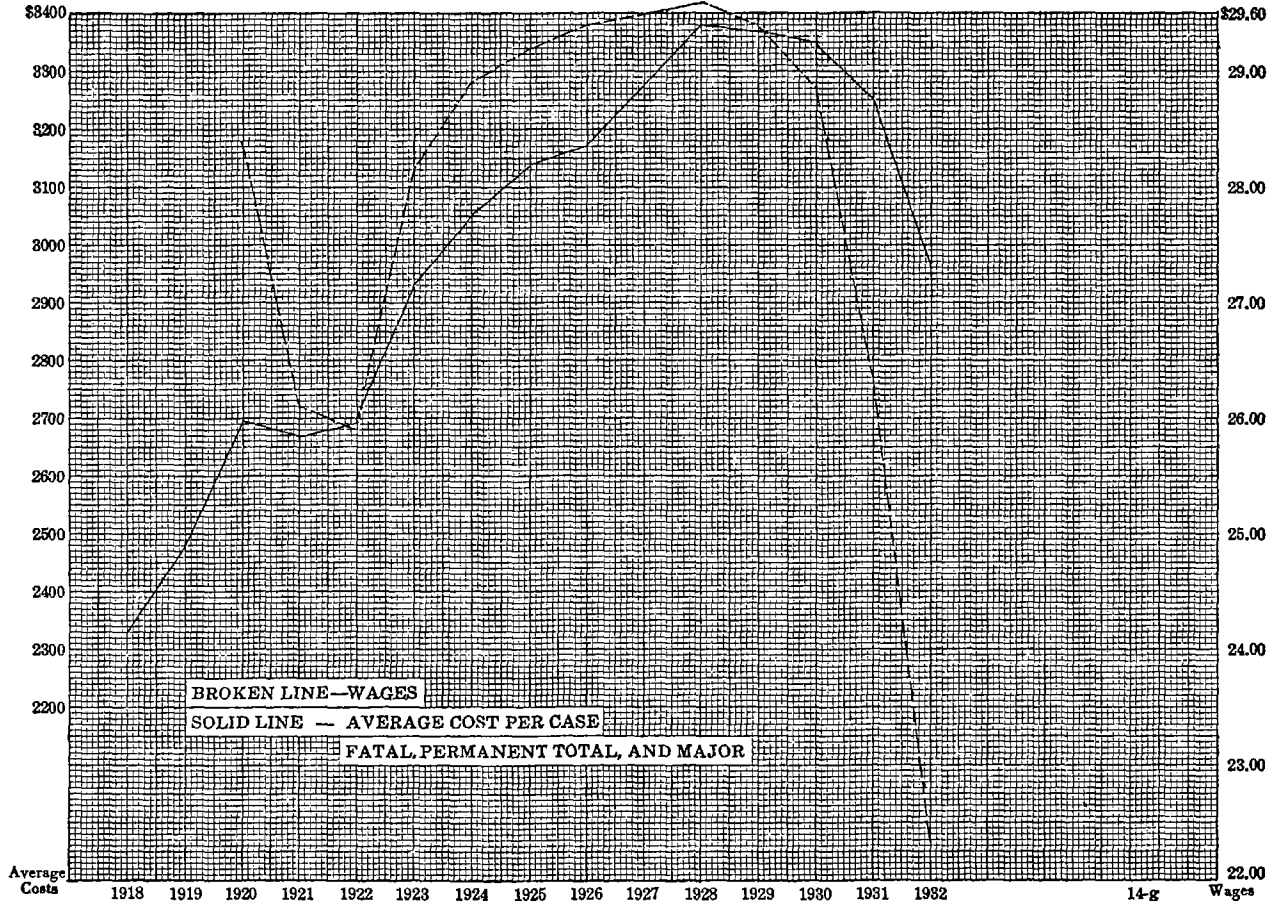
State	Medical Provisions	
	Maximum Amount	Maximum Duration
Alabama	\$100	60 days
Arizona	Unlimited	1 year may require employees to contribute half cost of insurance, max. \$1.00 a month per employee
California	Unlimited	Unlimited
Colorado	500	4 months
Connecticut	Unlimited	Unlimited
District of Columbia..	Unlimited	Unlimited
Delaware	150	30 days
Georgia	100	30 days
Idaho	Unlimited	Unlimited
Illinois	Unlimited	Unlimited
Indiana	Unlimited	60 days
Iowa	300	Unlimited
Kansas	500	Unlimited
Kentucky	200	Unlimited
Louisiana	250	Unlimited
Maine	Unlimited	Unlimited
Maryland	500	Unlimited
Massachusetts	Unlimited	Unlimited
Michigan	Unlimited	90 days
Minnesota	Unlimited	Unlimited
Missouri	Unlimited	Unlimited
Montana	500	6 months
Nebraska	Unlimited	Unlimited
Nevada	Unlimited	1½ years may collect one-half cost from employees max. \$1.00 a mo. per employee
New Hampshire	Unlimited	30 days
New Jersey	Unlimited	Unlimited
New Mexico	350	Unlimited
New York	Unlimited	Unlimited
North Carolina	Unlimited	Unlimited
North Dakota	Unlimited	Unlimited
Ohio	Unlimited	Unlimited
Oklahoma	Unlimited	Unlimited
Oregon	Unlimited	Unlimited
Pennsylvania	100 med. and unlimited hospital treatment for 30 days	30 days
Rhode Island	150	8 weeks
South Dakota	200	12 weeks
Tennessee	200	30 days
Texas	Unlimited	6 weeks
Utah	Unlimited	Unlimited
Vermont	50	14 days
	150	Plus hospital
Virginia	Unlimited	30 days
Washington	Unlimited	180 days
	Unlimited	Unlimited
	separate medical aid fund from assessments on employers one-half of which may be collected from employees	
West Virginia	800 plus an additional 600 if permanent disability may be reduced thereby	Unlimited
Wisconsin	Unlimited	Unlimited
Wyoming	300	Unlimited

* Where benefits are not subject to definite limitation but may be extended indefinitely by commission ruling or otherwise, the word "unlimited" is used. Compiled as of May 1, 1935.



AVERAGE COST PER CASE—FOR ALL STATES FOR WHICH DATA WERE AVAILABLE

GRAPH II



PART II

*The Determination of the Cost of the Benefits—
by Theoretical Means*

In the foregoing part of this paper, the basis for a table of relative costs and durations is discussed and a table based upon certain assumptions has been constructed. It is proposed, in this part, to give a more careful analysis of the detailed procedure followed in the construction of this table, with appropriate examples of the details of the calculation.

In order to determine the cost of any given set of benefit provisions there are only two basic sets of data required. One of these is a detailed analysis of the benefits payable for various types of injuries and to dependents in case of death, and the other is a distribution of the recipients of these benefits in classifications comparable to those for which the benefits are outlined. The sum of the benefits received by each case will naturally equal the total cost of the benefits. This procedure reduces the problem to its simplest terms. In actual practise other considerations enter. In the first place, it is necessary to have a distribution of accidents and dependency conditions containing a large enough number of cases to be an indicative distribution. In the second place, since benefits in the majority of cases are payable as a percentage of wages, further complicated by the introduction of weekly minimum and maximum limits as well as limits to total monetary cost, it is necessary to obtain either the actual wages upon which compensation will be paid, or else a wage distribution which may be used as an acceptable substitute.

When the first compensation acts were introduced there were many divergent estimates of the possible cost of the various types of benefits. It was recognized early that both for the purposes of estimating the cost of future changes in benefit provisions, as well as for the purposes of the early rate making systems, it would be necessary to have available, as far as possible, standard distributions which would assist in the calculations. Of particular importance are two such distributions, the American Accident Table and the standard wage distributions.

The American Accident Table, fully described in an earlier paper in the *Proceedings*, is reproduced in the form most convenient for use in calculating the cost of benefit provisions.* It is sufficient to state that this distribution is based upon statistics of some 500,000 accidents and was compiled with great care and thoroughness. It is of course doubtful whether the distribution is typical of actual conditions in any state, but it is based upon a larger volume of data than is available in any one state and at least one check was made many years subsequent to its original compilation which showed the table to be essentially correct in the light of statistics available at that date.

The other standard distribution which is used is the wage distribution on which is based the calculation of the effect of limits to compensation. This is needed because of the work which would be entailed if it were attempted to calculate the effect of the minimum and maximum weekly limits, which work would be greatly increased and require the detailed wage distributions for each state to complete the calculation. Possibly a somewhat fuller explanation of the effect of the limits may be made here, even though the subject has been discussed by others.

If the percentage of compensation were 50 and the minimum were \$5 and the maximum \$21, only those cases whose average wages were between \$10 and \$42 would receive compensation at the rate of 50%. The others would receive either the minimum of \$5 (if the average weekly earnings were below \$10) or else the maximum of \$21 (if the average weekly earnings were above \$42).

An example of the required calculation is shown in Table 7, Effect of Limits.

Fortunately, however, a standard wage distribution and a technique for its use has been developed† which greatly shortens the amount of labor required and obviates the necessity for obtaining a wage distribution each time the effect of limits has to be calculated.

* See forms C 1, 2 and C 3, 4, 5, Tables 9 and 10.

† A. H. Mowbray—cf. previous citation.

W. W. Greene—The Compensation Ratemaking Problem in the Light of 1923-1924 Revision, *Proceedings*, Vol. X.

Paul Dorweiler—On Variations in Compensation Losses with Changes in Wage Levels, *Proceedings*, Vol. XVIII.

It is now possible to summarize the steps which must be taken in the calculation of the cost of a set of benefit provisions. These are:—

1. An analysis in detail of the benefit provisions of a compensation act. This must be in a form suitable for use with the American Accident Table. Such an analysis is shown in Table 8.
2. The determination, in units of weeks wages, of the cost of providing these benefits to the beneficiaries listed in the American Accident Table. The details of this procedure are shown in Tables 9 and 10. An additional explanation of the various steps is also made.
3. The evaluation, on the basis of the standard wage distribution, of the effect of the minimum and maximum weekly limits.
4. The determination of the monetary cost, on the basis of the number of weeks wages, the effect of the limits, and the average weekly wage. This is shown in Table 11.

In Table 12 the calculations underlying the average values used in the table of relative costs and equivalent durations are shown in detail. Essentially the process consists of determining the average cost of a case and from this value then deriving what the average duration of payments would be if the weekly compensation were the full average weekly earnings.

Probably of more practical importance are the calculations outlined in Tables 13 and 14. In these tables are shown the final steps in determining the average over-all effect of a proposed change in a given set of benefits. The procedure consists of calculating first the monetary cost of the present benefits and then the cost of the proposed benefits. By comparing the two sets of figures an indicated change for each type of benefit is obtained. Since the percentages of the total cost for each type of injury may be different in each state it is necessary to distribute the effect of the change in proportion to the percentage of the total that can be attributed to that type of injury. This is shown in Table 14.

The examples of the calculation which have been chosen are for a state whose benefit provisions are unusually easy to evaluate. The general procedure is the same for all states, but departures and special calculations must be made to fit the particular set of benefit provisions under consideration. In addition it may be noted that there are certain types of benefits which are not considered, as for example, temporary partial. It is necessary to analyze separately those provisions which do not lend themselves to the standard procedure and determine, very often on the basis of judgment, the probable cost of such benefits.

TABLE 7—EFFECT OF LIMITS

(1) Weekly Wage (Assumed)	(2) No. of Cases (Assumed)	(3) Total Weekly Wages (1) × (2)	(4) Amount Payable if 50% Was Paid in All Cases (3) × .50	(5) (6) Effect of Minimum		(7) Amount Actually Paid at 50%	(8) (9) Effect of Maximum		(10) Total Amount Actually Payable (6) + (7) + (9)	(11) Effect of Limits. Limit Factor Ratio of Amount with Limits to Amount Without Limits (10) ÷ (4)
				(5) Number of Cases Affected	(6) Amount (5) × \$5		(8) No. of Cases Affected	(9) Amount (8) × \$21		
\$4	2	\$8	\$4	2	\$10	..	..	..	\$10	..
6	4	24	12	4	20	..	..	..	20	..
8	6	48	24	6	30	..	..	..	30	..
10	10	100	50	..	..	\$50	..	..	50	..
16	20	320	160	..	..	160	..	..	160	..
21	40	840	420	..	..	420	..	..	420	..
26	40	1,040	520	..	..	520	..	..	520	..
32	30	960	480	..	..	480	..	..	480	..
42	20	840	420	..	..	420	..	..	420	..
48	12	576	288	..	..	..	12	\$252	252	..
54	10	540	270	..	..	..	10	210	210	..
60	6	360	180	..	..	..	6	126	126	..
	200	5,656	2,828	..	..	..	..	..	2,698	.9540
	Average	\$28.28	\$14.14	..	..	..	..	..	\$13.49	..

TABLE 8

ANALYSIS OF THE BENEFIT PROVISIONS OF A COMPENSATION ACT

1. Fatal:

Burial expenses—\$200.

To those wholly dependent:

50% of the employee's average weekly wages subject to a minimum of \$5 and maximum of \$21 weekly, continuing for a maximum period of 312 weeks.

Benefits do not cease upon the death of a dependent but are paid to other dependents, if any.

Benefits cease upon remarriage of a widow unless there are other dependents.

Benefits to children cease when they attain 18 years of age unless incapacitated.

2. Permanent Total Disability:

50% of the average weekly wages subject to a minimum of \$5 and a maximum of \$21 weekly continuing during total incapacity but not longer than 520 weeks.

3 and 4. Permanent Partial Incapacity—Major and Minor permanent partial:

In addition to compensation for the period of total disability 50% of the average weekly wages subject to a minimum of \$5 and a maximum of \$21 weekly for certain specified periods for specified injuries. (See valuation sheets.)

5. Temporary Total Disability:

50% of the average weekly wages subject to a minimum of \$5 and a maximum of \$21 for the period of disability but not longer than 520 weeks. Waiting period 7 days retroactive to date of injury at 28 days.

6. Medical Benefits:

Such reasonable medical and hospital care as is necessary.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)				
Class of Injury	No. of Cases	Person Receiving Compensation	No. of Dependents	Assumed Average Age	Period for Which Compensation is Payable	Annuity Symbol	Annuity Value (1 per year) for Period in (6)	Annuity Value (1 per week) for Period in (6) or 52 x (8)	Total Cost of Cases in (2) At 100% of Weeks Wages (9) x (2)	Total Cost at Specified Percent of Wages in This Case 50% (10) x .50				
I Fatal a Dependency	762													
	174	None	None	XXX		1								
	177	Widow alone	1	47	312 weeks	1 _a \bar{s} _a $\overline{72}$	5.1444	267.51	47,349					
Sum of cases of multiple dependency a + b + c + d = 325	79	Widow with child	1	36		1 _a \bar{s} _a $\overline{72}$		281.8127	91,589					
Inasmuch as the difference between a a joint life contingency and an annuity certain for a limited term is not appreciable, for the purpose of simplicity a simple annuity certain is used.	68	Widow with children	1	36		"								
	47	Widow with children	2	8		"								
	28	Widow with children	1	36		"								
	17	Widow with children	3	8		"								
	14	Widow with children (More than 5)	1	36		"								
	13	Orphan	4	8		"								
	6	Orphans	1	8	312	1 _a \bar{s} _a $\overline{72}$	5.3831	279.92	3,639					
	3	Orphans	2	8		"								
	2	Orphans (More than 4)	3	8		"								
	2	Orphans	4	8		"								
	2	Widow and parent	6*	8		"								
	2	Widow and children	1	47		"								
	2	Other dependent	1	61		"								
	66	Parent	1	36		"								
* Average (assumed)	35	Parents	2	61	312	1 _a \bar{s} _a $\overline{72}$	4.9111	255.38	16,855					
	7	Brother or Sister	1	11		1 _a \bar{s} _a $\overline{11}$	5.3850	280.02	1,960					
	2	Brothers or Sisters	2	11		"								
	1	Brothers or Sisters	4*	11		"								
	5	Parent	1	50		"								
	3	Brother or Sister	1	11		"								
	2	Parent	1	50		"								
	4	Brothers or Sisters	2	11		"								
	2	Parent	1	50		"								
	4	Brothers or Sisters	4*	11		"								
	3	Other Dependents	2	50		"								
	3	Other Dependents	3*	11		"								
b. Burial	762				\$200									
	14	Injured (No dependents)		42	520	1 ₁₀ \bar{s} _a	8.0204	417.06	25,858	\$152,400				
2 Perm. Total	48	Injured (With dependents)		42	520	1 ₁₀ \bar{s} _a				19,929 weekswages				

Danish Female Survivorship and Dutch Remarriage All commutation tables at 3 1/2%

U. S. Life Tables

Total 161,392

80,696 weekswages

TABLE 9

EXPLANATION

FORM C 1 AND 2 FATAL AND PERMANENT TOTAL DISABILITY

- Column (1)—Subdivisions for the type of injury.
- Column (2)—Number of subtotals of cases.
- Column (3)—Description of dependents.
- Column (4)—Number of dependents in each subgroup.
- Column (5)—Assumed average age of dependents.
- Column (6)—Gives additional information—derived from the analysis of the benefit provisions (see exhibit). In this particular instance 312 weeks is specified.
- Column (7)—In order to make the estimates on a present value basis appropriate annuity values must be employed. In this case either an annuity certain for 312 weeks or a temporary life annuity for 6 years (52 weeks \times 6 = 312 weeks) is employed in the case of single dependents. The interest rate in all cases is $3\frac{1}{2}\%$ and the mortality is that of the United States Life Tables except in the case of the widow (aged 47) where the tables are the combined Danish Female—Survivorship and Dutch Remarriage.
- Column (8)—Shows the tabular values for the annuity symbols in Column (7).
- Column (9)—Shows all values in weeks units. Usually Column (8) multiplied by 52. This really is the cost in weeks wages for each case in Column (2) and (3).
- Column (10)—Shows the total cost for the number of cases in the group. For convenience one multiplication has been made for the 325 cases using an annuity certain.
- Column (11)—Shows the total cost in weeks wages at the specified percentage allowed by law. The monetary amount payable for burial is merely the number of fatal cases extended at \$200, the funeral allowance.

(1) (2) (3) (4) (5) (6) (7) (8) (9)

	Class of Injury	Type of Disability	How Valued	No. of Cases	Duration of Payments	Com-muted Duration (See* Table)	Cost at 100% Compensation (4) x (6) or (5)	Nominal Percentage of Compensation	Cost at Nominal Percentage of Compensation (7) x (8)						
	3. Maj. Perm.	(a) Dismemb.	(Specific Schedule)												
			Arm	61	225	208.99	12,748								
			Hand	86	175	165.19	14,206								
			Leg	62	208	194.26	12,044								
			Foot	43	156	148.17	6,371								
			Eye	290	156	148.17	42,969								
			Hearing Both Ears	1	156	148.17	148								
					(Total of 3 (a))	543	XXXX		88,486	50	44,243				
				(b) Perm. Partial (Loss of Use)	90% of Major Dismemberment	381		146.66	55,877	50	27,939				
				(c) Perm. Total (all other)	If Law provides for such.										
		(d) Temp. Total	20 Weeks Duration per Maj. Perm. Case (Specific Schedule)	924	20	XXXX	18,480	50	9,240						
	4. Min. Perm.	(a) Dismemb.	(Specific Schedule)												
			Thumb	96	60	58.81	5,646								
			1 phal. Thumb	152	30		4,560								
			1st Finger	301	38		11,438								
			1 phal. 1st Finger	261	12½		3,306								
			2nd Finger	147	30		4,410								
			1 phal. 2nd Finger	172	10		1,720								
			3rd Finger	104	25		2,600								
			1 phal. 3rd Finger	89	8½		742								
			4th Finger	119	20		2,380								
			1 phal. 4th Finger	65	6½		433								
			Thumb or Finger & Loss or injury other Fingers	532	86½	84.04	44,709								
			Great Toe	37	38		1,406								
			1 phal. Great Toe	16	19		304								
			1 other Toe	19	13		247								
			1 phal. other Toe	11	6½		72								
			1 Toe and loss or injury other Toes	35	45		1,575								
			Hearing (1 Ear)	5	52	51.10	256								
			(Total of 4 (a))	2161	XXXX		85,804	50	42,902						
		(b) Perm. Partial (Loss of Use)	90% Aver. Minor Dismemberment	703		35.74	25,125	50	12,563						
		(c) Perm. Partial (all other)	If Law provides for such.												
		(d) Temp. Total	5 Weeks Duration per Minor Perm. Case	2864	5	XXXX	14,320	50	7,160						
	5. Temp. Total	(a) Temp. Total	See T. T. Table	XXX	XXXX	XXXX	181,154	50	90,577						

A STATISTICAL ANALYSIS

Notes:—Lines 3 (b) and 4 (b) refer to cases "related to Dismemberment".

Col. 3—line 3 (d) Formula is: 20—waiting period in weeks But ignore retroactive waiting period.

Col. 3—line 4 (d) Formula is: 5—waiting period in weeks But ignore retroactive waiting period.

Col. 4—line 3 (d) (Total of 3 (a) + 3 (b) + 3 (c))

—line 4 (d) (Total of 4 (a) + 4 (b) + 4 (c))

*Do not commute duration of less than 52 weeks.

TABLE 10

EXPLANATION

FORM C 3, 4 AND 5, MAJOR, MINOR AND TEMPORARY TOTAL

Columns (5) and (8) are based on the benefits allowed in the law.

Column (6) is the present value of the weekly annuities (at 3½%) for those durations which exceed 52 weeks or a year.

Subdivisions (b) for major and minor are based upon 90% of the average cost of a case in (a).

Subdivisions (d) for major and minor are based upon auxiliary data showing the average healing period or period of temporary total disability to be 20 weeks for a major and 5 weeks for a minor case.

Temporary Total—This value is based upon commutation columns constructed on the basis of the durations of disability lasting one day or more, two days or more, etc., as shown in the American Accident Table. By the use of these tables it is possible to compute the number of weeks of compensation that must be paid for the appropriate waiting period and retroactive feature.

TABLE 11

SUMMARY OF VALUATION AND TRANSLATION INTO MONETARY COST

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Class of Injury	Kind of Benefit	Benefits in Week's Wages (Without Limits)	% Comp. Rate	Limits on Weekly Compensation		.....Aver. Wage \$20.53		
				Lower (a)	Upper (b)	Limit Factor	Week's Wages with Limits (3) x (6)	Monetary Cost: Sub-Totals of (7) x Average Wage
Fatal	(a) Dependency	80,698	50	\$5	\$21	1.0019	80,849	\$1,659,837
	(b) Burial	XXXX	XX	XX	XX	XXXX	XXXXXXXXXX	152,400
	(c) Pay'ts to State	XXXX	XX	XX	XX	XXXX	XXXXXXXXXX	
	(d)							
Perm. Total	(a)	12,929	50	5	21	Sub-Total 1.0019	XXXXXXXXXX 12,954	1,812,230
	(b)							
Maj. Perm.	(a) Dismemb. Perm. Part.	44,243	50	5	21	Sub-Total 1.0019	12,954 44,327	265,946
	(b) (Loss of Use) Perm. Part.	27,939	50	5	21	1.0019	27,992	
	(c) (all other)							
	(d) Temp. Total	9,240	50	5	21	1.0019	9,258	
Min. Perm.	(a) Dismemb. Perm. Part.	42,902	50	5	21	Sub-Total 1.0019	81,577 42,983	1,674,770
	(b) (Loss of Use) Perm. Part.	12,563	50	5	21	1.0019	12,587	
	(c) (all other)							
	(d) Temp. Total	7,160	50	5	21	1.0019	7,174	
Temp. Total	(a)	90,577	50	5	21	Sub-Total 1.0019	62,744 90,749	1,288,134
						Sub-Total	90,749	1,863,077

Notes:—Col. (3) from respective "Valuation" Sheets.
 Col. (6), (10), (14)—From "Limit Factor" Sheet for State.
 Lines 3 (b) and 4 (b) Refer to cases "related to dismemberment".

TABLE 12
 CALCULATION OF VALUES FOR THE TABLE OF RELATIVE COSTS
 AND EQUIVALENT DURATIONS

Kind of Benefit	(1) No. of Cases	(2) Average Weekly Wage	(3) Total Monetary Cost	(4) Average Cost (3) ÷ (1)	(5) Average Duration (4) ÷ (2)
Fatal	762	\$20.53	\$1,812,230	\$2,378	116
Permanent Total	62		265,946	4,289	209
Permanent Partial Major.	924		1,674,776	1,813	88
Permanent Partial Minor.	2,864		1,288,134	450	22
Temporary Total	95,388		1,863,077	19.53	1.0
All Benefits	100,000		6,904,163	69	3.4

TABLE 13
DETERMINATION OF THE EFFECT OF A CHANGE IN BENEFITS —
BY TYPE OF BENEFIT

Kind of Benefit	(1) Total Monetary Cost of Pres- ent Benefits	(2) Total Monetary Cost of Pro- posed Benefits (Assumed)	(3) Ratio of Cost of Proposed Benefits to Present Benefits (2) ÷ (1)
Fatal	\$1,812,230	\$2,361,839	1.303
Permanent Total	265,946	327,911	1.234
Permanent Partial Major.	1,674,776	1,879,099	1.122
Permanent Partial Minor.	1,288,134	1,418,235	1.101
Temporary Total	1,863,077	2,299,037	1.234

TABLE 14
DETERMINATION OF THE AVERAGE OVERALL EFFECT OF A
CHANGE IN BENEFITS

Kind of Benefit	(1) Effect of Change	(2) Percentage of Total Costs Previously Incurred for Each Type of Benefit (Used as Weights)	(3) Weighted Effect (1) × (2)
Fatal	1.303	10.1	13.2
Permanent Partial	1.234	2.2	2.7
Permanent Partial Major.	1.122	9.7	10.9
Permanent Partial Minor.	1.101	11.1	12.2
Temporary Total	1.234	22.3	27.5
Medical	1.000	44.6	44.6
All Benefits		100.0	111.1

Or an Indicated Increase of 11.1% (111.1 — 100.0)

PART III

Some Statistical Comparisons of Actual Results and Theoretical Estimates

It is desirable to have the validity of any theoretical computation borne out by actual results. Unfortunately it is almost impossible to obtain figures which can be said to be comparable in every sense and which can therefore be used as a verification of the theoretical procedure.

Some of the causes have been explained previously. At the expense of repetition, these are:

1. The differences in accident frequency and dependency distribution.
2. The differences in administrative policies.
3. The differences in wage scales.
4. The differences in predominating types of industries and, consequently, in typical injuries.
5. The inadequacy of statistical data.

Even though it is extremely difficult to prove by rigid means the accuracy of the procedure that has been followed in determining the estimated effect of benefit changes, the same procedure has been in effect for a great many years. This is due to the fact that it has been more or less standardized and carefully and painstakingly developed. Its practical advantages are that it is simple to follow and can be used to give an estimate in a reasonable space of time, a factor of great importance when legislation is under consideration. In addition, the method of application is such as to take the utmost advantage of compensating errors. As far as possible the same assumptions are made, and the same auxiliary tables employed in determining the theoretical cost of the benefits both before and after changes, with the result that, when the indicated change is obtained in the form of a ratio of one cost to the other, errors due to assumptions or approximations, since they occur in both the numerator and denominator of the ratio, are, to a very large extent, cancelled. Hence both from the practical and theoretical viewpoint, the procedure is eminently satisfactory and may be expected to give reasonably correct results. In any case, it would be no easy task to find a substitute procedure that would have a higher degree of justification.

Despite the difficulties previously noted, it was thought that some indication of the accuracy of the procedure could be obtained by comparing for a number of states, over a period of years, the actual results with the theoretical estimates. This cannot be done for all types of injury, but data are available for fatal, permanent total and major permanent partial disability cases. Ten of the major industrial states, for which such reports were available, were chosen, and average costs per case calcu-

lated on both the theoretical and actual bases. The states having the larger volume of data were picked because it was felt that, the greater the number of cases, the more reliable would be the indications. Although an appreciable number of cases was available for both the fatal and major permanent partial group, the number in the permanent total group was rather small.

In making the calculations a possible discrepancy may be caused by the distribution of cases receiving compensation under different benefit provisions, when in a particular state an amendment became effective. For the theoretical values it is assumed that there is an even distribution of accidents occurring throughout the year. In actuality, this may not be true, either as a result of seasonal industrial activity or because of the method of reporting the data. Nevertheless it was felt reasonable to assume, that over a long period of time, for any particular state, the average cost of a case will reflect the changes in the benefit provisions and that therefore the degree of change on the actual basis will bear a close relationship to the degree of change indicated on the basis of the theoretical estimates. If this condition were found to exist, it would be an indication that changes indicated on the theoretical basis can be expected to be realized in actuality. It is not necessary that the actual values should be in absolute agreement with the theoretical, it being sufficient that the amount of change is approximately the same. The necessary requirements are met if an indicated increase of 10% in the theoretical values, which may or may not be close to the actual, results in an increase of 10% in the actual values. Graphically, this would be indicated if the curve for the theoretical estimates parallels that of the actual values.

The data for the ten states were combined and Tables 15 and 16 prepared which compare both the actual averages and the theoretical estimates. The data are also portrayed in Graphs III and IV. It was thought that in a test of this nature, the unweighted averages were of equal value with the weighted, so that both sets were calculated. The weighting process consisted in applying the number of cases occurring in each state to the theoretical averages for the state and then summing. The actual weighted averages were obtained by dividing the total cost by the total number of cases.

As will be seen by examining the graphs, the results are not materially different whether the weighted or unweighted averages are used. The curves, although not exactly parallel, are nevertheless in close agreement except for the permanent total group, which had too small a number of cases to be as indicative as the others. The major disability group, which is in general the least complicated of the benefit provisions and the simplest to evaluate, indicates that the theoretical averages are almost consistently too low, although the same approximate rates of change are indicated.

The data would seem to bear out the assumption that the indicated change in the cost of a case, computed by means of the theoretical procedure, is closely borne out by the changes in the actual values. Even the average costs are not far apart, those for fatal being usually very close together. It is of interest to note that the widest divergence occurs in the more recent years, when there was the smallest number of changes in the benefit provisions. This may possibly be explained by the fact that, in many states, the average weekly wage, either by administrative ruling, or provision in the compensation act, is based on the average of the preceding year or on the basis of full time employment. This may account for the actual averages in the last few years being somewhat higher than the theoretical estimates.

In summarizing, it would seem that, providing adequate data regarding average weekly wages and wage distributions are available, and a large number of cases are involved, changes in cost because of benefit amendments are predictable with reasonable accuracy by means of the theoretical procedure.

ACKNOWLEDGMENTS

This paper would not be complete without due acknowledgments to the writers of the papers appearing in previous *Proceedings* of the Society and in particular to Miss Outwater, and Messrs. Mowbray, Greene and Dorweiler, upon whose previous work and tables much of this paper is based. Practically all of the statistical data used in the exhibits were obtained from the National Council on Compensation Insurance. Almost all of the procedure for determining the theoretical cost of the benefit provisions of a compensation act was developed by the present and former members of the staff of this organization.

TABLE 15
EXHIBIT OF ESTIMATED THEORETICAL AVERAGES AND ACTUAL INCURRED AVERAGES
WEIGHTED ARITHMETIC AVERAGE FOR TEN STATES*

Year	Fatal			Permanent Total			Major			All Serious		
	No. of Cases	Est. Ave.	Act. Ave.	No. of Cases	Est. Ave.	Act. Ave.	No. of Cases	Est. Ave.	Act. Ave.	No. of Cases	Est. Ave.	Act. Ave.
1932.....	1,904	\$3,804	\$4,028	147	\$7,547	\$7,615	3,271	\$2,301	\$2,510	5,322	\$2,984	\$3,194
1931.....	2,357	4,213	4,268	219	9,049	8,499	4,028	2,526	2,804	6,604	3,345	3,515
1930.....	2,939	4,341	4,426	250	9,343	9,590	4,971	2,606	2,864	8,160	3,437	3,653
1929.....	3,418	4,344	4,428	297	9,417	9,515	6,120	2,649	2,937	9,835	3,442	3,654
1928.....	3,275	4,307	4,498	329	9,091	9,438	5,949	2,644	2,881	9,553	3,436	3,661
1927.....	3,224	4,338	4,313	308	9,061	8,047	5,403	2,609	2,826	8,935	3,455	3,543
1926.....	3,236	4,266	4,286	305	8,382	7,946	5,530	2,496	2,672	9,071	3,326	3,425
1925.....	3,096	4,184	4,177	287	8,474	8,384	5,203	2,490	2,635	8,583	3,301	3,383
1924.....	2,841	4,104	4,100	271	8,924	8,396	4,647	2,478	2,574	7,759	3,299	3,336
1923.....	3,014	4,014	3,983	250	8,527	7,831	4,969	2,363	2,510	8,233	3,154	3,211
1922.....	2,575	3,637	3,578	269	7,338	7,363	4,579	2,182	2,298	7,423	2,873	2,926
1921.....	2,187	3,557	3,421	220	7,253	7,556	3,656	2,168	2,271	6,063	2,853	2,877
1920.....	2,124	3,498	3,462	245	7,423	7,536	3,900	2,162	2,246	6,269	2,821	2,865
1919.....	2,245	3,204	3,145	329	6,140	6,089	4,386	2,058	2,079	6,980	2,621	2,612
1918.....	2,242	2,925	2,919	335	6,424	6,013	3,930	1,908	1,832	6,507	2,491	2,422
All Years....	40,677	3,975	3,998	4,061	8,152	7,968	70,545	2,404	2,565	115,283	3,161	3,261

*Policy Year Data for the Following States:

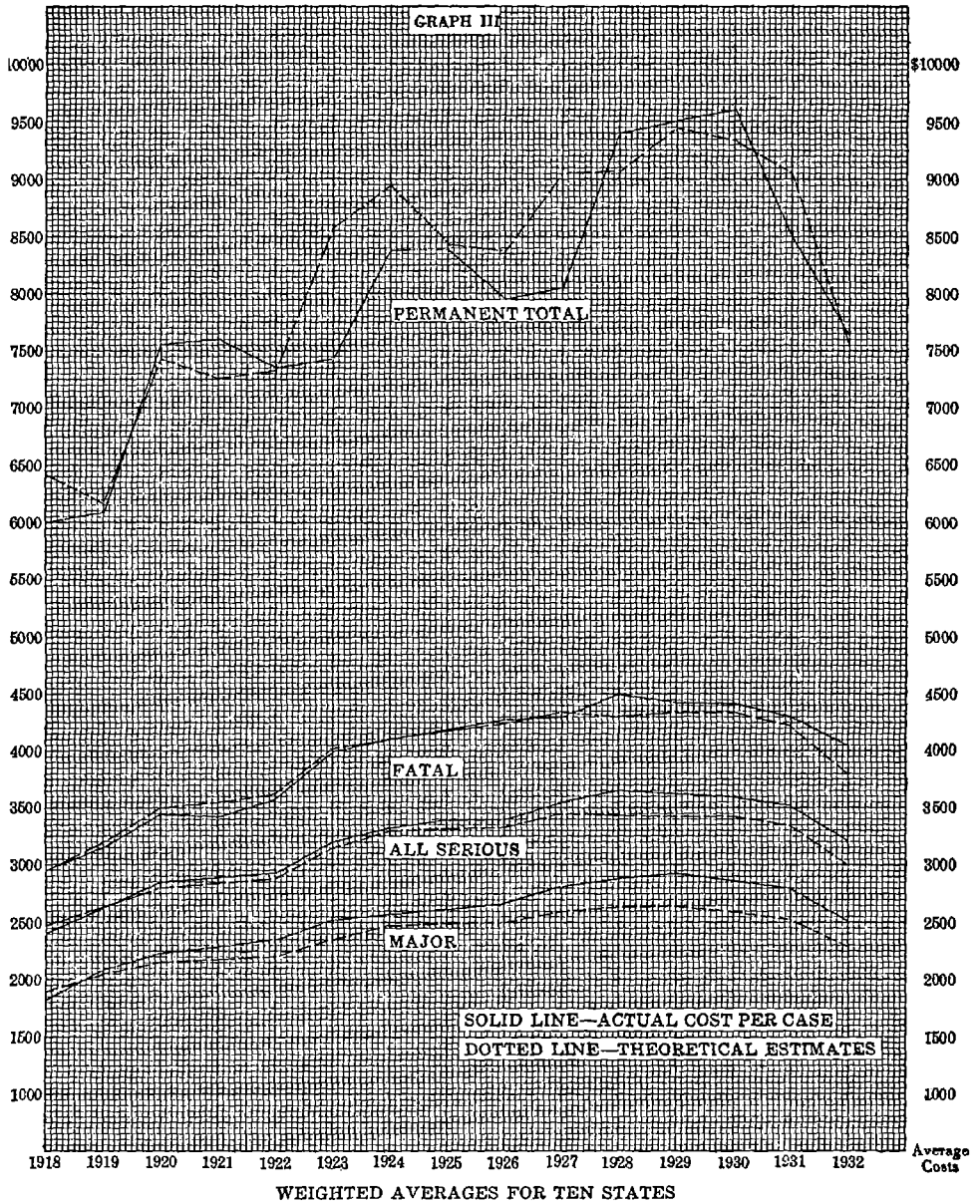
California	Massachusetts	New Jersey
Illinois	Michigan	New York
Indiana	Minnesota	Texas
		Wisconsin

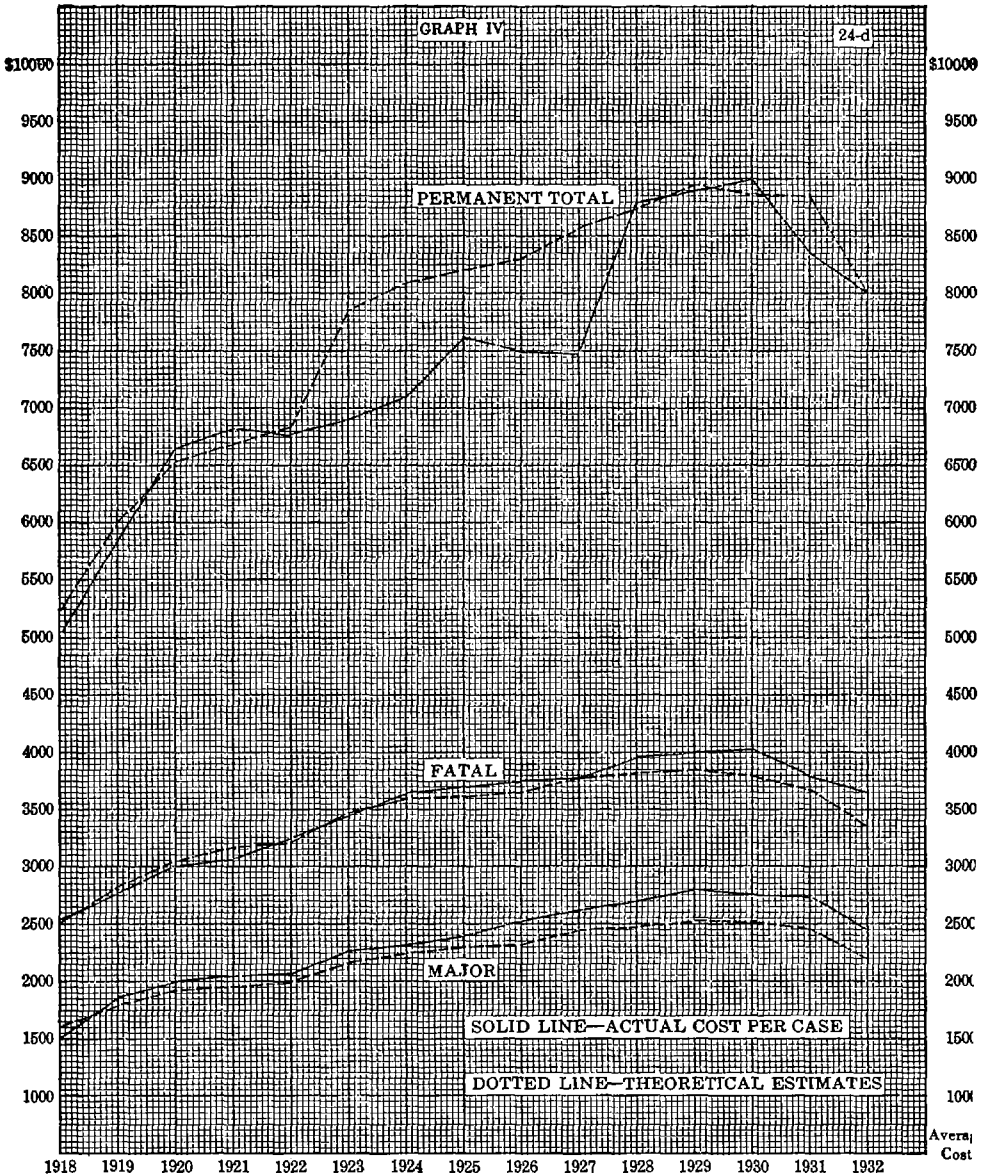
TABLE 16
EXHIBIT OF ESTIMATED THEORETICAL AVERAGES AND ACTUAL INCURRED AVERAGES
UNWEIGHTED ARITHMETIC AVERAGE FOR TEN STATES*

Year	Fatal			Permanent Total			Major		
	No. of Cases	Esti- mated Average	Actual Average	No. of Cases	Esti- mated Average	Actual Average	No. of Cases	Esti- mated Average	Actual Average
1932.....	1,904	\$3,363	\$3,663	147	\$7,979	\$8,019	3,271	\$2,182	\$2,480
1931.....	2,357	3,694	3,802	219	8,841	8,352	4,028	2,465	2,770
1930.....	2,939	3,821	4,022	250	8,894	8,968	4,971	2,509	2,743
1929.....	3,418	3,849	3,995	297	8,920	8,887	6,120	2,523	2,788
1928.....	3,275	3,832	3,954	329	8,788	8,788	5,949	2,484	2,705
1927.....	3,224	3,807	3,780	308	8,585	7,492	5,403	2,441	2,637
1926.....	3,236	3,664	3,740	305	8,276	7,482	5,530	2,348	2,532
1925.....	3,096	3,637	3,669	287	8,218	7,622	5,203	2,323	2,444
1924.....	2,841	3,588	3,632	271	8,112	7,143	4,647	2,286	2,341
1923.....	3,014	3,490	3,464	250	7,871	6,903	4,969	2,206	2,329
1922.....	2,575	3,237	3,232	269	6,845	6,809	4,579	2,045	2,090
1921.....	2,187	3,153	3,089	220	6,673	6,826	3,659	2,017	2,080
1920.....	2,124	3,056	3,025	245	6,547	6,668	3,900	1,972	2,023
1919.....	2,245	2,819	2,787	329	6,028	5,848	4,386	1,849	1,887
1918.....	2,242	2,536	2,569	335	5,172	5,068	3,930	1,607	1,543
All Years.....	40,677	3,436	3,495	4,061	7,716	7,392	70,545	2,217	2,360

*Policy Year Data for the Following States:

California	Massachusetts	New Jersey
Illinois	Michigan	New York
Indiana	Minnesota	Texas
		Wisconsin





UNWEIGHTED ARITHMETIC AVERAGES FOR TEN STATES

RECENT DEVELOPMENTS IN COMMERCIAL ACCIDENT
AND HEALTH INSURANCE

BY

WARD VAN BUREN HART

A. *Accident Insurance*

THE BACKGROUND

In the early years of the 20th century, a typical Accident policy was likely to provide:

1. Accidental death coverage of \$1,000.
2. Dismemberment coverage varying from \$1,000 for loss of two limbs to \$250 for loss of thumb and finger.
3. \$5.00 per week for total disability not to exceed one or two years duration.
4. \$2.50 per week for partial disability not to exceed 10 weeks.
5. Rather limited benefits for hospital confinement and specified surgical operations.
6. The premium for this coverage was usually \$5.00 in the non-hazardous occupations.

By the time of the historic year 1929, a typical Accident policy provided:

1. Accidental death coverage of \$1,500.
2. Dismemberment coverage varying from \$1,500 to \$375.
3. \$5.00 per week for total disability, even for life, with disability often defined as inability to perform the duties of *his* occupation.
4. \$2.50 per week for partial disability not to exceed 26 weeks.
5. Provision for doubling the above benefits if the accident occurred on a public conveyance or for certain other specified causes.
6. Certain benefits for hospital confinement and surgical operations.
7. The premium charged for this coverage in the non-hazardous occupations was still \$5.00.

In addition, some companies were offering additional benefits such as triple or quadruple indemnity for special types of accidents, partial disability with a 52 week limit, and liberal special benefits for automobile accidents, sometimes applying to the occu-

pants of the automobile, sometimes to pedestrians, and sometimes to both. Sometimes an adequate extra premium was charged for these additional benefits, but more often not.

THE STATUS TODAY

The corresponding form of Accident policy issued in 1935 provides:

1. Accidental death coverage of \$1,000.
2. Dismemberment coverage varying from \$1,000 to \$250.
3. \$5.00 per week for total disability with the further provision that during the first 52 weeks, indemnity shall be paid for inability of the insured to perform the duties of *his* occupation, but for disability beyond 52 weeks indemnity shall be paid only for inability to perform the duties of *any* occupation.
4. \$2.00 per week for partial disability not to exceed 26 weeks.
5. Provision for doubling the above benefits if the accident occurred on a public conveyance or from certain other specified causes.
6. Certain benefits for hospital confinement and surgical operations.
7. The premium charged in the non-hazardous occupations is \$5.00. However, certain occupations which were formerly considered relatively non-hazardous, such as real estate agents and traveling salesmen have been placed in a class where the premium is \$6.00. Moreover, an additional charge is made today for death coverage with the higher attained ages, usually above age 60.

The reasons for this history of liberalization of benefits followed by restriction of benefits and premium increases are various. Among them may be mentioned:

1. *The type of carrier handling Commercial Accident and Health business.*

This kind of business has been sold in the U. S.—

- a. As a sideline to life insurance by life companies not conducting a general Casualty business.
- b. As a sideline to other kinds of insurance by Casualty companies conducting Workmen's Compensation Insurance, Burglary Insurance, Liability Insurance, etc., but not life insurance.

- c. By multiple line companies doing all forms of insurance business.

In very few instances has Accident and Health Insurance been one of the primary lines handled by a company, but all too often it has been a sideline used as a feeder for other forms of insurance with a consequent temptation to ignore rate inadequacies, and to be over-influenced by competitive considerations. Unlike Casualty insurance, where pooled statistics are handled by Bureaus with mandatory power, and unlike Life insurance where most fairly good-sized companies have reasonably good statistics available, scientific actuarial treatment in the Accident and Health field was for many years conspicuous by its absence in all but a few large companies.

The conditions just outlined above brought about a constant tendency for many years toward inadequate rates and over-liberal coverage, with no effective machinery for securing a co-ordinated program.

2. *The increasing importance of the automobile.*

The "Prosperity" policy described as prevalent in 1929 had become fairly common as early as 1915, and undoubtedly for quite a few years following 1915, produced modest profits to the companies, but beginning about 1922, the automobile accident loss ratio has risen steadily, until today the automobile accounts for over 30% of all accidents instead of a negligible proportion as was the case 15 years ago.

Despite the great improvement in the industrial "general" accident frequency, the accident loss ratio in the "white collar" class for accidents other than automobile accidents has remained relatively unchanged, so that there has been no offsetting factor.

3. *In certain casualty companies, the tendency to rely on investment profits to offset underwriting losses.*

The attitude of companies which found investment profits rolling in during the boom years was obviously not one to encourage careful underwriting or an impartial attitude toward scientific rate determination.

Not long after 1929, however, conditions were radically different. The entire attention of the company executives was focused on eliminating all possibility of underwriting losses. Investment profits had disappeared or had been transformed into losses, sometimes of disheartening proportions. The automobile hazard continued to account for a large share of claims, and the malinger-

ing, conscious or unconscious, which always appears in times of unemployment, immediately began to materialize.

The Accident and Health companies turned to the Bureau of Personal Accident and Health Underwriters in order to formulate some program which would put the business on a sounder basis. This Bureau, organized in December, 1914, had done valuable work in keeping in touch with proposed legislation, in sponsoring a standardized Occupation Manual, and in acting as a general clearing house for discussion and planning. A few of the restrictions and rate increases just mentioned had been put into effect as early as 1929, but in 1931 it was decided that the Bureau should go further. The insuring clause of the Accident policy was standardized, and the Bureau drafted some typical policies and had them submitted for approval by the various Insurance Departments in the name of one company. It was suggested that the language of these advisory policies be used by all companies. In addition, the following important provisions were made mandatory on all Bureau Members:

1. The policy must cover only accidental injuries arising from accidental *means*.
2. Benefits for total disability could be paid for fifty-two weeks for inability of the insured to perform the duties of *his* occupation, but for disability beyond fifty-two weeks, benefits could be paid only for inability to perform the duties of *any* occupation.
3. Benefits for partial disability must be limited to 26 weeks and to 2/5 of the weekly indemnity payable for total disability.

Rates for the present policy forms were fixed by the Statistical Committee of the Bureau. Any special policy proposed by a company had to be submitted to this committee and to the Underwriting Committee of the Bureau for approval of the language and adequacy of the rates. Any company is at liberty to use higher rates or less liberal benefits than those sponsored by the Bureau.

INTRODUCTION OF MEDICAL REIMBURSEMENT CLAUSE

In 1930 and 1931 several companies issued policies in which the specific hospital, medical, surgical and nursing benefits previously included were replaced by a provision that the company

would reimburse the insured for the amount actually expended by him for such services, not to exceed some specified limit. The limit was usually fixed at twenty times the weekly indemnity or 10% of the principal sum, and the minimum limit in all cases has been \$500. However, a policy of this type has also been issued in a form containing no principal sum (i.e., death benefit) or weekly indemnity, but merely dismemberment benefits and certain benefits for specified injuries. There had been a feeling for several years that the standard form of Accident policy described earlier was not meeting to the fullest extent the needs of the public. Many of the purchasers of Accident policies are in salaried positions and their salaries are continued by their employers during disability. The agent was forced to make the statement that the weekly indemnity benefits could be used by the insured to defray various types of medical expense incurred by him which would probably not be covered in most cases by the rather limited surgical, hospital or medical benefits of the older type of policy. By introducing a policy providing for direct reimbursement for these expenses, the companies have brought it about on certain policy forms that the surgical, hospital, medical and nursing benefits, instead of being a rather trivial part of the policy, have become a major benefit. So far as this clause is concerned, the problems of these newer policies become those of *indemnity* rather than those of *insurance*.

Most of the claim cost for such a benefit comes from relatively small claims, so that units beyond the initial unit can be granted at a lower rate. For instance, when originally brought out, a policy with \$5,000 principal sum, \$25.00 weekly indemnity and \$500 reimbursement limit was issued in the non-hazardous occupations for a premium of \$30.00, while a policy with \$10,000 principal sum, \$50.00 weekly indemnity and \$1,000 reimbursement limit was issued for a premium of \$55.00. In 1933 these rates were increased somewhat. As no actual experience was available in 1930 and 1931, the rates for the first few years to be charged for this reimbursement benefit had to be based largely on judgment. Recently some experience has become available and in a few years more it should be possible to check up the rates with a considerable degree of accuracy.

RATE SET-UP TODAY

Typical gross rates for men in Class A (the most favorable occupations) are now made up as follows:

	With Older Forms of Surgical, Hospital, etc.	With Newer Reimbursement Benefit* — 1st \$5,000	Additional Units
Death \$1,000	\$1.75	\$1.75	\$1.75
Dismemberment .....	.10	.10	.10
Total Disability \$5.....	1.67	1.67	1.67
Partial Disability \$2..	.66	.66	.66
Double Indemnity ....	.50	.50	.50
Surgical, etc. ....	.32	..	..
Reimbursement .....	..	2.32	1.02
TOTAL	\$5.00	\$7.00	\$5.70

*Minimum policy \$5,000.

Note: Although the reimbursement policies are issued only with a minimum reimbursement limit, they have been shown in the above table on a basis of \$1,000 principal sum with \$5.00 weekly indemnity for the sake of comparison.

In promulgating these rates, the Statistical Committee of the Bureau collected from the member companies such experience as was available. The composite expenses of the companies were studied with a view toward fixing the amount of loading to be used, and arrangements were made to have the Bureau assemble annually the combined experience of the member companies by means of Hollerith cards beginning with the policy year 1931.

Certain principles in connection with the calculation of rates have been standardized. Among these are:

1. *Treatment of Unlevel Insurance.*

An Accident policy providing \$1,000 of principal sum and \$5.00 of weekly indemnity is customarily known as level insurance, and any policy departing from this ratio is known as unlevel. It has generally been felt that there is a selection against the company in the case of unlevel insurance, although this has not been conclusively demonstrated by statistics. The rule has been adopted that a policy providing for principal sum only, or a policy providing for weekly indemnity only, shall carry a rate increased 10% over rates such as are shown in the above table, and corresponding adjustments are made for excess death or weekly indemnity in the case of unlevel policies.

2. *Accident Insurance Issued to Women.*

Prior to 1932 some companies had issued Accident insurance to women at a classification one degree higher than to men; others had made no distinction. Today standard basic rates for women are adopted which are lower than those for men in the case of death benefits and higher for weekly indemnity benefits. For a level policy the results are usually about equivalent to the old rule of using one classification higher than for men.

3. *Classification for Occupation.*

At present occupations are classified under the headings "A", "B", etc., "A" representing the most favorable occupations. An elaboration is now in effect distinguishing between the principal sum and the weekly indemnity as far as the effect of occupation is concerned. This is necessary because the effect of occupation is two-fold; in the case of the death benefit only the amount of actual hazard involved needs to be considered, whereas in the case of the weekly indemnity the consideration of the possibility of a trivial accident producing a long continued disability has to be taken into account. For the four classifications in which the bulk of Commercial Accident Insurance is written, the relationship between the rates charged is now as follows:

	Death	Weekly Indemnity
A	100%	100%
B	112½%	125%
C	125%	150%
D	140%	190%

The correct classification of occupations demands a careful study of all statistics available plus careful and discriminating judgment. In general, Class A includes those engaged in office or executive duties, Class B those whose duties require them to be outside or on the road for a considerable portion of their time, but do not involve any hazard beyond that of ordinary travel, while Class C and Class D introduce progressively some element of provision for the longer weekly indemnity claims inherent in occupations where personal performance of work replaces or outweighs supervisory duties. Class E and higher classes embrace those occupations where the danger of accident, either non-fatal or fatal, becomes a factor of real importance.

B. Health Insurance

The evils of unwise and unrestricted competition appeared considerably earlier in the case of Health Insurance than in the case of Accident Insurance, and were perceived considerably earlier. These evils had been corrected to a notable extent before the inauguration of the more or less standard Accident Program already described, but the history of Health Insurance may be briefly outlined for the sake of completeness.

In the early years of the Twentieth Century a typical Health Policy usually provided:

1. \$5.00 per week for total disability while confined to the house.
2. \$2.50 per week for total disability not confined to the house (disability in the aggregate not to exceed 52 weeks in duration).
3. Limited surgical and hospital benefits.

By 1915 many policies were being issued providing:

1. \$5.00 per week for total disability, even for life, whether confined to the house or not.
2. \$2.50 per week for partial disability.
3. Limited surgical and hospital benefits.

This later type of policy soon began to cause alarming losses, and the attempt to correct the situation by increasing premiums had the same effect as has been perceived in disability with Life Insurance and in other fields, namely, a vicious circle of adverse selection with even greater losses.

Because of the mounting losses, the Bureau collected statistics for six years beginning with 1921 by the means of Hollerith cards sent into the Bureau. The experience clearly revealed facts which, in most companies, led to:

1. Elimination of partial disability and life indemnity.
2. The introduction of policies with waiting periods.
3. Reversion to reduced payments for disability not confined to the house.
4. The elimination of policies for excessive amounts.

Bureau action towards standardization in 1932 as far as Health Insurance was concerned merely attempted to crystallize, either formally or informally, some improvements in practice which had already been instituted in most companies.

As far as premium volume is concerned, Health Insurance is not an important factor in most companies today operating in the Commercial Accident and Health field.

C. Treatment of Renewals

Under Commercial Accident and Health policies, the premiums on renewals can legally be increased by the company at any time. In the past, companies have been reluctant to take this step. With a large volume of outstanding business issued at rates perceptibly less than the rates in effect for new business today, many companies felt it imperative to make some rate adjustments in this old business. However, with the immense variation in types of outstanding policies and premium rates among the companies, it was not felt that this should be handled through the Bureau, although the Bureau gave the movement active encouragement. Today, a very large volume of business originally issued at inadequate rates has been placed on an adequate basis either by reduction in benefits or increase in premium.

D. Compilation of Accident Experience

In addition to the standardization of policy benefits and premium rates on the basis of such information as was available, the Bureau took steps to have the combined experience of the member companies collected and kept up to date as far as possible, as had already been done for a six year period in the case of Health Insurance. The exposure and claims under each policy have been sent to the Bureau monthly, beginning with the exposure of policy year 1931. The experience on two full policy years, 1931 and 1932, has already been compiled. The experience for these two years was decidedly unfavorable, as would be expected from the economic situation then existing. The combined loss ratio on all policy forms (male only) for policy year 1931 was 60% and for policy year 1932, 56%, whereas the rates at present in use contemplate a loss ratio, excluding claim expense, of 45%.

The Annual Statements of the companies for the calendar year 1934 have indicated that the decline in losses has persisted, so that it is not going too far to say that the adequacy of the rates now in use may be regarded as tentatively confirmed. The high loss ratios for the two years in question are due partly to numer-

ous death claims and prolonged indemnity claims, but also, to a large extent, to an inadequacy in the rate structure then in effect. Since 1931, rates have been increased in the case of new business, and, in many companies, in case of renewals. Improving economic conditions coupled with increased rates should keep the loss ratio at a satisfactory level.

The subjects investigated by the Statistical Committee of the Bureau are:

1. Experience by policy form.
2. Experience by classification.
3. a. Experience by size of policy (principal sum).
b. Experience by size of policy (weekly indemnity).
4. Experience by age.
5. Experience by territory.
6. Distribution of claims for total disability and claims for partial disability by length of period of disability.

It is also the intention of the Bureau to keep a running account of experience by occupation, leaving the summarizing of such experience to be completed when sufficient volume has been accumulated or when some particular information is needed.

It is not the purpose of this paper to give in detail the results of this recent experience, especially since the detailed experience available is restricted to two of the worst years in the history of the business. A few points, however, may be mentioned.

The death rate by amount, that is, weighted by amount of exposure, in class A for males was 1.08 per thousand in 1931, and .92 per thousand in 1932, as compared to .79 per thousand provided for in the rates charged today. The actual net cost of \$1.00 per week total disability in class A male for 1931 was \$.189 and for 1932 \$.170 as compared with \$.15 provided for in the rates. The corresponding cost of partial disability was .080 in 1931 and .079 in 1932, as compared with \$.06 provided for in the rates.

The experience has conclusively confirmed our ideas as to the relatively unfavorable experience on policies of large amounts both as regards death and weekly indemnity, and also has clearly confirmed the need for an additional premium charge for the death benefit with higher ages. It indicates a slightly higher rate

of disability with the higher attained ages as far as weekly indemnity is concerned.

E. Statistical Methods

The general principles of conducting an investigation into Commercial Accident and Health experience may be of interest. The exposure is reported by means of a punched card for each premium payment, and the claims by corresponding cards for each claim. There are two methods of summarizing the experience:

1. By obtaining loss ratios (claims divided by premiums).
2. The pure premium basis (by obtaining the probability of accidental death, the number of weeks of disability per life year, etc.).

Method (1) is much less laborious, but the uses to which it may be put are somewhat limited and it becomes of somewhat doubtful value for combined experiences of various companies charging premiums which are not uniform. For calculation of rates, method (2) is the ideal method. The various probabilities under method (2) may be calculated on either a "number" or an "amount" basis, using the phraseology of Life Insurance experience. For the former, the number of life years of exposure are tabulated and the number of weeks of disability. For the latter, we have to obtain the amount of dollar-years exposed for principal sum or weekly indemnity, and from the claims obtain the amount of claim payments. In obtaining the exposure, the exposure cards may be either sorted by the term of the policy and the amount of principal sum or weekly indemnity multiplied by the term in months, or the cards may be sorted by the amount of principal sum or weekly indemnity and the amount in each case multiplied by the sum of the number of months. The work may be materially shortened by punching master cards for the totals in each group.

Most of the work of the Bureau Committee has been devoted to obtaining pure premiums for the various benefits. In the case of occupational experience, however, loss ratios were deemed to be sufficiently accurate on the assumption that there would be no reason to suppose that in any one occupation there should be an undue proportion of business from a company with rates higher or lower than the average.

F. The Outlook

One question may very naturally be asked, "Does the movement toward more accurate determination of statistics and more scientific rates mean a tendency for Accident and Health premiums to move up and down from year to year with changes in current experience?" Probably no one would care to give a categorical answer to this question. The traditions of the business, sold as it has been as personal insurance in a manner similar to Life insurance, are against frequent changes in rates. Undoubtedly in the past, however, we have erred too much in the other direction. If, by keeping track of current experience accurately, we are able to see the need for any major rate changes, and act promptly, it will be for the best interests of the business.

Certainly, the tendency in the last few years towards standardization of policy language, elimination of "frills" and complicated policy benefits, and toward scientifically determined premiums has put Accident and Health insurance in a much more satisfactory position than has been the case for many years.

COMMERCIAL ACCIDENT AND HEALTH INSURANCE
FROM THE STANDPOINT OF THE
REINSURANCE COMPANY

BY

HOWARD G. CRANE

Commercial accident and health premiums written during 1934 by casualty reinsurance companies amounted to approximately \$2,100,000. By comparison with the entire volume of commercial accident and health premiums written, reinsurance companies' premiums appear inconsequential. However, since reinsurance facilities are necessary for many companies issuing accident and health policies, some consideration of the position of the reinsurance companies may be of interest.

The need for reinsurance in the accident and health field arises out of the fact that a direct-writing company may be exposed as the result of a single accident or illness for a greater amount of loss than it considers prudent to have at risk contingent upon the happening of a single event. One contingency against which reinsurance protection is desirable is the loss of several insured lives through a single accident, such as the sinking of a steamship. Another contingency is the possibility of an accident or illness involving a single assured upon whom a large line of insurance has been extended.

Reinsurance against the loss of several lives through the occurrence of a catastrophe is provided by treaty on an excess basis. A typical treaty would provide reinsurance up to \$250,000 in excess of \$20,000 ultimate net loss to the primary insurer, the direct carrier's net loss for the purpose of the reinsurance cover to be considered not more than \$5,000 single indemnity, nor \$10,000 double indemnity, any one life. With such a cover more than two lives insured by the direct-writing company would have to be lost in a single accident before the reinsurer could be

involved. As premium a flat percentage of the direct-writing company's net accident premiums written would be specified in the treaty. Inasmuch as the loss of the lives of more than two assured of a single company in a single accident is a very infrequent happening, the premium charged for a cover of this type is small, and such premiums constitute only a minor portion of reinsurance companies' accident premium volume.

By far the major portion of the reinsurance companies' accident and health premiums represent reinsurance accepted on a share basis for the purpose of relieving direct carriers of large commitments on individual insured lives. When a direct-writing company provides insurance against accidental death to an individual assured in an amount greater than it cares to retain for its own account, reinsurance on an excess basis is not feasible. Inasmuch as the happening of the contingency insured against will require the payment of the entire principal sum, the reinsurer must receive a pro-rata share of the premium in the proportion that the liability it assumes bears to the total amount insured. With respect to the weekly or monthly indemnity for injury or illness, it would be possible in theory to reinsure on an excess basis so that the reinsurer would take up the loss payments after the product of the periodical indemnity and the duration of the disability had resulted in loss payments aggregating some specified sum. However, the loss cost to the reinsurer under an arrangement of this type would be dependent upon such factors as the amounts of indemnity insured on individual lives, and policy provisions respecting the periods of payment for total and partial disability. These are matters concerning which the practice among direct-writing companies varies so greatly that the determination of an equitable reinsurance premium would present an insurmountable obstacle in the way of arranging a disability reinsurance contract upon an excess basis. Hence the only satisfactory arrangement for reinsuring a portion of large lines of accident or health insurance on individual lives is upon a share basis.

The most obvious share basis would be the reinsurance of a fixed, unvarying share of the insurance upon each life insured by

the primary carrier. Such a basis would, of course, be objectionable to direct-writing companies, since to afford themselves adequate reinsurance on large policies they would be required to reinsure heavily on small policies which were entirely within their own carrying capacity, and they would thus be giving off as reinsurance an unduly large portion of their premiums. Furthermore, the need for reinsurance exists only as respects the larger sums insured on individual lives. Hence the practice is to reinsure upon what is known as the surplus share basis. The primary carrier retains all policies where the aggregate sum insured per life does not exceed some amount specified in the reinsurance treaty. Where the amount insured exceeds that specified, the surplus is reinsured on a share basis, subject, of course, to some specified maximum amount. For example, a treaty may provide that where the amount insured on any one life exceeds \$5,000 principal sum, or \$25 weekly indemnity, the surplus over these amounts shall be reinsured on a share basis subject to a maximum amount of reinsurance of \$10,000 principal sum and \$50 weekly indemnity. With such a treaty, if a direct-writing company wrote a policy, or policies, on an individual aggregating \$15,000 principal sum and \$75 weekly indemnity, it would reinsure \$10,000 principal sum and \$50 weekly indemnity, and the reinsurer would receive two-thirds of the premium and would pay two-thirds of all losses, large or small. It is customary for the reinsurer to participate proportionately in all benefits provided by the policies reinsured. Thus, under a treaty such as described in the above example where the maximum amount reinsurable was \$10,000, the reinsurer's maximum loss would be \$20,000 as respects reinsurance of a policy with double indemnity benefits. It is also customary, in the event that there are several policies on a single assured, that all policies be reinsured proportionately.

To the reinsurance companies commercial accident and health insurance has been a distinctly unprofitable class of business. The four reinsurance companies writing any considerable volume of this business sustained underwriting losses for the years 1927-1934, inclusive, aggregating \$3,896,395, this being 17% of their earned premiums of \$23,118,444; the ratio of their incurred

losses and claim expenses to earned premiums was 75%. The results by year are shown in the following exhibit :

EXHIBIT I

COMMERCIAL ACCIDENT AND HEALTH EXPERIENCE OF FOUR CASUALTY REINSURANCE COMPANIES (a)

Year	Net Premiums Earned	Ratio Losses and Claim Expense Incurred to Premiums Earned	Underwriting Profit or Loss	Ratio Underwriting Profit or Loss to Premiums Earned
1927	\$3,163,714	70.4%	— \$ 407,898	— 12.9%
1928	3,191,853	67.5	— 432,758	— 13.6
1929	3,208,304	62.5	— 177,812	— 5.5
1930	3,159,481	75.7	— 530,921	— 16.8
1931	3,165,971	96.2	— 1,123,252	— 35.5
1932	2,785,370	83.2	— 609,036	— 21.9
1933	2,305,757	70.1	— 281,163	— 12.2
1934	2,137,994	71.3	— 333,555	— 15.6
Total	\$23,118,444	74.8%	— \$3,896,395	— 16.9%

(a) Employers Reinsurance Corp., European General Reinsurance Co., Ltd., U. S. Branch, First Reinsurance Co. of Hartford, General Reinsurance Corp.

Although the experience of the direct-writing companies during this same period has also been unsatisfactory, their net underwriting losses have been relatively less severe than those of the reinsurers.

The basic cause for the reinsurance companies' unsatisfactory experience is the greater than average loss frequency with respect to persons insured for large amounts of principal sum and indemnity. In the following exhibit is summarized the experience by size of risk compiled by the Bureau of Personal Accident and Health Underwriters for policy years 1931 and 1932, combined, as respects the cost and frequency of death claims on Class A male risks covered by policy forms providing dismemberment and disability as well as death benefits :

EXHIBIT II

EXPERIENCE BY SIZE OF POLICY — DEATH

Principal Sum Group	Exposure (Term in Years)	No. of Claims	Amount of Incurred Losses (Single Indemnity Only)	Claim Frequency (a)	Loss Cost per \$1,000 Principal Sum Exposed (Single Indemnity Only)
0 - \$ 4,999	172,947	141	\$ 251,388	.82	(b)
5,000	146,612	133	554,704	.91	\$0.76
7,500	211,014	187	1,109,915	.89	0.70
10,000	75,536	102	847,798	1.35	1.12
15,000	63,399	95	1,089,047	1.50	1.15
20,000	8,424	19	304,750	2.26	1.81
22,500	2,918	7	134,374	2.40	2.05
30,000	11,779	20	468,675	1.70	1.33
30,001 and over	3,884	12	413,750	3.09	(b)
All Other	23,038	26	279,100	1.13	(b)
Total	719,551	742	\$5,453,501	1.03	(b)

(a) Number of claims per 1,000 years' exposure.

(b) Cost per \$1,000 exposed cannot be computed from data published by Bureau inasmuch as policies contained in group vary in size.

The reinsurance companies seldom participate in risks covered for amounts of \$5,000 or less; in the case of policies issued in units of \$1,500 principal sum, the reinsurers do not usually participate in risks covered for \$7,500 or less. Hence the reinsurers share to only a slight extent in policies which would fall into the first three groups shown in the Exhibit II; their interest is largely confined to risks covered for amounts of \$10,000 or larger—the risks showing a higher than average loss cost per \$1,000 exposure. Furthermore, under the surplus share plan of reinsurance the larger the policy, the larger the reinsurer's participation—and there is apparent in Exhibit II a trend toward increasing loss cost with increasing amounts of principal sum. Obviously under these circumstances the reinsurers must expect principal sum loss ratios substantially higher than those experienced by their ceding companies.

The dismemberment and disability experience by size of risk as compiled by the Bureau on the same group of policies is summarized in Exhibits III and IV.

EXHIBIT III

EXPERIENCE BY SIZE OF POLICY — DISMEMBERMENT

Weekly Indemnity Group	Exposure (Term in Years)	No. of Claims	Amount of Incurred Losses (Single Indemnity Only)	Claim Frequency (a)	Loss Cost per \$5.00 Weekly Indemnity Exposed (Single Indemnity Only)
0 - \$ 24.99	104,232	8	\$ 9,300	.08	(b)
25.00	331,206	57	152,782	.17	\$0.092
50.00	178,073	33	167,310	.19	0.094
75.00	13,310	2	9,350	.15	0.047
100.00	33,052	5	64,467	.15	0.098
100.01 and over	8,143	..	..	..	..
All Other	51,535	7	29,045	.14	(b)
Total	719,551	112	\$432,254	.16	(b)

(a) Number of claims per 1,000 years' exposure.

(b) Cost per \$5.00 exposed cannot be computed from data published by Bureau inasmuch as policies contained in group vary in size.

EXHIBIT IV
EXPERIENCE BY SIZE OF POLICY — DISABILITY

Weekly Indemnity Group	Exposure (Term in Years)	Total Disability (a)		Partial Disability		Average No. Weeks Disability per Year Exposed		Loss Cost per \$5.00 Weekly Indemnity Exposed (Single Indemnity Only)
		No. of Days	Incurred Losses (Single Indemnity Only)	No. of Days	Incurred Losses (Single Indemnity Only)	Total Disability	Partial Disability	
0 - \$ 24.99	104,232	97,372	\$ 192,318	75,190	\$ 72,060	.133	.103	(b)
25.00	331,206	391,544	1,407,051	328,125	581,593	.169	.142	\$1.201
50.00	178,073	222,997	1,592,906	226,877	782,187	.179	.182	1.334
75.00	13,310	20,998	224,966	17,391	89,959	.225	.187	1.578
100.00	33,052	49,008	699,116	45,786	314,370	.212	.198	1.534
100.01 and over	8,143	10,959	249,304	10,496	115,976	.192	.184	(b)
All Other	51,535	65,689	367,148	51,763	141,105	.182	.143	(b)
Total	719,551	858,567	\$4,732,809	755,628	\$2,097,250	.170	.150	(b)

(a) Including cost of elective benefits.

(b) Cost per \$5.00 exposed cannot be computed from data published by Bureau inasmuch as policies contained in group vary in size.

In the case of dismemberment benefits the trend is rather inconclusive, probably due to the relatively few dismemberment claims included in the experience. As respects disability benefits the cost clearly rises as policy amounts increase, although the rise is not as sharp as in the case of principal sum benefits.

Although health insurance experience by size of risk is not available for a recent period, compilations made some years ago show that for this class, also, the loss ratios are higher on the larger risks.

The policy years included in the Bureau accident experience, viz. 1931 and 1932, probably comprise the period during which the disparity between loss cost on large and small policies was greatest. This was the period of most severe financial stress, and hence the time when the temptation to holders of large accident and health policies to commit suicide or malingering was greatest. Since that time progress has been made in the direction of restricting amounts of principal sum and weekly indemnity to figures more commensurate with assureds' earning power. Nevertheless, there will probably always be a relatively higher loss cost on large policies than on small.

For some time it has been the custom among reinsurance companies to extend accident or health facilities only to direct-writing companies with whom there are in effect reinsurance treaties covering other kinds of insurance. In other words, it has come to be accepted as a matter of course that underwriting losses on accident and health reinsurance are probable, and the reinsurers have sought to counteract this by securing sufficient amounts of profitable business of other classes. This is obviously an unsound arrangement, and it would be beneficial both to the reinsurers and the direct-writing carriers if accident and health reinsurance could be made to stand on its own feet.

The primary requisite for making accident and health insurance profitable to the reinsurers is a sufficient improvement in the experience of the direct-insurers so that in the aggregate, gross as to reinsurance, the accident and health business is on a profitable basis. Much progress toward this end has been made during the past two years. In order that the reinsurers may sustain no underwriting losses, it is necessary that not only the experience as a whole, but particularly the experience on the larger

policies be improved. The results on large policies can doubtless be improved somewhat by careful restrictions on the amount of principal sum and indemnity insured in proportion to an assured's earnings. Furthermore, regardless of earnings, it would seem desirable to confine the amounts of principal sum coverage afforded on any one life to lower limits than in the past. In view of the higher loss ratios on the larger risks, this should prove beneficial to the primary carriers as well as to the reinsurers. After all, from a social viewpoint there is little justification in most cases for huge principal sum accident policies. The assured's dependents generally need insurance to an equal extent whether death is from accidental or natural causes, and the purchase of life insurance, even though necessarily in much smaller amounts, would seem a better investment from the assureds' standpoint.

A change in reinsurance practice which should prove mutually beneficial would be the retention by the direct-insurer of a disproportionately larger amount of principal sum than of weekly indemnity. The effect of this would be that a larger proportion of the reinsurers' business would relate to the disability coverage on which there is less disparity between the loss ratios on large and small policies. To the primary carriers this would be a sound and advantageous basis of reinsurance. With accident policies customarily issued in units of \$1,000 principal sum and \$5 weekly indemnity, a principal sum loss is the equivalent of approximately four years' disability benefits. As long as accident policies are issued providing life indemnity for total disability, the possibility of disability payments extending over a period considerably in excess of four years is by no means remote. Hence the potential shock hazard with respect to persons insured for large amounts is greater on the disability than on the principal sum side, and accordingly there is more need for reinsurance of the disability hazard.

If the foregoing changes were accomplished, a material betterment of the reinsurers' loss ratios should result. The reinsurers would still be confined to a participation in the larger risks, and consequently would still have to expect poorer loss ratios than the primary carriers. However, since the ceding commission allowances and overhead expenses of the reinsurance companies average a little less than do the acquisition and administrative

expenses of the direct insurers, an equivalent underwriting result might be accomplished in spite of slightly poorer loss ratios.

Whether such changes as suggested would result in a sufficient improvement so that the reinsurers could at least enjoy an even break on their commercial accident and health business is uncertain. In the interest of the continuance of a reinsurance market for accident and health business, some plan for improving the reinsurance experience is essential. The reinsurance companies cannot afford to subsidize the accident and health business indefinitely from the proceeds of other classes of insurance, since profits from the other lines are by no means certain. From the ceding companies' standpoint, steps which will improve the reinsurers' experience will in most cases benefit their own experience as well. Hence it is in the ceding companies' own interest to so adjust their underwriting policies that their reinsurers will have underwriting profits.

ABSTRACT OF THE DISCUSSION OF PAPERS READ AT
THE PREVIOUS MEETING

PRODUCT PUBLIC LIABILITY INSURANCE—JAMES M. CAHILL

VOLUME XXI, PAGE 26

WRITTEN DISCUSSION

MR. FRANCIS S. PERRYMAN:

This is an excellent paper; well conceived and well carried out. It furnishes a good introduction to an important subject that has not been discussed publicly to any large extent. Consequently, any comments on such a paper must be confined to questioning a few minor points and to voicing some thoughts raised by the author's opinions and recommendations.

Product Public Liability is a comparatively new line of insurance which from its very nature must infallibly present to the carriers writing it problems more difficult to handle than those which normally arise with new lines of insurance. The subject matter of this "Products insurance" is the assuming by the companies of risks arising out of the modern tendency of people, particularly in North America, to attempt to make somebody pay for any injurious occurrence. This tendency, commonly called "increased claim consciousness," is in the case of Public Liability being accelerated by the growth of modern advertising with alluring claims; on top of these two forces claim consciousness is being rapidly increased by the very growth of Product Public Liability Insurance. Under these conditions it will take at least several years before claims conditions settle down and in the meanwhile the carriers will have to watch conditions very carefully and keep their coverages and rates as adequate as possible. One of the most severe criticisms that can be directed against the carriers writing this line of insurance is that not only have they, as usual, commenced to write this line with too sketchy coverages and too low rates, but (perhaps because of the great complexity of this line) have allowed these indefinite coverages and inadequate rates to continue much too long without proper readjustment. There also seem to be some car-

riers that do not at all realize the importance of proper study and underwriting for this form of insurance. Last December a broker specializing in this line addressed a very forceful and illuminating open letter to the carriers regarding the rising loss ratios pointing out examples of the extremely loose underwriting of some carriers.

Coming now to comment on specific points in Mr. Cahill's paper it is interesting to note that the loss ratios on this line of business when brought down to a later year than those given by the author, such figures now being available, show some improvement. The two latest policy years' indications are 63% and 65% as against 74% and 74%. Also, the 1934 calendar year has a loss ratio of 57%, which is considerably better than the 1933 and 1932 figures of 76% and 69% respectively. It is also interesting to note that the volume of business in 1934 calendar year shows a further increase over 1933 of more than \$300,000 to \$1,334,000. This improvement may be due to some improvement in the price level in line with the thoughts expressed by Mr. Cahill or may be due to more careful Underwriting Department carriers. The loss ratios which I have termed improved, however, are still quite unprofitable.

Mr. Cahill's paper is first of all a general discussion of the legal background of this form of coverage. It is, of course, essential to have such a discussion; it appears, however, to me that as a matter of actual practice the doubts and safeguards mentioned by Mr. Cahill will, in accordance with present day tendencies in legal practice and in social consciousness, be all resolved in one way, namely in favor of the public and against the assureds and the carriers. I believe that as time goes on it will become more or less accepted that any injured party who can trace an injury more or less directly to any product will be able to sustain a suit against a manufacturer or distributor without great difficulty. This brings up a point which Mr. Cahill might have dealt with more definitely and that is the need of the distributors or retailers for protection. I believe that it is the practice for such retailers to require the manufacturer to protect them either by agreement or by the furnishing of certificates of Public Liability Insurance. I think, however, that this is a cumbersome way of doing business and that eventually we shall see a system whereby direct coverage is granted by an insurance

company to the retailer for any liability that may attach to the retailer.

The second part of Mr. Cahill's paper consists of an extremely useful description of present day forms of coverage and insurance companies' practices regarding Product Public Liability. In reading this and in thinking back to the first half of the paper regarding the legal aspects it strikes me once more that a lot of the difficulties of the insurance carriers, on this line, have been due to indefiniteness and inconsistencies of present policy forms. I understand, however, that there are now being prepared uniform forms and endorsements. Mr. Cahill's description of manual provisions for this form of coverage is fairly complete. He does not mention, however, the handling of manufacturing risks having retail outlets where for complete coverage the manufacturer must pay not only a premium on all goods produced but also a second premium on the goods sold through the retail outlets. In his list of conclusions at the end of the paper Mr. Cahill might have included recommendations regarding the need for revising the rules for dealing with liability arising out of goods sold prior to the policy period. The present manual rules about this apply only to very durable goods and I believe that they will have to be extended to what might be called semi-durable products. Another recommendation that it seems should have been included was for a thorough study and revision of the present system of policy limits and of the limit tables regulating charges for higher limits. A notable but perhaps intentional omission in the paper is the lack of all reference, or at any rate specific reference, to Product Property Damage.

The third and most important part of the paper deals with the difficulties underlying this form of coverage and Mr. Cahill's suggestions dealing with them. Since Products Liability Insurance is still in the formative stages and since this is one of the first public discussions of the line Mr. Cahill's suggestions naturally are intended to and I hope and believe will provoke further study and discussion. All of his suggestions are valuable and to enter into a complete discussion of them, item by item, would require much more time than I have for this review. There are, however, a few comments which may be useful. Apart from the need for clarification of the actual coverage granted

probably the most crying need would seem to be for a change of the basis of exposure, but on the other hand it is probable that it will be very difficult to effect any violent change in exposure bases. It is easy enough to recognize the deficiencies of the system of basing the premium on the dollar volume of sales but it is not easy to make a satisfactory substitution of some other basis. Of course, normally we do not expect such violent fluctuations in price levels as we have had during the past ten years but should such fluctuations become more normal Product Liability Insurance is not the only line where our practices would require some revision. I would point out that there is a line of insurance, namely Plate Glass, where fluctuations in price levels are recognized by means of varying differentials. Another question that presents difficulties is the charging of different rates for different territories. There is no doubt, as is evidenced by Automobile insurance, that differences in law and judicial practice, from state to state, call for some variation of rates territorially. This would probably not be difficult to accomplish for local risks such as retailers but will be much more difficult to do for wholesale risks where the products are distributed over a wide territory. It does not follow, however, that it is impossible to make territorial distinctions even for such risks. One of the most important suggestions put forward by Mr. Cahill is that of the advisability of using some form of deductible insurance. I think with Product Public Liability the writing of business on such a basis will increase and even if deductible coverages do not become the regular rule they will be applied to a considerable proportion of the business.

In conclusion I want to say once more that Mr. Cahill has done an excellent piece of work in setting forth so clearly the present day condition of and practices in this growing line of insurance and in calling attention to the deficiencies in present day methods of handling it, and I have no doubt that his paper will provide a great impetus towards putting this Product Liability insurance on a sounder basis.

F. S. PERRYMAN.

MR. JOSEPH J. MAGRATH:

In directing attention to the potentialities of casualty sidelines, through his paper on Product Public Liability Insurance, Mr. Cahill has performed a service to the business.

The manufacturer, wholesaler and retailer of various products each has a legal liability to the purchaser-consumer which can and must be insured where desired. The reluctance of some insurers to write this coverage is unfortunate. The agency and brokerage forces cannot serve their clients properly unless they point out the prospects of loss and the nature of protection needed. The insurers must provide an adequate and satisfactory market at fair cost.

The extension of retailer protection through the wholesaler or manufacturer is not satisfactory as pointed out by the author. This method is usually impractical and the occasion of loss is frequently unrelated to the responsibility of the latter. Products sold in bulk may be contaminated after arriving at the retail shop through no fault of the wholesaler or manufacturer. That method is impractical from the standpoint that the obtaining of save harmless certificates from all dealers is hardly feasible and may prove valueless when needed.

The reference to legal phases of the insured's liability to customer's is brief but interesting. Some member of the bar should treat with this feature at greater length.

The absence of standard forms of a satisfactory nature is not surprising when we realize that the much older casualty lines are not yet standardized. The author is entirely right when he directs attention to the need for this reform.

The aggregate limit as now used is, as stated, for the purpose of protecting the accident limit where a series of claims, although probably arising out of a single mishap, may have no provable relationship. This method, however, has the effect of impairing the customary continuing coverage found in liability contracts. Its most serious defect exists in the possibility of an insured having his coverage exhausted without his knowledge. This condition might come about through lack of knowledge of the final values of pending claims. Caution would dictate that an insured should take the most pessimistic view of pending claims and have his coverage replenished when it appears impaired on that basis. High aggregate limits or automatic restoration for a premium are desirable.

The warrant for expanding the aggregate limit for large risks where the premium bears a high ratio to the aggregate limit is made more apparent when an extreme example is cited, viz:

	Units of Exposure	Basic Premium	Standard Aggregate Limit
Risk "A".....	1,000,000	\$ 1,000.00	\$25,000.00
Risk "B".....	10,000,000	10,000.00	25,000.00
Risk "C".....	25,000,000	25,000.00	25,000.00

Risks B and C would be granted higher aggregate limits at basic rates.

With risk "C" chargeable for a premium equal to the aggregate limit it is inconceivable that such insurance would be either fair or salable. It is obvious that the aggregate limit must bear some relationship to the units of exposure measured by the premium, without excess limit charge.

No exception can be taken to the suggestion that additional interest problems be studied. The extent to which products are handled or processed by the parties at additional interest naturally influences the liabilities of the parties. It is possible that classifications may be graded for additional interest ratings.

The instability of the premium base, when amount of sales is used and economic variations are considered, is indisputable. The sales basis has been used for want of a better practical method. The other bases used are payroll, or fillings, tons, gallons and other units of manufacture or sale. Units other than sales dollars will be developed for additional classes where feasible.

A rate revision which the author said was in order has since been consummated. Many classes remain "a" rated as heretofore, but the number has been materially reduced.

The experience which the author shows as exceeding the permissible in 1930-1933 has improved in 1934 and the value has grown substantially, viz.:

Policy Year	Earned Premium	Incurring Loss Ratio, Including Allocated Loss Expense
1930	\$ 676,633	56
1931	771,053	68

Calendar Year		
1932	822,031	69
1933	1,010,355	76
1934	1,334,636	57

This improvement took place before the rate revision which was made effective in April, 1935. The rate level was increased 11% and minimum premiums were advanced.

Underwriting knowledge must include the good sense to employ medical, chemical and engineering research to avoid risks having such unconscionable hazards as the poisonous cosmetic illustrated in the paper. Deductible coverage may prove a happy solution to a number of underwriting problems as suggested.

Conclusions numbered 5 and 6 sound somewhat inconsistent. In the first a conservative policy of underwriting is recommended, while in the last it is suggested that classes other than food and drug products be developed. It is perhaps not intended that the classes representing food and drug products which buy 80% of the coverage should be discouraged by ultra-conservative standards, nor was it intended that those having a comparatively negligible need for coverage should be high pressured to take what those which need it are denied.

It should be noted that approximately 40% of the total coverage represents New York exposure. This would indicate a need for greater field development. Territory rate differentials are negligible.

The author has developed a commendable study in a fair-minded manner.

MR. MILTON ACKER :

The paper on Product Public Liability Insurance presented by Mr. Cahill at the last meeting of the Society, met a long felt want and was most timely in view of the decidedly adverse trend in the experience for this form of coverage during recent years. This paper is the first comprehensive presentation of the subject embracing as it does a most interesting and enlightening discussion of the legal background, basic coverage, underwriting problems and rating procedure.

It will be observed that little more than ten years have elapsed since this type of insurance protection has become of real importance in the light of premium volume. Information as to the present-day premium writings of all classes of carriers is not available but the 1934 written premiums for stock companies exceeded \$1,300,000. This indicates a continuing upward trend in the vol-

ume of Product Public Liability business and bears out Mr. Cahill's observation that the future will bring substantial increase in the premium volume.

A legal duty is imposed on vendors of food, beverages, drugs, medicines, cosmetics and all other merchandise or products, to exercise due care to the end that the products sold by them are fit for human consumption and will not be harmful to purchasers or others who may have occasion to use the products. This duty exists by common law and also by such statutes as the Federal Food and Drugs Act of 1906 and the Uniform Sales Act. The existence of this important duty sets aside and makes non-applicable the common law doctrine, *caveat emptor* (let the buyer beware), and substitutes therefor the doctrine, *caveat venditor* (let the seller beware). It is proper that particularly in the case of food and beverages, drugs and medicine, and cosmetics, the highest degree of care be exercised by manufacturers in the preparation of their products because the consumer in the average case assumes without question that the consumption or use of these products will not be injurious. The general public purchasing such products are, in a sense, at the mercy of the manufacturers because the latter control the quality and wholesomeness of the products and the purchaser has no means of detecting harmful ingredients or properties. A particularly dangerous situation exists in connection with cosmetics which in some instances have been shown to contain such dangerous poisons as thallium acetate, lead acetate, arsenic and mercury. The Federal Food and Drugs Act contains no provision on cosmetics. It defines a drug as a product intended for the use, protection or cure of disease. Poisonous depilatories or cosmetics may not be labeled as to remedial claims and the Federal Food and Drugs Administration is therefore powerless to prevent their sale. Many distressing cases of injury and death have occurred through the use of cosmetics containing poisonous ingredients. At the present time two different bills are before the Congress providing for a new act to be known as the "Federal Food, Drugs and Cosmetic Act." These bills are described respectively as follows:

A Bill

To prevent the manufacture, shipment, and sale of adulterated or misbranded food, drink, drugs, and cosmetics, and

to regulate traffic therein; to prevent the false advertisement of food, drinks, drugs, and cosmetics; and for other purposes.

(introduced by Senator Copeland), and

A Bill

To prevent the adulteration, misbranding, and false advertising of food, drugs, and cosmetics in interstate and foreign and other subject commerce, for the purpose of safeguarding the public health, preventing deceit upon the purchasing public, and promoting fair competition, with respect of commerce in such products.

(introduced by Senator McCarran).

The annual sale of cosmetics in the United States reaches an enormous figure and purchasers are entitled to Federal protection against the sale of products which contain injurious ingredients or are branded with false or misleading claims on their labels.

Mr. Cahill has set forth the several bases upon which sellers may be held liable to consumers of their products. These are: (1) breach of express warranty or implied warranty as to fitness or merchantability; and (2) negligence. It is stated that probably alleged breach of warranty forms the basis on which suit is instituted more frequently than does negligence for the reason that negligence is difficult to prove. This is undoubtedly true with respect to products of a non-durable character such as food and beverages. The presence of foreign or deleterious substances can be detected and a sound negligence case can be established; but breach of warranty undoubtedly constitutes the major basis of suit for such products. This is not necessarily true, however, with respect to products of a durable character such as refrigerators, heating apparatus, electrical appliances, elevators and machinery. For such products it would seem that bodily injury would be caused in most cases by defective materials used or defective workmanship in the manufacturing process. Negligence is here involved and should not be difficult of determination and proof where claims are legitimate. Breach of warranty may be brought into the picture but fundamentally it is believed that negligence will provide the true basis of the suit.

Product Public Liability Insurance policies provide the usual type of protection which is specified in Public Liability policies,

namely, coverage for the liability imposed upon the assured by law for damages as the result of claims arising out of accidental bodily injuries including death at any time resulting therefrom. This is one of the third party liability coverages and claims of employees of the assured while engaged in his business are excluded. While underwriters agree that the basic coverage should include claims due to illness, disease or disability, it has been questioned whether such coverage is clearly indicated by the wording of the Insuring Agreements of the policy. In this connection it may be interesting to quote a few definitions. The word "accidental" is defined by Webster as—"Happening by chance or unexpectedly; taking place not according to the usual course of things." Couch on Insurance says the following with respect to the definition of "accidental"—

"Death following the eating of mushrooms ordered in a restaurant or oysters or any other kind of food that is usually wholesome but unexpectedly proved to be poisonous, it is obvious that there was in the chain of causation a contributing factor whose presence was so unintentional, unexpected and unusual as to bring the whole series of causative acts within the accepted definition of the accidental."

The Supreme Court of Nebraska has defined the word "accidental" as used in an indemnity policy as—"An undesigned and unforeseen occurrence of an afflictive or unfortunate character resulting in bodily injury to a person other than the insured." There seems little question but that illness or disease resulting from the consumption of food represents an accidental occurrence and also bodily injury within the coverage contemplated by the policy. Whether or not the Insuring Agreement of the policy requires clarification in this regard is a question which must be decided ultimately if a standard form of Product Public Liability Insurance policy is finally developed.

It has been suggested that the basic coverage should apply with respect to claims for mental anguish. Such claims may be brought by relatives of persons who suffer illness, disease or disability as the result of consumption or use of food or other products. Mention has been made also of claims for real or alleged injuries due to physical peculiarities or susceptibility of individuals to products which are not harmful in themselves but the use of which, particularly foods, drugs or cosmetics, may result in skin erup-

tions, infections or other types of bodily injury. These cases have been referred to as "idiosyncrasy" or "allergy" claims. The courts do not recognize contributory negligence as a defense against such claims and it is not difficult to visualize the possibilities involved from the point of view of fraudulent claims alleging such injuries.

Another type of claim which is of interest in connection with Product Public Liability Insurance is represented by suits against manufacturers by dealers or others who are injured in their business and reputation through the sale of the manufacturer's products which are unfit for human consumption or use and cause injury to customers of the dealers.

Underwriters may not agree as to whether existing policy forms provide coverage for the foregoing types of claims. In this connection it is noted that the coverage runs to liability imposed by law upon the assured for damages, which damages are on account of or arise out of bodily injuries or death. It may be contended that this wording implies complete coverage for such claims, even though the advisability of providing such coverage may be seriously questioned by some.

It is pointed out that for restaurant risks Product Public Liability coverage applies for the hazard of food consumption both on and away from the assured's premises, whereas for other risks coverage on the assured's premises is provided under Owners', Landlords' and Tenants' or Manufacturers' and Contractors' Public Liability policies. Extension of the principle of complete division in coverage for the food consumption hazard as compared with the ordinary premises hazard, is a logical and necessary development. This principle might well be recognized in connection with Apartment Hotels, Delicatessen Stores, Department Stores, Drug Stores, Confectionery Stores, Five and Ten Cent Stores, Hotels, Ice Cream Parlors, Retail Bakeries and possibly other classes of risks. Separate and distinct elements of hazards are involved in risks of this character where food is served for consumption on the premises and this condition should be recognized by separate rates and coverages.

Mr. Cahill points out that policies are ordinarily interpreted to cover claims alleging either negligence or breach of implied warranty, whereas breach of express warranty is considered not covered because it is believed such cases are of a contract nature and

arise out of liability voluntarily assumed by the assured. There is reasonable doubt whether a carrier could successfully deny liability by reason of breach of express warranty on the basis explained. It may not be necessary to specify coverage in the policy for implied warranty but good reason exists for a specific exclusion with respect to coverage for express warranty. To provide such coverage might, in effect, be equivalent to guarantee on the part of the insurance carrier that the assured has used proper methods and harmless ingredients in the preparation of his products and that the products may be consumed or used with safety by anybody. A broad coverage of this kind is dangerous and affords an easy method for unscrupulous manufacturers or dealers to secure insurance protection, to the eventual disadvantage of reputable concerns selling products of the highest quality. An analogy might be drawn here to Property Damage Liability Insurance issued to Manufacturers or Contractors where the basic coverage excludes damage to property in the care, custody or control of the assured or his employees. Provision for such coverage in the average case would again be equivalent to a guarantee on the part of the insurance carrier of the proper performance of the assured's operations.

The rates for Product Public Liability Insurance are applied by classification to the total sales (or other basis of premium specified) of all merchandise or products sold or handled by the assured. Ordinarily, manufactured products are sold to the consumer by independent dealers. In some cases manufacturers maintain their own retail store organization, for the direct sale and distribution of their products to the consumer. This condition has been recognized recently by a provision that the rates in the territory where the manufacturing operations are conducted shall be applied to the total factory sales including sales or the sales value of consignments to stores or subsidiary organizations of the assured. If complete coverage is desired on manufactured products of an assured who also operates stores, additional charges are made on the total store sales of such manufactured products at the rates in the territories where the stores are located. This procedure recognizes the separate elements of exposure which exist with respect to manufacturing operations and retail store operations. Where the latter are conducted by independent dealers the manufacturer and the dealer are each charged

their proper premium for the coverage. If the manufacturer operates retail stores, the same premium charge is imposed for the store operations as if they were conducted by independent dealers. It would be desirable from an underwriting standpoint to require concurrent coverage in the same company with respect to such manufacturing and retail store operations conducted by the same assured. It is difficult, however, to apply such a rule in practice because of varying conditions in individual risks. In some cases the operations may be conducted at scattered points throughout the country or numerous products in addition to the manufactured product of the assured may be handled in the stores. Under such conditions an assured cannot necessarily be required to purchase complete Product Public Liability coverage from a single carrier.

A real problem exists in connection with products of a durable nature where complete coverage is to be provided for all products sold during the policy period and also prior to the inception date of the policy. The difficulty of identifying the date of sale of such products has been mentioned. This condition points to the advisability of an underwriting requirement that complete coverage shall be required for prior sales on products of a durable nature where it is not possible to determine the date of sale. Proper additional premium charge shall be made for coverage on products previously sold. Unless such an underwriting procedure is followed, coverage may be afforded for products on which no premium charge is made. A number of classifications referring to durable products have been designated in the Manual to the effect that the rates and minimum premiums exclude coverage for products manufactured, sold, handled or distributed prior to the effective date of the policy. It is assumed that coverage for prior sales will be required by the underwriter with an additional premium charge unless the date of sale can be identified, in which event coverage for prior sales may be excluded if the assured so desires.

The development of a proper method of rating for coverage on prior sales requires further study. Mr. Cahill points out that it would be desirable to develop a general rating method for this coverage but there is question whether the application of a uniform rating procedure will produce equitable results in all cases when consideration is given to the wide variety of products and

varying degrees of exposure in connection therewith. One feature that should be kept in mind is the need for a rating procedure that will permit the development of experience on a proper basis as respects prior sales and current sales, so that rates made on the basis of the developed experience will measure properly the exposure in connection with the products to which such rates are to be applied. The writer cannot wholly agree with Mr. Cahill's observation that the liability is much greater in the case of a firm that has been in business for many years than for a new concern which has recently started operating. This would be true if the hazards in connection with products of a similar character manufactured or distributed by different concerns, were the same. However, a manufacturer may have been in business for many years and established an excellent reputation with respect to the reliability and quality of his product. An accumulated exposure exists in connection with products sold prior to the effective date of the policy. A new concern manufacturing a similar product may use methods or materials in the manufacture of his product which do not conform in any manner to the high standard set by the older concern. It is possible that hazards for the products sold by the newer firm during the policy period will actually be greater than for the products covered for both current and prior sales under the policy of the older firm.

The question of coverage for additional interests under Product Public Liability policies has created some difficult underwriting problems because of the increasing tendency of store operators or other dealers to shift their liability in connection with certain products which they handle, to the manufacturers of such products. This is accomplished through an agreement requiring the manufacturer to hold the dealer harmless or a requirement that the manufacturer shall provide Product Public Liability Insurance for the dealer. It would be desirable to establish definite rules with respect to additional interests' coverage but for the present at least, underwriters seem to agree that this is both impractical and inadvisable. Conditions as respect the liability of additional assureds vary materially according to the nature of the product and the nature of the additional assureds' operations. It is this writer's opinion that the granting of coverage for additional interests under Product Public Liability policies should be discouraged as much as possible. A direct liability is imposed on

all vendors of products as to the fitness of same for human consumption or use. This condition applies, regardless of who the manufacturer may be, by reason of implied warranty. In addition to this some element of negligence, however slight, may be involved in many cases. If a vendor desires coverage for his liability, it should be secured by the purchase of a separate policy. As a practical matter, however, the carriers today must be in a position to make coverage for additional assureds available to their policy holders.

It has been pointed out that implied warranty exists in all cases where coverage for vendors is provided. The most limited form of additional interests coverage beyond this would be the case where all coverage for negligence of the additional assured is excluded and the coverage is restricted to the handling of claims against the additional assured which are, in effect, misdirected and which should have been brought directly against the manufacturer or principal assured. Such restricted coverage can be written most effectively on products of a durable character, where the products are not subject to spoilage or deterioration or where the form of the products is not changed by the additional assured.

The situation becomes more complicated where food products are involved which are ordinarily subject to spoilage, where the form of the product may be altered by the additional assured or where the products are rehandled in some manner as to introduce the element of negligence through acts or omissions of the additional assured. In these cases the element of liability for negligence is involved, the result of which is to place the coverage for the additional assured on a basis fundamentally different from that contemplated under ordinary additional interest coverage. All of these conditions may vary from risk to risk to such an extent that the establishment of a fixed rating procedure would produce results difficult to justify in many individual cases. A further problem exists as respects the difference in the amount of sales for the same number or volume of products sold by a principal assured and by additional assured due to differences in wholesale and retail prices. This feature is of importance in considering charges for additional interests on a percentage basis. There is a further problem in connection with coverage under manufacturers' policies of large numbers of individual dealers

handling the manufacturers' product. It may be difficult to justify the same premium charge for each individual dealer as under a separate policy issued to such dealer, even in cases where coverage for direct negligence of the dealer is involved. This is true particularly in those cases where the product under consideration is but one of a large number handled by the dealer, and where coverage for other products handled is not desired and cannot be required.

There can be no denying the fact that the sales basis of premium charge is not ideal and may produce inconsistent results in individual cases. It is agreed that the use of a unit or quantity of product basis is to be preferred where practicable. A review of existing Manual classifications discloses 16 in number for which the unit or quantity basis applies, and 74 classifications for which the sales basis applies. Of the latter a change to a unit or quantity basis may be considered for 24 classifications or a total of 40. For the remaining 50 classifications conditions are such in the writer's opinion that the sales basis of premium charge must or should be retained. A listing of these groups of classifications follows:

UNIT OR QUANTITY BASIS
(Now Applicable)

- Bottle Manufacturing—for beverages under pressure
- Bottling—soft drinks
- Bottling—spring water
- Bottling—siphons
- Breweries:
 - Beer or Ale—bottled
 - Beer or Ale—not bottled
- Coal Mines
- Distilleries, Rectifiers or Bottlers of Distilled Products
- Elevator Manufacturing
- Gases—Shipped in Steel Containers:
 - Cylinders
 - Drums
 - Tank Cars
- Gasoline or Oil Supply Stations—retail
 - Gasoline, Kerosene, Fuel Oil
- Oil or Gasoline Distributing:
 - Gasoline, Kerosene, Fuel Oil
- Wine Mfg. or Bottling:
 - Still Wines
 - Sparkling Wines

UNIT OR QUANTITY BASIS SUGGESTED
(Sales Now Applicable)

Auto Hoist Mfg.
Butter or Cheese Mfg.
Canneries—N. O. C.
Cattle or Stock Food Mfg.
Chocolate Mfg.
Cigar or Cigarette Mfg.
Coal Dealers
Confectionery or Chewing Gum Mfg.
Cracker Mfg.
Creameries—Milk and Cream
Flour Mfg.
Hair Waving Machine Mfg.
Ice Cream Mfg.
Ice Dealers or Producers
Ladder Mfg.
Milk Products Mfg.
Packing Houses
Paint or Varnish Mfg.
Perfumery Mfg.
Refrigerating Apparatus Dealers
Refrigerating Machine Mfg.
Sausage Mfg.
Sugar Mfg.
Tobacco Mfg.

SALES BASIS NOW APPLICABLE
(No Change Suggested)

Advertising Sign Mfg.
Bakeries
Beer Gardens, Taverns or Parlors
Breakfast Food Mfg.
Caterers
Chemical Mfg.
Cleaning and Dyeing
Clothing—Wearing Apparel or Dry Goods Mfg.
Cosmetics, Hair or Skin Preparations Mfg.
Drug, Medicinal or Pharmaceutical Preparations Mfg.
Electrical Equipment or Appliances Mfg.
Elevator Installation, Servicing or Repair
Extract Mfg.
Food Sundries Mfg.
Fruit Juice or Syrup Mfg.
Fruit Preserving
Furniture Mfg.

Gasoline or Oil Supply Stations—retail:

Lubricating Oils, Greases and Automobile Accessories or Supplies

Glassware, Porcelain or Vitrified Products Mfg.

Heating Apparatus Dealers

Heating Apparatus Mfg.

Instrument or Optical Goods Mfg.

Laundries

Macaroni Mfg.

Machinery Mfg.—N. O. C.

Metal Goods Mfg.—N. O. C.

Oil or Gasoline Distributing:

Lubricating Oils, Greases and Automobile Accessories or Supplies

Paper or Paper Goods Mfg.

Pickle or Relish Mfg.

Polish or Dressing Mfg.

Pyroxylin Products Mfg.

Restaurants

Soap or Soap Powder Mfg.

Steel or Wire Wool Mfg.

Stores:

Clothing, Wearing Apparel or Dry Goods Stores

Confectionery Stores

Delicatessen Stores

Department Stores

Drug Stores—retail

Drug Stores—wholesale

Five and Ten Cent Stores

Grocery Stores—retail or wholesale

Liquor or Wine Stores—retail or wholesale

Mail Order Houses

Meat, Fish or Poultry Stores or Dealers

Meat, Grocery and Provision Stores Combined

Stores—Food or Drink—N. O. C.

Stores—not Food or Drink—retail or wholesale—N. O. C.

Surgical Supplies Mfg.

Toy Mfg.

A revision of the rates for Product Public Liability Insurance has been made since the paper under discussion was written and it is anticipated that a further review will be made of these rates in the light of additional and later experience to be filed during the current year. The recent revision resulted in an average increase in the rate level, with both increases and decreases in the rates for some classifications and no rate changes in the rates for others. A general increase in the scale of minimum premiums was

made concurrently with the rate revision. The volume of Product Public Liability experience over a five year period is fairly substantial in the aggregate. However, when this experience is reviewed by individual classification it is extremely limited for all but a relatively few classifications. This condition makes the rate makers' problem difficult and in addition to the actual experience indications reliance must be placed upon combinations of experience for a number of classifications, consideration of analogies in hazards between individual classifications and upon underwriting judgment in the rate making process.

The principle of varying rates by territory in accordance with territory conditions, should be extended wherever possible. There are certain locations where liability claim conditions are notably bad and this is true of Product Public Liability as well as other Liability coverages. Uniform countrywide rates applied to business in such territories will inevitably produce an underwriting loss. It is probably true that the distribution of products of a durable nature is so broad in the average case that territory rates are not, in general, practical for such products. For food and other products which are largely or entirely consumed locally, the application of territory rates is feasible and should be introduced. This problem is to receive further study by the rate makers. It may be possible to apply for Product Public Liability Insurance a principle similar to the principle in Automobile Insurance whereby in effect, risks are assigned to the territories where the operations are conducted and losses developed in other territories are allocated to the home territory.

Product Public Liability Insurance creates some real difficulties for the underwriter in the handling of small risks. Present day rates are low and the volume of products sold must be substantial before a premium in excess of the minimum is produced. A considerable hazard is assumed by the carrier even on the small risk. The exposure to loss is probably greater in comparison for Product Public Liability than in other Public Liability risks of equivalent premium size. One explanation of this may be the tendency for a relatively larger percentage of fraudulent claims to be made in the case of Product Public Liability coverage. It is exceedingly difficult for the carriers successfully to resist such claims in many cases because of lack of facts, evidence or definite proof as to the responsibility of the assured for the alleged in-

juries. Small risks are not looked upon with favor by underwriters unless adequate minimum premiums may be charged. One possible solution of the difficulty referred to by Mr. Cahill is the writing of coverage on a deductible basis, particularly in the case of foods, drugs and cosmetics. It is probable that a rather wide variation in the distribution of claims by size exists within the Manual classifications. This may be accounted for by the fact that certain products such as food, are apt to produce a larger number of fraudulent claims with a lower average cost per claim than products of a durable nature. There is need, therefore, for a certain flexibility in the determination of rate discounts for deductible coverage, dependent upon conditions in the individual risk.

A justifiable caution is being exercised by underwriters in the acceptance of Product Public Liability business. The reasons have been stated. This condition will have the natural effect of retarding a development of the line. The present-day premium volume indicates that the amount of insured business is insignificant when consideration is given to the tremendous quantity of products and merchandise of all descriptions which are manufactured and sold annually in this country and which are potential purchasers of this form of coverage. The development of forms of coverage and a rating and classification procedure which fit the needs of the business is essential before this coverage is popularized and more of the better type of assured are attracted to and convinced of the desirability of purchasing the coverage.

AUTHOR'S REVIEW OF DISCUSSIONS

MR. JAMES M. CAHILL:

The discussions of Messrs. Acker, Magrath and Perryman add considerably to the available written material on Product Public Liability Insurance. The writer now feels that his paper was worthwhile if for no other reason than that it prompted Mr. Acker's valuable comments based on his broad underwriting experience with this line of business.

Both Mr. Magrath and Mr. Perryman commented upon the apparent improvement of the Product Public Liability experience in view of the fact that the loss ratio reported for calendar year 1934 was 57%. The writer believes that too much weight should

not be given to this calendar year indication when one considers its basis. It is likely that the loss ratio of 76% developed for calendar year 1933 was too high, whereas that of 57% for calendar year 1934 was probably too low. The policy year loss ratio data as of December 31, 1934, compiled by the National Bureau of Casualty and Surety Underwriters show the following loss ratios for policy years 1931 to 1934:

Policy Year	Incurring Loss Ratio (Including Allocated Claim Adjustment Expense)
1931	65%
1932	71
1933	63
1934	65

The loss ratio shown for policy year 1934 is not a reliable indication of the ultimate result for this policy year, of course, since the experience is only as of 12 months' development.

Mr. Magrath has suggested that some member of the bar treat with the legal phases of the assured's liability to customers at greater length than the writer was able to do. If this suggestion is followed, it will undoubtedly prove of value in creating a better understanding of the legal problems involved in this coverage. Furthermore, such a paper would be invaluable to claim departments.

Mr. Perryman suggested that the writer should have included a recommendation for a thorough study and revision of the present system of policy limits and of the limit table regulating charges for higher limits. This recommendation would apply equally well to all of the Liability lines, other than Automobile. The omission of reference to Product Property Damage Insurance was intentional. It would be preferable to include this line in a general discussion of all of the Property Damage lines, other than Automobile.

The discussions bring the writer's paper up to date on several points, since they include reference to certain changes adopted at the April 8, 1935 general revision of Product Public Liability rates. At this revision, Special Tables A and B were adopted for this line replacing Tables A and B. Higher rates for New York State than for the remainder of the country were adopted for Confectionery Manufacturing, Confectionery Stores and Ice

Cream Manufacturing, and the territorial differential for Bakeries in Massachusetts and New York State was continued. Specific notation was also made in the case of a number of classifications to the effect that the rates and minimum premiums exclude coverage for products manufactured, sold, handled or distributed prior to the effective date of the policy. If such coverage is desired under these classifications, the risks must be submitted to the National Bureau for rating. In connection with the problem of developing a general rating method for coverage on outstanding products, the writer is inclined to agree with the comments made by Mr. Acker in his discussion.

Mr. Acker has also pointed out that the food consumption hazard for risks other than restaurants should probably likewise be covered by Product Public Liability Insurance rather than by the Owners', Landlords' and Tenants' or the Manufacturers' and Contractors' Public Liability policies. This would indeed be a logical development and in time this change will probably be made in the case of those risks which include a substantial food consumption hazard. In conjunction with the filing of Owners', Landlords' and Tenants' Public Liability classification experience with the National Bureau in the fall of 1935, it is the writer's understanding that a segregation of the loss experience of certain classifications between food consumption losses and all other losses will be required in order to obtain an indication as to the necessity for such a change.

At the April 8, 1935 revision, the Product Public Liability standard minimum premium was increased from \$25 to \$35 per annum. This is the highest standard minimum premium for any of the Liability lines, other than Automobile. Furthermore, there are higher special minimum premiums specified for most of the important Product Public Liability classifications. The need for a substantial premium charge even on small risks is explained fully by Mr. Acker.

Mr. Magrath has properly pointed out that the insurance companies must employ the technical assistance of medical, chemical and engineering analyses in order to avoid risks having such hazards as to make them uninsurable for Product Public Liability coverage.

In considering the value of the deductible method of writing coverage for Product Public Liability, due consideration must be

given to the comments of Mr. Acker regarding the determination of the rate discounts. Since the discounts employed at the present time are based on the experience of the Owners', Landlords' and Tenants' Public Liability line, it is quite likely that they are not quite correct for this form of coverage on certain types of risks. This subject deserves further study.

Mr. Magrath has stated that conclusion 5 suggesting that a conservative policy of underwriting be followed and conclusion 6 suggesting that an attempt be made to develop the premium volume on classes other than those dealing with food or drug products sound somewhat inconsistent. It was not the writer's intention to recommend that coverage be denied generally to those risks handling food and drug products, but rather that adequate rates be insisted upon and that many of these risks be written on a deductible basis in order to coerce an improvement in the experience. The recent epidemic of food poisoning cases in the vicinity of New York City as the result of tainted pastry from one bakery is an example of the possible catastrophic loss which may be incurred on this coverage. There are undoubtedly many concerns other than those dealing with food or drug products which would consider it to be a wise move to purchase Product Public Liability coverage if the subject were brought to their attention. If this coverage is popularized and more of the better type of assureds are sold protection, the development of the line will be on a much sounder basis than at present where the coverage is purchased largely by only such risks as have learned through actual experience that there is a great need for it.

REPORTS OF CASUALTY INSURANCE LOSS RESERVE
SCHEDULES—JOHN R. LANGE

VOLUME XXI, PAGE 50

WRITTEN DISCUSSION

MR. THOMAS F. TARBELL:

It was both appropriate and timely that Mr. Lange should bring to our attention the very important inconsistency arising from the fact that, although meticulous care and consideration have been given to the determination of asset values in recent years, the corresponding liabilities or reserves have generally been

accepted more or less at face values. His paper should be of particular interest to supervisory authorities and should help to prevent a recurrence, or at least mitigate the severity, of some failures such as have occurred in the last four years.

The problem of proper reserves for the Liability and Compensation lines which involve claims of long term duration is at best a difficult one, both from the standpoint of the insurance company and the insurance department. The original theory underlying existing Schedules P is that for the more mature but unliquidated claims the present values can be determined with reasonable accuracy on an individual claim basis, as in Compensation, or on an average suit value basis, as in Liability; that for more recent or unmatured claims the reserve should equal the aggregate ultimate incurred losses and loss expenses, less the amounts paid thereon to date. The aggregate ultimate losses and loss expenses are determined as arbitrary percentages of earned premiums, the percentages conforming approximately to the provisions in the rates for these items.

It was later recognized that such formulae did not provide adequate reserves in the case of a company whose average suit values were in excess of the prescribed values or whose loss ratio experience ran in excess of the reserve loss ratio. Accordingly, a case basis reserve test was incorporated in both parts of Schedule P. If the case basis produces a larger reserve, such reserve must be carried. However, it is quite obvious that if the case basis produces the larger reserve, the reserve is inadequate if it does not include a reserve for loss expense, which the formula reserve contemplates. Also, even if the formula reserve produces the larger reserve, the reserve may still be inadequate, since the difference or "equity" may not be sufficient to provide a proper reserve for loss expense. Further, the case basis reserve may in itself be inadequate, because of immaturity of claims and the consequent difficulty of their accurate or even approximate valuation, or the reserves may be designedly inadequate.

It is not my purpose to discuss the case where reserves have been deliberately falsified. Only eternal vigilance and frequent and exhaustive examination of the company by the insurance department of the state of domicile or "Convention" examinations by several insurance departments can adequately deal with such cases.

The writer had the privilege of assisting in the work of the Special Committee on Compensation and Liability Loss Reserves of this Society, which presented a report at the November 21, 1930 meeting (See *Proceedings*, Vol. XVII, Part 1, Pages 137-145), which recommended five fundamental principles respecting Liability and Compensation loss reserves, as follows:

1. The loss reserve should be based solely upon claims (and medical) excluding loss expense.
2. The loss reserves should be based upon individual estimates of outstanding claims (and units).
3. A minimum reserve based upon a pure loss ratio check should be applied for losses under policies issued in the three latest policy years.
4. A reserve for loss expense (both allocated and unallocated), to be determined by formula, should be set up on the "Liabilities" page of the annual statement.
5. Schedules or exhibits showing the development of the aggregate loss reserves (each line of business separate, but for all policy years combined) for a period of five years should be incorporated in the statement.

The report in question was given little publicity outside of our *Proceedings* and apparently made no impression upon state supervisory officials until 1934, when new Schedule P, Parts 5 (Liability, Auto and Other Combined) and 5A (Compensation) embracing in substance principle No. 5 above were incorporated in the annual statement.

These exhibits should be of value both to state insurance departments and to the companies in checking the adequacy of loss reserves. For its own benefit, a company should know whether its aggregate Compensation and Liability loss reserves are adequate, so that if inadequate it can make up the deficiency by the application of factors to the respective policy years' incurred or outstanding losses, by the addition of specific amounts, or otherwise; basing the factors or amounts on a comparison of projected ultimate loss ratios with indicated loss ratios (a prospective method), or upon the past record of reserve deficiencies (a retrospective method).

It has been pointed out, and is of course perfectly obvious, that if case basis reserves are in excess of formula reserves and no reserves are carried for loss expense, or if case basis reserves are less than formula reserves but the difference or "equity" is in-

sufficient to produce a proper reserve for loss expense, the aggregate reserves are inadequate. Further, as indicated by Mr. Lange, the writing of business at less than manual rates tends to produce inadequate loss reserves. It is the belief of the writer that reserves for the Compensation and Liability lines should be computed on both the formulae bases and upon the case basis, including an adequate reserve in the latter case for loss expense. The aggregate reserves for both lines combined should be compared on both bases and the larger aggregate incorporated in Page 5 of the annual statement. This plan has been followed for several years by the company with which the writer is associated. The plan as followed also provides for setting up separate liabilities for loss expense, which is consistent with the practice followed for the other lines of insurance.

MR. RUSSELL O. HOOKER :

Mr. Lange's valuable paper focuses our attention upon a matter of importance to the future solvency and welfare of casualty insurance companies. The problem of adequate liabilities, while as important to solvency as that of asset valuation, is capable of less immediate and exact treatment; hence, perhaps, the lack of adequate attention to this subject in the past. The value of the assets listed in an annual statement can, in general, be determined immediately; that of the liabilities, however, must remain little more than a guess for some time, although knowledge of the experience and practices of a particular company may offer some clue to the answer.

This necessary delay in determining the adequacy of liabilities applies especially to the Schedule P reserves. Given two consecutive annual statements, it has heretofore been impossible to trace completely their development from one year-end to the next, due to the necessary exclusion of data for the last policy year. This defect will be remedied to a certain extent by the new Parts 5 and 5A, which split the policy years into years of incurred loss and provide for the development of incurred liability and compensation losses, and that of allocated loss expense if included in the case estimates.

The author cites, for purposes of illustration, an instance of inadequate Schedule P reserves in the 1930 statement of a com-

pany which was relicensed by 47 states in 1931 and placed in receivership early in 1933. It is incorrect to suppose that this situation was entirely lost on the insurance departments that relicensed the company in 1931. The same condition existed in several other institutions which were correctly judged able to survive the depression. Adequacy of reserves is but one of the factors (albeit an important one) to be considered in determining whether a company should be relicensed.

The blame for any chronic under-reserved condition should be assessed on that insurance department which examines the company periodically, rather than on the departments of other states which must annually determine whether to relicense such company or, by refusing to do so, injure it and perhaps the business generally. The other states where the company operates should be able to rely on the thoroughness and accuracy of the regular periodic examinations made by the home state department. Such examinations should, but do not always, include a revision of all claim reserves made six or nine months after the statement date. The original reserve set up should be corrected in the light of the development over that period, including any necessary changes in outstanding case estimates as determined by review of a substantial number of open claim files. The examination reports of one department indicate that it makes an upward adjustment of the percentage factors used in computing the formula reserves, if indicated by the company's past experience, and adds provision for unallocated loss expense where the company has failed to include the same. Careful determination of Schedule P and other loss reserves along the lines here indicated is a vitally important part of examination procedure, as it gears the company up to the point of maintaining adequate reserves of its own accord. Of course most companies seriously endeavor to do this in any case; however, experience has shown that weak departmental examinations may cause trouble in this respect.

The experience of the past few years has thrown some light on the terminal results of habitual liability undervaluation. Such a condition in itself is not immediately fatal to a company; the day of reckoning may be long deferred if premium volume is maintained and other factors are favorable. When the inevitable business depression is encountered, however, and current income is no longer sufficient to pay claims, the under-reserved company

may find itself severely handicapped as a going concern and in need of immediate and substantial assistance in order to survive.

Should the construction of Schedule P prove, as the author says, of more interest than that of the other loss reserve schedules, this fact must be due to its complexity rather than to any superior scientific merit. A brief review of what appear to be some of the more serious flaws in this schedule is as follows:

1. The statutory 60% and 65% factors in Parts 1 and 2, respectively, are too low for some companies, especially those writing at cut rates. These factors should in some manner be varied to fit the company's past experience or, as the author remarks, the use of the "voluntary" additional reserve column should be *required* to bring the formula reserve for the last period into line with such experience.

2. There seems to be a lack of uniformity between companies in making up the case basis estimates. Most companies provide here for allocated loss expense, although some do not. The practice as to setting up a figure for incurred but unreported losses varies also. No liability for future unallocated loss expense payments is customarily included, although this point is of some financial importance. Insofar as the case basis estimates are the alternative to the formula reserve, they should certainly cover the same ground as the formula, which of course is supposed to provide for future losses and claim expenses, whether allocated or unallocated.

3. The total of the unallocated claim expense payments for which credit may be taken should be limited by some maximum percentage of loss payments, or at least some standard method be laid down for the computation of such expense payments. This opinion is of course based on the fact that such disbursements for the last period enter into the determination of the formula reserve.

4. The statutory liability suit limits are out of line with the trend toward higher verdicts in recent years; formerly plenty of "equity" was hidden in the suit reserve column, but the reverse is more generally the case today. Also, some definite instruction should be placed in the schedule as to which cases should be included in the suit reserve column. Furthermore, the door should be closed to the possibility of valuing a suit brought jointly by

several injured persons by applying the statutory amount for a single suit.

5. The practice of discounting future compensation payments at 4% is out of line with the current rate of interest earnings, and this condition may hold for some time to come.

There are other criticisms which might be leveled against these schedules, and there will doubtless be some difference of opinion as to the views herein expressed. The timely presentation of this paper would seem to offer a favorable opportunity for such further study into this subject as might result in the recommendation of valuable technical improvements in Schedule P, as well as in state laws with respect thereto.

COMPENSATION EXPENSES PER POLICY—HARMON T. BARBER

VOLUME XXI, PAGE 65

WRITTEN DISCUSSION

MR. GRADY H. HIPPI:

Mr. Barber's paper on Compensation Expenses per Policy contains an interesting and worthwhile contribution to the study of expenses, a subject which undoubtedly will increase in importance in the near future. The discussion in his paper is largely based upon an analysis of the combined returns of countrywide compensation figures compiled by the Pennsylvania Compensation Rating and Inspection Bureau in 1934. The returns were filed in response to a Special Pennsylvania call for incurred expenses.

The writer is connected with a carrier which does not transact business in Pennsylvania and which accordingly was not called upon to file a special expense return. Consequently, the writer does not have first-hand knowledge of the actual details in connection with filing and compilation of the special expense data.

Mr. Barber refers to the special call as outlining a standard method for treating overhead expense and expense items less susceptible to definite allocation. His statement is perhaps too strong inasmuch as "special investigation" is the suggested basis of allocation of a large majority of the items. Such a suggested basis not only permits departure from a standard procedure, but of necessity makes it inevitable.

Mr. Barber recognizes certain weaknesses in the Pennsylvania study of expenses which probably cannot be entirely eliminated

in any future study. The pro-rating of total administration expenses in accordance with earned premiums by lines of business is a weakness of considerable importance. It may well be that an analysis of the returns of the carrier or carriers which limit their writings entirely or largely to compensation business would offer a partial answer to the above criticism.

By far the greater part of the expenses allocated on a per policy basis was in connection with items for which the special expense call suggested "special investigation." The allocation of salaries of units with limited functions was largely made on the basis of special investigations. The allocation of salaries of general service and supervision was made on the basis of percentages calculated from the allocation referred to in the preceding sentence. The allocation of payroll audit salaries and expenses was made almost entirely on the basis of special investigations.

While I do not know to what extent the individual carriers followed the suggested bases, the procedure undoubtedly resulted in the individual judgment of the carriers playing a large part in the allocation of expenses. It must be recognized, however, that by calling for the allocation of expenses under a large number of specified items, errors of judgment probably were offsetting to a considerable extent.

The table of comparative average expenses per policy for participating and nonparticipating carriers shows very interesting results. It is, no doubt, also true a study of the differences in returns of individual carriers would produce enlightening information. If the variations in returns of individual carriers are not too great, the credibility of the combined returns is considerably enhanced.

A consensus of the views of the carriers (which filed returns under the special expense call) as to desirable improvements in the form of the call should reveal constructive suggestions.

It is generally recognized that there are certain items of expense per policy which do not vary with the size of the premium. The Pennsylvania study of expenses undoubtedly is the most constructive one thus far made.

There can be little, if any, disagreement with Mr. Barber's conclusion that every risk should be charged with an expense constant as a part of its contribution towards the expense of administration, payroll audit and possibly inspection.

The expense constants suggested by Mr. Barber probably will require changes in the future. However, until such time as further studies may indicate the need for changes, such constants must be accepted as the most reasonable figures now available.

COMMENT ON THE UNDERWRITING OF COMPENSATION
FOR SILICOSIS—ROBERT V. SINNOTT

VOLUME XXI, PAGE 59

WRITTEN DISCUSSION

MR. WILLIAM N. MAGOUN:

Mr. Sinnott concludes his "Comment on the Underwriting of Compensation for Silicosis" with the optimistic statement that "perhaps it will not be the unsolvable problem it is expected to be." The solution of any difficult problem must rely upon an incentive to find the answer, combined with a willingness to devote as much time as may be needed for a thorough study and discussion of all available data bearing on the question. Neither of these two essential elements is lacking in the present instance, as there always exists the incentive for good underwriting practice, and already the insurance companies have demonstrated a willingness to attack the silicosis problem.

My discussion of Mr. Sinnott's paper will be confined to this phase of the situation, namely the setting forth of certain points bearing upon the problem of underwriting risks having employees exposed to the hazard of silicosis.

The foundry industry is a typical illustration. We have risks which are foundries and nothing else, where all the employees are exposed to the dust hazard resulting from the use of sand; and we have other risks where the foundry is only an incidental operation, the principal operation being of a wholly different character, such as a machine shop.

Since December 1, 1933, there has been in effect in Massachusetts a supplementary occupational disease rate of \$2.00 per \$100, applicable to the payroll of all employees exposed to a foundry hazard in any risk, however classified. While this rate is not exactly equivalent to a per capita basis as suggested by Mr. Sinnott, it is a wholly segregated charge for the specific occupa-

tional disease hazard involved, and is separately stated in the policy and treated independently for statistical purposes.

The New England Foundrymen's Association has urged the adoption of some workable system under which this supplementary occupational disease rate may be adjusted to reflect the difference between the foundry which is ready to improve and maintain plant conditions justifying a reduction in the charge, and the foundry which is not willing to do so. In other words, the foundrymen ask for what Mr. Sinnott suggests might be desirable, "a schedule credit scheme for the rating of individual risks." To the accomplishment of this end, the insurance company representatives have devoted considerable time and thought, and have produced an Occupational Disease Schedule Rating Plan.

In addition to such rules as pertain to "Applicability," "Surveys" and "Costs" which are inherent in any such instrument, the plan provides for physical Standards, Dust Count Survey Requirements and Rules for the assignment of risks to one of six classes with charges or credits according to such class assignment. The dust particle count which must be made in accordance with an approved technique and must include samples taken in the operations specified, in order to show representative conditions throughout complete cycles of dusty operations, is an important feature of the plan.

Observance of the physical Standards is important, and may be expected to so control the dust as to bring the dust count within a safe range. In the last analysis, however, it is the quantity of dust particles in the normal breathing zone of the workmen, which really measures the condition of the plant from the standpoint of the silicosis hazard presented.

Recognizing that in some plants, although the Standards may be observed, the dust count still remains too high for safety, and in other plants the dust counts may be within the accepted range of safety even though not all of the Standards are fully complied with, the plan, through the assignment of individual risks to one of the six classes referred to, attempts to do justice under all the varying conditions to be encountered.

The rule of the plan covering the above is as follows:

All risks surveyed shall be assigned to the proper class according to the results of the survey with respect to compliance with Standards, and the Dust Count reported, as follows:

Risks Complying with All Standards	Risks NOT Complying with All Standards	Dust Particles Less than 10 Microns in Size per cu. ft. of Air
Class A	Class D	All Dust Counts under 10,000,000
Class B	Class E	Any Dust Count 10,000,000 or over but none over 20,000,000
Class C	Class F	Any Dust Count over 20,000,000

Rate modifications are provided by classes as follows:

Class A Credit "V"	Class D Credit
Class B neither Credit nor Charge	Class E Charge
Class C Charge "V"	Class F Charge

In establishing the value of "V" as 40% of the supplementary occupational disease rate (40% of \$2.00 = .80) as proposed in Massachusetts, the plan does not conform to Mr. Sinnott's statement that "due to the uncontrollable development of silicosis, credit can be given only where no evidence of the disease is present," which would be the case if the entire supplementary occupational disease rate was subject to removal. Rather, the plan recognizes that while 60% of the supplementary occupational disease rate must be retained in all cases to provide for accumulated silicosis cases which the plan cannot reach, through the requirement that new foundry workers may be employed only after passing acceptable physical examination including X-rays of the chest, it is feasible to allow a credit up to the remaining 40% of the supplementary occupational disease rate, where all requirements of the plan are met, with lesser credits or charges for risks falling in the other prescribed classes.

Boston, May 11, 1935.

W. N. MAGOUN.

MR. F. ROBERTSON JONES:

My comments on this paper are as follows:

A primary difficulty in discussing this problem is that we know so little about silicosis. It seems to me that Mr. Sinnott starts by assuming that we have more definite knowledge of the subject

than the facts warrant and thereby tends to simplify the problem unduly.

First: In introducing his comments, Mr. Sinnott treats silicosis as a disease caused only by silica dust (SiO_2). In medicine, that is now the prevailing theory; but it is not universally accepted. And in law, we are heading for broader definitions, not to mention coverage of other related diseases such as asbestosis, anthrasilicosis, etc., of dust diseases generally, or of "occupational diseases" indefinitely. Doubtless the formulation of a practicable plan of underwriting compensation for silicosis, most strictly defined, is the crux of our problem, and its solution may be expected to provide a basis for variations to fit other associated diseases. But in such comments as Mr. Sinnott's, I think that it should be more distinctly indicated that we are facing the probability of mutable definitions not merely in the laws, but also in medicine.

Second: Mr. Sinnott assumes that silicosis "may be definitely diagnosed by an X-ray study." My advice is to the contrary. In Great Britain, I am informed, the prevailing opinion is that diagnosis is nearly always uncertain short of a *post mortem*, and that diagnosis on claims for disablement are merely expert opinions as to probabilities, in other words, inferences from case histories. In practice this means that the loss cost of disability cases may vary immensely according to the character of the administration, the rules of proof, the period of exposure required, etc. Mr. Sinnott notes that the rating problem will be complicated by the probability of a progressive increase in the scale of benefits. In my opinion, even more to be feared is a progressive liberalization in administration, in the rules of proof, etc.

Third: Mr. Sinnott avers that silicosis, once contracted, is inevitably progressive. That may be true of silicosis, strictly defined, after it reaches a definite stage. But it is more than questionable about pre-primary silicosis; and it would surely not be true in all cases of false diagnosis of silicosis—of which a multitude may be expected. Therefore, Mr. Sinnott's deduction that there will be no *temporary* disability cases seems to me to be greatly in error.

Coming now to the gist of Mr. Sinnott's suggestions:

I think that we must reject any idea of rate making based upon a *legal* apportionment of liability among successive employers and insurers. There are lengthy pros and cons; but the

only practical conclusion is that we must face the problem of making rates based upon the proposition that the entire liability will fall on the employer and insurance carrier as of the time of the last exposure or last injurious exposure. This conclusion tends to bar some phases of Mr. Sinnott's suggestions.

Then, I think that rates will have to be made in advance of experience. There has been some experience in Wisconsin and Massachusetts and there is some more impending in California. But such experience has all been abnormal and has turned largely upon the peculiar law conditions in each of such States respectively. The underwriting problems impending in North Carolina, New York and possibly Illinois and Missouri are so radically different as to leave us without any really relevant experience data to go by. Consequently Mr. Sinnott's suggested formula for rate making, however sound it may be for future application, when experience shall have been accumulated, is of no help in the present emergency.

However, that leaves what I appraise to be Mr. Sinnott's basic proposition, namely that the "subjects" or "risks" to be rated for insurance against silicosis must be the individual workmen and not the plant with its workmen indiscriminately. With that proposition I am in hearty accord. And it seems to me that this proposition has immediate application. At the start, under any law newly imposing liability for silicosis regardless of fault, the charge for insurance coverage of such liability must be fixed according to formulas entirely different from those which are being followed in accident compensation rating. This presents a problem as to which I am in the dark, and, as a child, am crying for the light.

May 10, 1935.

F. ROBERTSON JONES.

AUTHOR'S REVIEW OF DISCUSSIONS

MR. ROBERT V. SINNOTT:

I wish first to thank Mr. Jones and Mr. Magoun for their comments on my paper on underwriting for silicosis. Naturally, we are now handicapped by the lack of adequate legal and medical definitions of silicosis. Both professions are working their ways

forward toward solutions which we hope will clear the air. However, regardless of the blurred outlines, industry, our courts and legislative bodies have recognized that such a disease exists, that its effects run counter to social welfare and that something must be done about it. The well tried panacea of insurance has been applied or will be shortly and the problem is in the hands of the sorely tried insurance carriers. We must perforce make our own definitions through medical research and through the carrying of such results attained into the courts for their baptism of legal fire.

Suppose for the present, however, we start with the physical impairment that results from silicosis. If a man who has been exposed to a dust hazard, exhibits the known symptoms of silicosis and becomes so inefficient in his work through his physical inability to perform assigned tasks that his employer finds it more economical to replace him, then this old worker has suffered a loss of earning capacity and his claim of disability arising out of silicosis will be honored beyond a doubt. Of course, we will have border line cases and cases of malingering. We have them now in industrial accident compensation, but their effect has not been totally to vitiate the entire system.

I believe the point of the economy for the employer of keeping on old employees should be emphasized. If through charging excess premiums for old exposures regardless of the physical condition of employees, we make it more costly for the employer to retain his old employees, we are going to force many of these older men out of work. Since they are out of work and since they have been exposed to a hazard of silicosis, it may reasonably be expected that they will make claim. Our recent experience will tend to make us believe that such claims will be honored. Definite medical diagnosis may be difficult but the fact that the man has suffered a loss of earning power through an exposure to silicosis will operate in his favor. This will certainly be the case where we lack clear-cut medical and legal definitions of silicosis. If we force disability in this fashion we are forcing also liberalization of administration and we will not be altogether blameless for our own grief.

I agree that there may be no legal apportionment of liability among successive employers. It does not seem probable that legislatures would permit a condition to exist where a claimant of

the usual type must pursue his award against possibly a dozen different carriers. One must be responsible, probably the one of last record. However, there is nothing to prevent other companies which have carried the risk during the subject's exposure from contributing to the award either through a pool or through a mutual reinsurance agreement.

Now, as for rates. Certainly we may anticipate vast difficulty. The path of exposure (either men, years, or man years or payroll) and actual dollars of loss is cluttered with stumps. Awards differ between states; awards have been out of proportion. Payroll is difficult or impossible to obtain if we attempt to underwrite the individual subject. I do not feel that it is improbable, however, that the companies may have in their own claim files case histories enough to produce tables perhaps raw and uneven, but perhaps reliable enough for a start; to show the probable duration of time between first exposure and ultimate disability and to make charge accordingly.

Schedule rating plans are necessary in the present stage of silicosis insurance. Preventive measures must be pushed by the companies in self-defense and in the interests of humanity. They have no bearing, however, on the total costs to the carriers since all such plans are supposed to be in balance. The important thing it would seem is the basic manual rate. However, it seems illogical to the writer to establish deviations from a rate before the rate itself is satisfactorily established.

If we are underwriting on a per capita basis and are allowing credits for prevention apparatus, should we allow this credit on the premium charge for a man who already has silicosis? The prevention apparatus has no effect on his condition. The damage has been done. The same observation is valid in connection with any experience rating plan—if we apply credits on the theory that the number of cases in the past is closely correlated with the number of cases in the future because the employer will continue to exercise preventive control and because employees are careful. We know or at least we should know, how long we have to collect money enough to pay his final disability benefit. We should proceed to do this after the manner of life assurance.

At this stage of disability I see little fundamental difference between our own operation and that of a life insurance company.

“THE EXPERIENCE RATING PLAN AS APPLIED TO WORKMEN’S
COMPENSATION RISKS”—MARK KORMES

VOLUME XXI, PAGE 81

WRITTEN DISCUSSION

MR. NELS M. VALERIUS:

It is perhaps early to review Mr. Kormes’ paper before both parts have been presented, but the following discussion is directed to the history of *the experience rating plan as applied to workmen’s compensation risks*, which is included in the first part.

Mr. Kormes has presented a comprehensive paper on a subject rather neglected in the *Proceedings*. It was to be desired that someone well acquainted with the theory and practice of experience rating, as is Mr. Kormes, should present such a paper.

The history of experience rating plans in compensation is almost exactly coextensive with the history of this Society and members had a very large part in molding the plans from their beginnings to the comparatively stable forms of the present. Nevertheless, a complete story of the development or indeed a statement of the status at any one time in all rating jurisdictions cannot be gleaned from the *Proceedings*, if we except May, 1916, when Mr. Woodward outlined the status in a paper on experience rating.

EARLY PLANS

I shall use the headings of the paper for convenience of reference.

Under the heading *Early Plans*, Mr. Kormes has described very briefly the plans originating before 1918. The plans in mind were presumably the National Workmen’s Compensation Service Bureau’s Plans A and B (also C, the employer’s liability plan) the Compensation Inspection Rating Board’s (New York) 1915 and 1916 plans, and the Massachusetts Rating and Inspection Bureau’s 1916 plan, the plans numbered I, II, III, VI, VII, and XIV, respectively, in Appendix I of the paper. There were, no doubt, other plans of experience rating proposed for compensation and at least one more in official operation. Mr. Woodward,

in the paper mentioned, described a plan used in the state monopoly of Ohio, which was different from the present one in Ohio described by Mr. Kormes. In the discussion of that paper, in October, 1916, Vol. III, Pages 54-57, Dr. Downey described a Pennsylvania plan which determined the modification of manual rate on the basis of the hazard of the more common accidents alone (later amended to include death at a low value) and contained "an ingenious device" whereby the plan would always be in balance so that the total premium foregone on credit risks would be equalled by the extra premium for debit risks. The plan was retrospective and the credits and debits were dependent on the risks' deviations from the realized loss ratio of the whole business in the state, whereby the balance could be achieved. This plan was finally rejected soon after, without becoming operative. Another proposal by Mr. David S. Beyer contemplated experience rating on the basis of accident frequency.

The brief description (Pages 83 and 84) fits best the 1916 or "A" type plans, those of the Service Bureau, New York, and Massachusetts (I, VII, and XIV of the Appendix). By reference to the synopsis on Page 116, it will be seen that the Service Bureau's second or "B" plan, while otherwise following the "A" form closely, deviates in its determination of the modification for the hazard of Fatal and Permanent Total losses, so that the remarks under (c) *Neutral Zone* and (d) *Credits and Debits* do not apply to that part of the plan.

Mr. Kormes has made an exception for the New York 1915 plan under (c) *Neutral Zone*. Since it had no neutral zone, the remarks under (d) *Credits and Debits* do not apply either. The debits and credits were, however, determined as first degree functions of the loss ratio in this plan also, in fact they were read from straight line graphs (reproduced in Vol. I, Pages 236-238).

It is interesting that this first New York plan, in effect soon after the inception of workmen's compensation, provided for using employers' liability experience, the data reported being the number of injuries by kind and the payroll. It seems to be the first formal plan of experience rating in the field although risk experience had been used before to justify special rates.

Under the heading (a) *Experience Period*, Page 83, one exception might be noted. The New York 1916 plan set no maximum limit to the experience period. This did not become a practical

difference, however, since the printed plan contained not only its effective date but also its date of expiring, six months thence, which precluded the use of much more than the minimum experience. (After this trial period, approval was extended six months more). Other early plans were similarly approved for definite periods, in contrast to the usual practice of making rules effective indefinitely from some date on.

Under the heading (b) *Qualifications*, Mr. Kormes says all the plans had some minimum size requirement as to payroll, premium, or both, developed during the experience period. I do not know of a plan at that time that had a premium requirement only, and I believe this reflects a prevalent impression that the number of lives exposed was the most important credibility or qualification criterion. In the discussion evoked by the paper of Mr. Woodward, Mr. Senior stated that the New York 1916 plan's requirement (and the Service Bureau plan was almost identical) contemplated 100 man-years as the qualifying point. Presumably this referred to the manufacturing risk payroll requirement of \$100,000; the requirement of only \$50,000 for contracting risks must have been in part a recognition of the greater accident hazard, though probably also in part a concession for the absence of schedule rating.

Under the heading (d) *Credits and Debits*, Page 84, r , the actual risk loss ratio must be understood to be less than r_1 for formula (1) to be applicable and to be greater than r_2 but less than 100 for formula (2) to be applicable. For loss ratios of 100% and over, the maximum debit applies. In the Massachusetts 1916 plan (Page 124, Volume XIV) the formulas are not immediately recognizable; the debit formula is only approximated by a slightly simpler form.

A question presents itself about the Massachusetts plan: How was $4/7$ hit upon as the appropriate fraction of the sum of analytic and experience modifications to be effective?

Without exception, the plans of this period have been well described in the following words: "These were empirical expressions of underwriters' judgment and did not rest upon any reasoned analysis according to the laws of probabilities." Nevertheless, they had a fair amount of unity in the range of the modifications produced for, say, a risk of \$1,000 annual premium, particularly if the addition of schedule rating in the modification of manu-

facturing risks were considered to offset the greater swing of the experience plan for non-schedule rated risks.

An important event of this period was the hearing before the New York Insurance Department on experience rating in 1916. Optional application of experience rating was not provided in any plan thereafter, but it is probable that latitude continued in the less regulated states for some time. In 1917 the New York Insurance Department withdrew approval of experience rating, which action brought to a head the unsatisfactory situation and led to the fundamental investigation of 1918 and establishment of the theory of experience rating.

1918 PLAN AND THE BASIC PRINCIPLE OF EXPERIENCE RATING

As Mr. Kormes has stated, the 1918 plans or "D" type reflect thorough consideration of the subject by leading actuaries in the light of theoretical and practical considerations, and the heading of this section emphasizes the fact that the mathematical forms then evolved remain the basic principle. The statement in the plan presenting the new theory in contrast to the old may therefore be quoted:

"The charges and credits under the Plan result from the application of the theory of probabilities to the comparative evidence of the classification experience and the individual risk experience. There are no maximum debits or credits; there is no neutral zone, nor does the Plan involve the use of loss ratios. These elements have been superseded by a new formula for experience rating, which automatically graduates the debits and credits in accordance with the size of the exposure and the degree of hazard represented by the risk experience."

The footnote on Page 85 credits this investigation and the resultant plan to the "National Council Reference Committee". It was the National Reference Committee on Workmen's Compensation Insurance, representing the types of carriers and operating under the combined auspices of Insurance Departments and Rating Bureaus; the National Council had not yet been formed.

The "D" type plans are numbered IV, VIII, XV, and XIX in the Appendix.

It should perhaps be said parenthetically that the rating plans applying in the territories of certain administrative boards and

bureaus at a given time have at least a general likeness because of cooperative accord existing. The independent bureaus and boards cooperating with the National Workmen's Compensation Service Bureau in 1918 in the matter of experience rating were Massachusetts, New Jersey, and New York. Later bureaus of California, Minnesota, Virginia, Wisconsin, and the Texas Commission have cooperated with the Service Bureau and its successor in compensation rating, the National Council on Compensation Insurance. In several of the states concerned, the National plans have been used with exceptions inserted. The Pennsylvania and Delaware bureaus, practically identical, allowed the "B" plan in their territory but have otherwise been independent. The state monopolies have always been independent.

To return to the 1918 plan: among the reasons cited on Page 84 as provoking the new plan is the statement, "Small risks, where there were no losses or very small losses, received credits although the occurrence of a loss was hardly expected in connection with any particular risk having such small exposure." This statement seems rather strong as applied to the immediate predecessors of the "D" type plans, since the premium qualification was not greatly changed with that plan. The objection was perhaps not so much to the small size of the risk as to the range of the modifications on small risks. In fact, it was stated that a minimum size was specified in the new plan only as an administrative provision to avoid rating the smallest risks, whose modifications would be unimportant under the new plan of graduated credibility.

On Page 87 the New York Table "A" is reproduced. The second column would better be headed "Indemnity" than "All Other and D. & P. T. D.". The New York Plan, after defining "All Other" to mean medical losses and indemnity losses except Death and Permanent Total Disability indemnity, erred in using "All Other" in this one place in the sense of indemnity other than D. & P. T. D.

On Page 88 the treatment of special catastrophe elements in rates is mentioned. Not only New York but also the other cooperating states, Massachusetts and New Jersey, set aside the catastrophe element in rating and added it back unmodified to the modified ex-catastrophe portion at the end, which procedure was later adopted for the National plan 1920 (Page 89). A simi-

lar procedure is at the present time being proposed with respect to occupational disease elements. The statement is made that New York, after March 5, 1919, excluded the Table "C" classes. These were again rated under the previous rule starting April 18, 1921, and remained in New York plans until December 1, 1934.

THE ORGANIZATION OF THE NATIONAL COUNCIL ON COMPENSATION INSURANCE AND THE 1920 EXPERIENCE RATING PLAN

Synopses of the National Council plans are not given in the Appendix, hence the only plans listed there which are related to this heading are IX and XI, the New York and California plans. I consider, however, that the first California plan is better described as a "D" type plan. Massachusetts and New Jersey this time used the National Council plan with special rules and exceptions inserted.

Under (d) on Page 89, Mr. Kormes states that self-rating was not adopted in many important states. I believe the rule was adopted in all the states where the "Industrial Experience Rating Plan—1920" or a similar plan was adopted except New York. Massachusetts set \$120,000 and New Jersey \$100,000 subject premium as the self-rating point rather than \$80,000. Pennsylvania's plans included self-rating provisions since 1919.

The 1920 plan developed a defect in practice in that small risks were given heavy charges from the presence of single costly injuries in the experience, and a rule was adopted in certain states but never appeared in the manual that the amount of loss used be limited so that no single case should have over 20% effect on rate.

The following brief, December 17, 1920, of the California Inspection Rating Bureau's Rating Committee for their proposed plan is of interest because of the comments on contemporary plans:

MEMORANDUM RE: PROPOSED EXPERIENCE RATING PLAN FOR CALIFORNIA.

In accordance with the resolution adopted by the Bureau, the Classification and Rating Committee undertook the preparation of an experience rating plan for California. The Committee had before it similar plans in use in the States of New York and Pennsylvania, as well as the plan adopted by the National Council and recommended for use in California.

The National Council plan is substantially the former Plan "D" of the National Workmen's Compensation Service Bureau. The two main differences being, first, the introduction of an additional constant in the numerator and denominator of the formula for determining the credibility factor for the "All Other" portion of the premiums. This modification of the formula has a tendency to increase the credibility of the experience of small risks, allowing greater credits or debits for good or bad experience. Second, the introduction of an arbitrary stop limit beyond which the experience rate is not obtained by formula, but is determined by loading the actual risk losses for expense.

The New York plan follows that of the National Council in principle, and differs materially in only one respect, namely, there is no automatic stop limit and the formula treatment continues irrespective of the size of the risk.

The Pennsylvania plan is materially different from the plan of the National Council. It is what is known as a "no-split" plan, in that there is no division of the premium or losses between death and permanent disability on the one hand, and "all other" on the other. Further, the Pennsylvania plan excludes the entire experience of the policy year preceding the one for which experience rates are promulgated, and requires the valuation of indeterminate cases to be made by application thereto of a table of values for such cases. The Pennsylvania plan is like the National Council plan in providing an automatic stop limit beyond which the rates are based entirely upon the experience of the individual risk.

The plan recommended by the Classification and Rating Committee follows in principle the plan recommended by the National Council. It is a "split" plan, although there has been added to the death and permanent disability division of the split other permanent disabilities rated at 70% or more. This addition has been made on the theory that such cases are just as infrequent and of as great severity as the deaths and permanent total disabilities. The division of the premium into two parts is made for the purpose of minimizing the effect of shock losses upon the rates of an individual risk. The Committee believes that this result is better accomplished by treating pension cases as shock losses.

The Committee has not adopted the modified formula of the National Council for determining the "all other" credibility factor but has adopted instead the formula of plan "D", which was the predecessor of the Council plan. This action was taken because the formula of the Council violates the mathematical theory underlying experience rating, which was developed by Professor Whitney. It arbitrarily increases the credibility of the experience of small risks, which, in the judgment of the Committee is unjustifiable.

The recommended plan does not contain an automatic stop limit, because, again, this is contrary to the theory upon which the plan is applied to small risks. To say that the rates for a risk of given size should be made entirely upon their own experience is to deny the correctness of the formula and to question the soundness of experience rating.

The Committee adopted the feature of the Pennsylvania plan, which excludes experience for the policy year preceding the one for which the experience rate is promulgated, for several reasons. In the first place, this action obviated the necessity of a payroll audit within the policy term. In the second place, it permitted a longer development of the loss experience, thus rendering that element in experience rating more dependable. Lastly, it permitted the Bureau more time in which to secure information for experience rating purposes, and in which to promulgate the rate. It seemed highly desirable that experience rates should be promulgated in advance of renewal, and realizing the magnitude of the task before the Bureau, the Committee felt that this was perhaps the most important reason for excluding the experience of the current policy period.

The Committee adopted the plan followed in Pennsylvania and New Jersey of requiring open cases to be valued according to an indeterminate table, because it was realized that any method based upon estimates of outstanding losses would involve the personal equation and would not be satisfactory.

The constants which are used in the formulas for experience rating are higher than recommended by the National Council, because after tests made by the Insurance Department they seemed to give the proper maximum credit departures for both large and small risks qualifying under the plan.

The experience period was set at three years, because it was felt that experience prior to policy year 1917 would not be indicative of present day conditions.

The minimum qualification for experience rating was set at \$1,500.00 for the experience period with provision that at least one year's experience must be available. This qualification was determined after consideration of the number of risks which would have to be experience rated, as well as the probable results of applying the plan to smaller risks. (\$1,000 was finally selected as the qualifying premium - note.)

While the recommended plan is obviously not the plan proposed by the National Council, it follows the principle of that plan, the variations being primarily intended to make it workable under California conditions, particularly those which will be experienced upon the introduction of a new system of rating. The Committee felt that the actual use of the plan would indicate whether or not it was desirable to follow more closely the plan of the National Council, but that prior to such actual use the recommended plan would be more satisfactory.

1923 PLAN — 1928 PLAN — PRESENT PLAN

The 1923 and 1928 plans of National Council and cooperating states revert to the 1918 plan in mathematical form with one important practical change, the division of losses, "split," is not by kind (D. P. T. and Other) but on a deductible average basis (Normal and Excess). This has the effect of discounting every loss of major size, including medical, and not only D. and P. T. indemnity as formerly. Another important and related feature is the limitation in size of single losses and the calculation of K values in such a way as to incorporate automatically the limitation of the effect of a single maximum value loss to 20% for a risk of \$1,000 subject premium, replacing the stop loss rule.

The presentation of this section of Mr. Kormes' paper does not enable the reader to trace developments from 1923 or distinguish the two plans. This is no great defect to Mr. Kormes' purpose, however. A complete statement of the nature of the 1923 plan, its differences from its predecessor, and the considerations underlying the change can be found in Mr. Hobbs' "Report Relative to the National Council on Compensation Insurance made to the National Convention of Insurance Commissioners, April 14, 1924." The principal developments from that time can be followed in similar Reports made by Mr. Hobbs from time to time.

Pages 90-105 inclusive, are largely a paraphrase of the Council's present plan with statement of exceptions in the various states and do not invite much comment from the point of view of this discussion. Another practical difference between the 1920 and 1923 plans might be added to that on Page 98. The comparison of indicated and expected results is on a loss basis whereas previously it was on a premium basis. It was argued that the assured finds the final result more reasonable if he sees his losses (modified to latest basis, however), compared to expected losses than if an "indicated" premium is calculated by application of large factors to his losses and then not followed but allowed to be influenced by a "subject" premium.

OTHER STATES

This section is one of the most interesting features of the paper. The plans of the state monopolies have never been made available in one place before to my knowledge. They seem to be without exception not comparable in advancement to the plans devoted in rating bureaus through cooperation of private carriers. Probably the state monopolies have to be even more chary than private carriers of the appearance of discrimination which credibility may have.

In conclusion, I add a few comments on Appendix I and Chart I. It is not likely that either Mr. Kormes or the writer is correct in all statements that involve the many and short-lived details of so many plans. Moreover, some items, as effective date, have not had the same exact meaning throughout the time.

Page 115 I—Plan A

1. Experience Period: add "including 9 months of current policy."
5. Principle of Calculation: C. Maximum debit
20% for Schedule rated risks.
25% for Non-Schedule rated risks.

Page 117 III—Plan C

This was not the earliest Employer's Liability experience rating plan of the Service Bureau but perhaps the earliest printed

one. Inasmuch as it applied to New Hampshire compensation as well as liability experience, it is in order here.

Page 118 III—Plan C

Formula, top of page, should be $\frac{r-55}{45} \times 40\%$.

As in Plans A and B, the 40% maximum credit for combined schedule and experience rating applied.

Page 120 VI— Just above middle of page, under head "Over \$100,000 payroll," 85% should be substituted for 80%.

Page 121 VII—2. Qualification: Add "and public service" after contracting.

5. Principle of Calculation:

$$\text{Maximum Debit or Credit} = 5 + \frac{\text{Premium} - 500}{300}$$

Page 122 X—2. Qualification: Original qualification was \$1,340 premium at latest manual rates over experience period or \$335 average annual premium over last two years. These amounts were changed to \$1,500 and \$375 respectively January 1, 1925; to \$1,650 and \$825 (for sum of last two years) June 30, 1925; to \$1,600 and \$800 for two years on May 1, 1928; and to the present as given by Mr. Kormes on January 1, 1933.

Page 126 XIX—1. Experience Period: 3 months current policy not 4.

Page 127 XX—2. Qualification: It may be noted that the many changes represent an effort to keep experience rating in force upon the same body of risks despite changes of general wage and rate level. At 6-30-1935 the amounts become \$900 and \$450, respectively.

Nos. XVI and XXIII do not indicate separate plans as do other numbers.

Chart I—New Hampshire—Plan C to 8-1-1921

1920 Plan 8-1-1921 to 7-1-1924

(However, the 1920 plan was modified for New Hampshire use and is so changed as to be in effect another plan.)

New Jersey—7-4-1923, not 7-4-1924.

Ohio—Plan A applied 10-1-1916 to 8-1-1917 for private carriers.

Vermont—Transition from 1918 to 1920 Plan 2-1-1921 not 12-1-1920.

AUTHOR'S REVIEW OF DISCUSSION

MR. MARK KORMES:

The author is greatly indebted to Mr. Valerius for his painstaking review of the paper in which he has brought out many details not quite clearly set forth in the paper.

Mr. Valerius' discussion is particularly valuable from the historical point of view since he mainly refers to the early plans and has had access to material concerning such early plans not available to the author.

The contents of Appendix I and Chart I are based, as stated in the paper, on compilations made by the Aetna Life Insurance Company and a large portion of this work was carried on by Mr. Valerius over a considerable period of time so that the author gratefully accepts all additions to and modifications of the various statements concerning the early plans.

The author's broad characterization of the early plans in the main body of the paper was not intended to fit every single one of the early plans but to bring out the most characteristic features and principles which were in effect at one time or another in practically all of the states having experience rating.

The author appreciates particularly Mr. Valerius' corrections relative to the information contained in Appendix I and Chart I. The considerable amount of material and the limited time allotted for a check-up of typewritten text and galley proof account for some of the omissions and inaccuracies.

REVIEWS OF PUBLICATIONS

CLARENCE A. KULP, BOOK REVIEW EDITOR

The Essentials of Insurance Law. Edwin W. Patterson. McGraw-Hill Book Company, Inc., New York, 1935. Pp. 501.

Insurance law comprehends a spacious and very detailed field, a veritable welter of statutes and judicial decisions. Any attempt to extract therefrom the essentials is no mean task. The author devotes most of his space to the subject of "insurance contracts, their formation, their validity, their interpretation, their termination and their performance." The 11 chapters which deal with these topics do so in a manner admirably lucid; and the concise list of principles which concludes each chapter presents in a manner very easy to grasp certain fundamentals which every one who deals with insurance contracts would do well to learn.

So much may be said without reservation. I venture, however, a certain doubt as to whether the book is at all likely to fulfill the purposes set forth in the preface: to serve as a "manual of legal hygiene" and make lawyer's briefs unnecessary. No doubt as he states, those in charge of insurance enterprises make disastrous mistakes which result in court actions or in legislative crises, but it is not in many cases ignorance of the fundamentals of insurance law which is the cause. Most insurance men know enough of the leading principles of law applying to insurance contracts to transact a considerable volume of business without the help of a lawyer. A good part of these legal troubles come in branches of law with which they are not so familiar, and in many cases of legislation the trouble is not because of errors of the carriers with regard to the law but is the consequence of acts done in strict accordance with the law as it stands. The insurance executive takes as a rule a rather conservative view of economic and social matters and in these piping times of progress finds himself once in a while out of touch if not in active conflict with the modes of thought and of feeling prevalent in the somewhat hectic legislative atmosphere. It may be anticipated therefore that this book will not serve to cause cobwebs to accumulate on all the rest of an insurance lawyer's library nor

cause a notable diminution in the practice of the noble art of brief-making.

As one who has heretofore in general expressed an admiration for the author's methods and style may without suspicion of malice express the opinion that the first chapter, on state control of the insurance business, is less happy in conception and execution than the rest of the book. It seeks to cover a very extensive body of statutory law in 37 brief pages. Obviously this necessitates a very general treatment and he who generalizes on statutes is treading on very difficult and dangerous ground. What is true in a very general way is in given cases conspicuously incorrect and if the number of these given cases is substantial it is a deal better not to generalize at all or to do so in very guarded language.

On page 8 for instance it is stated that "this method of incorporation (i.e. by special statute) has become practically obsolete." It is true that incorporation of insurance companies under general law is today far more common than incorporation by special charter. But Connecticut has no such law and Massachusetts has no general law for the incorporation of life companies. Offhand, within my own time of legal memory, I recall one life charter granted by special act in Massachusetts, 2 compensation mutuals incorporated under the terms of the compensation acts of Massachusetts and Texas respectively, and in recent days the F. D. I. C. Again on the same page, with reference to incorporation of insurance companies it is said that "the assets of the company must be invested in securities of a specified type." This is far from being universally or even generally true. Generally the restriction affects only a portion of the assets.

The brief section on pages 16-17 relating to the valuation of securities is of necessity somewhat sketchy. The statement: "Sometimes the statutes prescribe the method of valuing bonds, with actual market value as the upper limit" conveys as it stands an impression not quite accurate. There are certain statutes which provide for valuation not exceeding the par or the market value, but what the author doubtless refers to are the amortization statutes. These frequently provide that the amortization value shall not exceed the market value at the time of purchase, but the very purpose of amortization statutes is to prevent the

values placed on bonds from being depressed by sudden falls or being exalted by sudden increases in market value.

The section on pages 17-18 headed "Approval of Investments" trespasses on particularly dangerous grounds. The investment laws of the several states vary from next to nothing at all to very precise and minute regulations. When therefore the author states that "statutory provisions narrowly limit the types of investment in which an insurance company may place its funds" he is laying down as a general principle something which can hardly be predicated of the laws of Connecticut, of the present New York law relating to companies other than life, or of the laws of a number of states which with regard to companies other than life restrict merely a very limited portion of the funds. The statement as to life companies: "They are usually restricted to high-grade bonds or mortgage notes, with some exceptions in favor of preferred or guaranteed stocks" should be amended by omitting the term "high-grade." That doubtless is the intention but the great majority of investment laws relating to life companies include some categories which do not necessarily describe high-grade bonds. Certainly policy loans should be added, also collateral loans, and the tendency of late years has been in the direction of wording the law to include such items as equipment trust certificates, bankers' acceptances and bills of exchange eligible for rediscount by the Federal Reserve banks; and these certainly do not come within the terms of the statement quoted.

The growing size of life insurance funds has indicated the need of broader investment outlets. At the moment there is about half a billion of cash funds of life companies awaiting investment. The statement: "The life insurance company's obligations are payable in a fixed amount of dollars and hence its investments should be of a similar character" is one frequently urged but none the less involves a distinct non-sequitur. Again the statement that a life company may invest in real estate only to the extent requisite for its convenient accommodation in the transaction of its business is hardly accurate. A goodly number of states authorize investment in home office buildings without this restriction. There are also very common provisions as to rights to hold other real estate for limited periods and one may mention the laws of New York and New Jersey authorizing life

companies to construct and hold tenement houses designed to relieve a shortage in housing accommodations.

The paragraph on "Deposits of Securities" (page 19) seems drafted with an eye merely to one type of deposit, the special local deposit. The statement as to purpose: "to bring within the grasp of a government official tangible securities available for the satisfaction of the classes of local policyholders" does not apply at all to deposits made for the benefit of all claimants in the United States, a much more frequent type of deposit, or to deposits of the reserve funds of life companies made in some states as a general requirement on domestic companies, in others as a condition for the issuance of "certified" or "guaranteed" policies.

The paragraph on page 22 et. seq. relating to control of premium rates deserves some alteration to meet the compensation rating statutes which set up adequacy as a criterion quite as frequently as reasonableness. The devices mentioned as an indirect control of life insurance premiums; those compelling the declaration of dividends to policyholders, affect of course only participating companies. One might couple with this a provision which operates effectively to keep premiums up; the provision in the law of New York and other states requiring the setting-up of a very heavy reserve in cases where the premium falls below a certain standard.

These instances suffice to show the difficulties into which he runs who tries to generalize as to insurance statutes. When one progresses from this first chapter to the rest of the work the difference is marked. In the first chapter the author is frankly attempting the impossible and the result is not happy. In the remaining chapters he deals with a more manageable field. His style becomes clear, lucid and perspicuous and the result is something worthwhile.

CLARENCE W. HOBBS.

Legal Aspects of Group Life Insurance. Julian Bamberger. 138 E. Washington St., Indianapolis, Ind., 1934. Pamphlet. Pp. 61.

The purpose of this pamphlet, as expressed by its author in the foreword, is to set forth briefly legal authorities peculiar to group insurance, as distinguished from closely related fields. He has not attempted an exhaustive digest or discussion of the law

applicable. The usefulness of this pamphlet is increased by a detailed topical index. Because of its brevity, however, the hope of its author that members of the bar, working in the field of group insurance might find their research facilitated is less likely to be realized; the notes in the American Law Reports—Annotated—still represent the best analyzed, up-to-date digest of group insurance case law known to the writer.

The treatment of the legal principles is clear and should be of considerable help to that large group of persons having no legal training but interested in the fundamental rules upon which the group life insurance industry is based. This should include agents and home office employees of companies, who must answer countless questions on the subject.

The pamphlet contains errors in reference and printing which do not add to the reader's confidence in the matter. On page 9 the word "employee" is used for "employer" in connection with the important principle that the contract is made between the insurer and the employer, rather than between the insurer and the employee. On page 12 a South Carolina case is referred to as a New York case and on page 28 a North Carolina case as a Connecticut case.

In connection with the treatment of the rules involving the certificate of insurance as a part of the contract, it might be pointed out that in Mr. Bamberger's state—Indiana—a statute specifically provides that the individual certificate issued by the insurance company shall not become a part of the contract between the parties.

Decision in a case involving the important subject matter treated on pages 28 and 29 of the pamphlet on the duty of an employer to notify an employee of termination of employment is pending in the Supreme Court of Connecticut, the outcome of which should be of considerable interest. (*Emerick vs. Connecticut General Life Insurance Company.*)

WILLIAM BROSMITH.

Fire & Marine Insurance Year Book. Stone & Cox, Ltd., London, 1934. Pp. 851, 144, vi.

This book might well be called an encyclopedia or compendium of useful information on fire and marine insurance in Great Bri-

tain. From the title one would expect that it would consist mainly of financial statistics but these are confined to a series of tables which occupy only about 50 of the thousand pages.

After a brief introduction and review of the events of the past year in fire insurance a surprisingly large section is devoted to fire prevention and allied topics. 128 pages are given to such chapters as "The Causes and Prevention of Fire," "Building Construction," "Lighting and Heating," "Common Hazards" and "Fire Detection and Extinguishment." In addition there are 172 pages in the "Fire Brigades" section to describe the fire fighting equipment of each municipality in England, Wales, Scotland and Ireland.

The "Trades Section" furnishes a description of the hazards peculiar to particular industries. This is arranged alphabetically from "Acetylene Engineers" to "Zinc Smelters and Workers." In some cases detailed descriptions and illustrations of machinery are given as in the case of woolen mills where 13 pages are devoted to the one industry.

Of very real value to the student is that portion of the book containing a history of the business and a description of present practice as set forth in chapters such as "Principles of Fire Insurance," "Salient Points of a Fire Policy," "Developments in Fire Insurance Practice" and "Assessing Fire Losses." Considerable space is given to the laws affecting insurance, numerous statutes being quoted at considerable length and supplemented with explanatory notes.

There are 6 tables containing financial data of fire insurance companies. In one table are given for 47 British companies the market quotations of shares, dividends paid, interest income and trading profit. It is interesting to note that some companies report as many as 5 or 6 different classes of shares.

The underwriting experience of British offices is set forth in 3 tables, one for total business, one for business in the United States and another for business in Canada. The data consist of net premiums written, losses and expenses incurred and unearned premium liability. The percentage of premiums used in computing the unearned premiums is shown in each case and while these percentages vary from 20% to 100%, the most common is 40%. Figures for either three or five years are shown and while this is styled the 1934 year book the latest data are for the year 1932.

Quite similar tables show the aggregate world-wide transactions of American companies, of members of the American Foreign Insurance Association and of Dominion and foreign companies. In the case of foreign companies the currencies are not translated to English money but appear as marks, dollars, sterling, francs, lira, kronen, rupees, pesos, pesetas, yen, pengo, milreis, zloties.

Marine insurance is given separate treatment and the description of the historical development of the business is of particular interest. The statistics are confined to 2 tables, one covering the experience of British companies and the other of Dominion and foreign companies. The 71 pages given to a description of the origin, development and method of operation of Lloyds together with a list of underwriting members and the various groups is a revelation to anyone not familiar with this unique method of insurance. The importance of reinsurance in fire and marine insurance is evidenced by the 68 pages given to this subject.

The affixing of the proper revenue stamps is a matter of serious concern to a company doing business in the United Kingdom. Considerable space is required merely to list the many requirements in regard to the use of stamps. Fire insurance policies, incidentally, require only a flat 6 pence stamp.

The latter part of the book contains a directory of insurance offices, a complete roster of the officers and members of the Institute of Actuaries, of the Faculty of Actuaries in Scotland and of the Chartered Insurance Institute. There are likewise data for 39 local insurance institutes and 54 intercompany and general insurance organizations.

While this publication has primarily to do with property insurance many of the underlying principles are common to casualty insurance. The emphasis on loss prevention is worthy of note and doubtless offers a partial explanation of the much lower fire loss in the United Kingdom as compared with the United States. If one seeks for a description of rating methods in fire or marine insurance he will hardly find it in this book. It is assumed that rate making has not been reduced to a standardized procedure and therefore remains largely an underwriting mystery. Regardless of this omission the book contains a vast amount of useful information for anyone engaged in or interested in our two most ancient and still indispensable kinds of insurance.

H. O. VAN TUYL.

Inland Marine Insurance. Earl Appleman. McGraw-Hill Book Co., Inc., New York, 1934. Pp. xii, 221.

The chaotic condition in many respects of inland marine insurance (an utterly misleading name) makes an articulated description of the business especially necessary. The two outstanding virtues of Mr. Appleman's book are its conciseness and, with due allowance for the nature of the subject, its readableness.

The scope of the book is well indicated by its sub-title, "an interpretation of the policies," for this is all it covers, containing no mention of premium rates, reinsurance, agency relations, state regulation or other important phases outside the range of the sub-title. This is in some ways an advantage, enabling concentration on the aspects covered, provided the limitations are understood by the reader in advance.

The author's method is to divide policies into 3 groups: transportation policies, including also trip transit, parcel post, registered mail, armored car and messenger and owner's motor transit policies; floater policies, including 10 which insure the "personal property of individuals" and 8 which insure "property used in the assured's business;" and bailee, legal liability and special risk policies. As the author points out this is not a logical classification scheme, but he is not responsible for the irregular proliferation of the business and it serves its purpose.

The appendices contain articles of agreement among insurers on scope of marine policies, a typical transportation policy, broad form and all-risk endorsements thereon, jeweler's block policy and personal effects floater.

The statement on p. 59 with respect to "other insurance" is far from clear. Even a clarification of the statement however would not help much in understanding the inland marine clause quoted on that page, which is thoroughly incomprehensible if it means what it says. In connection with the first paragraph on p. 85 respecting assignment, are there not numerous fire insurance decisions holding that an assignee receives only the rights possessed by the assignor and is subject to all the defences against the latter? On pp. 139-140 the value of a bailee's inland policy to the bailor or owner is stated but it is evident later that some policy wordings may make the insurance nearly valueless from the bailor's standpoint. The author in fact states on p. 146 that

"if it is desired to cover in one policy the bailor's interest as well as the assured's liability, clear and unambiguous words to that effect should be employed."

Opportunities for criticism are few, however. The book is useful, not merely because insurance men are peculiarly closely affected by legal questions, as the author states, but because he has brought together in one place interpretations supplied by decisions and statutes in the marine, fire and casualty fields. The author has obviously endeavored to keep the book down to essentials. It is concise and well written.

ROBERT RIEGEL.

Inland Marine Insurance. William M. Mortimer. Transportation Service Co., 45 John St., New York, 1934. Pp. xiv, 441.

In fairness two parts of this book must be separately considered. Part I (198 pages) deals with the legal liability of carriers and some additional phases of the transportation system. This is intended as a background for the discussion of the inland marine insurance section. Strangely enough, it seems to the reviewer the best part of the book. It gives the historical development as well as the present status of carriers' liability.

Part II (text 185 pages, appendices 55 pages) describes prominent types of inland marine policies. Its intended scope is about that of Appleman's *Inland Marine Insurance*. There is no evident attempt at a classification of policies and they appear to come in purely random order. Such terms as "floaters" are introduced without definition, and when it is considered how loosely this term is applied in insurance even a reader acquainted with other forms of insurance is likely to be baffled.

To the reviewer the greatest difficulty was created by the introduction, almost verbatim, of page after page of policy provisions, often with substantial repetitions and legal phraseology. This grows monotonous reading after 15 or 20 pages and these portions the reviewer frankly admits he did not read, and does not intend to. This book is too expensive to have so much space devoted to provisions which might be obtained by soliciting sample policies from an agent. Such fidelity to the policy language is safe procedure but it does not enhance the insured's or agent's knowledge very much.

The useful features of this section are the author's remarks on particular policy provisions, which indicate considerable experience with specific problems in inland marine insurance. But these are often separated from the dull recital of policy sections only by parentheses, making it difficult to cull them out. The last 3 chapters, where the author obtains release from the policy language, are more readable than the other sections but probably few readers will get that far.

In many cases the clarity of the presentation is marred by ineffective punctuation and unhappy modes of expression. The appendices, aside from 13 transportation forms, are mostly *application forms* and proposals for insurance. Just what use the reader is expected to make of them is not clear, as they principally show in detail, of course, the information an insurer wants before accepting a risk.

This book is a disappointment, for it appears that the author is a person of experience, with a considerable fund of knowledge on the application of inland marine policies and forms to particular businesses, whose practical comments on individual policy provisions are frequently useful from the shipper's standpoint as well as that of the insurer.

ROBERT RIEGEL.

Negligence with Food—Drink—Drugs. Frank G. Turner. Portia McLeland, Miami, Florida. Pp. 275.

This is a work of competent legal scholarship. It distinctly makes a valuable contribution to a field of law which heretofore has lacked both hornbook and textbook authorities.

The author, Frank G. Turner, is a member of the Florida and New Jersey bars, and is the author of a previous publication on the law of evidence in New Jersey. No doubt the favorable reception accorded that treatise by reviewers had a definite bearing in the presentation of this new book.

The subject matter of *Food—Drink—Drugs*, interwoven with the complexities of modern life, is within a sphere of comparatively recent development of our law. The chapters have a logical treatment which is comprehensive in its scope. The analysis employed in the chapter on deleterious matter is particularly well done.

The rationale applied by Mr. Turner is really a formula for extracting the underlying principles of a case and stating them in concise language, with sufficient of the facts added to make clear the application of the principles. Every legal principle, so enumerated, is bulwarked by the actual citation in the footnotes. In all over 400 cases are cited in the work.

Of course it is to be expected that some inaccuracies are bound to creep in any legal treatise such as this. Perhaps the most outstanding is to be found on page 60 in the discussion of the celebrated case of *Merrill vs. Hodson*, 88 Connecticut 314, as follows:

The Connecticut Superior Court holds there is no implied warranty of the quality of food furnished by a restaurant keeper to a customer for immediate consumption, since the transaction does not constitute a sale, but a rendition of service.

The inaccuracy in this instance consists in citing the "Superior Court" when the "Supreme Court" was clearly intended. As it stands the source is misleading inasmuch as the Superior Court in the *Merrill* case maintained the contrary view, which was held to be reversible error by the Supreme Court.

It is regrettable that the very important decision of *Lynch vs. Hotel Bond Company*, 117 Connecticut 128, confirming the decision in the *Merrill vs. Hodson* case, was being decided at about the time Mr. Turner's book was in the press. As a very recent decision, *Lynch vs. Hotel Bond Company*—considering the thorough analysis presented in the opinion—will no doubt be a landmark in the law involving food and implied warranty.

A close examination of the number and relative importance of the cases cited by Mr. Turner throughout his work discloses that the leading cases have been drawn upon. Also majority and minority doctrines are indicated, which denotes that the book does not incline to dogmatism as to what the law should be, but interprets with skill actual holdings in the conflicting jurisdictions. Yet happily the book does not incline to the other extreme of being merely a quotation of a welter of decisions, for there is ultimately evolved an accurate crystallization of the law on food, drink, drugs.

The application of statutory provisions is fortunately not ignored and adds to the scholarship of the work. Then too there

are informative chapters covering burden of proof, evidence, defenses, pleading and questions for the court and jury.

This book has a definite value in its field. It has of course also definite limitations, and cannot and never will be a substitute for the lawyers' resort to *Corpus Juris* or detailed cases found in the digest of his own jurisdiction. For brief work it is of some assistance; but really and primarily it is a compendium of general knowledge on food, drink, drugs for the student, claim adjuster, actuary or examiner who of necessity has need of knowledge of the law in passing on questions within this important field. For this purpose Mr. Turner's book cannot be surpassed.

In the last analysis it can be most highly recommended as the only existing handbook of ready reference in its field and from the standpoint of legal learning the profession is indebted a thousandfold to Barrister Turner.

WILLIAM BROSMITH.

Betrachtungen über die Mathematische Bestimmbarkeit der Schadenreserve in Unfall und Haftpflicht (Observations in Regard to the Mathematical Possibility of Fixing the Claim Reserve in Accident and Liability Insurance). K. Jannott. Gustav Fischer, Jena, 1934. Pamphlet. Pp. 34.

The methods developed by the Italians Amoroso, Bufano, d'Addario and Insolera in regard to the mathematical calculation of liability claim reserves have aroused attention in all countries. Section IX in the program of the X'th International Insurance Congress in Rome for May 9th, 1934, was designated: "Premiums and reserves for assurances against accident and civil liability." Some weeks before the congress the papers of 6 students discussing this problem were published: Austrian, German (Jannott), 2 Italians, American and Swiss. The papers published by the Italians caused Jannott to investigate whether and how far the statistical material of the accident and liability department of the Gothaer General Insurance Company in Gotha justified calculation of mathematical claim reserves by the methods proclaimed by the Italians. The result of these studies is the above-named pamphlet of 34 pages. It was also presented to the congress at the session of May 9th, 1934, and is a supplement to Jannott's paper of 16 pages mailed to members of the congress before the session.

Jannott was unable, however, to prove that the formulae developed by the Italian authors applied to the statistical material of the Gothaer are workable. The comparison of claim payments for successive years is not continuous and even average premium and claim frequency were no proof of continuity or average claim. The reason in Jannott's opinion is that the calculation of mathematical probability can be applied only to "experienced facts," while in liability insurance the claim payments will always depend on economic conditions for which mathematical laws do not exist and cannot be developed.

Dr. Serini of Berlin who took part in the discussion of May 9th, 1934, in Rome, offered the following opinion:

In regard to the problem under discussion it is impossible to say: "Ignorabimus." First, the fundamental assumption of Jannott is incorrect: that liability claims are a result only of economic conditions. The cause of liability claims is always to be found in *guilty actions* or *in the different ways of causing the claim*. That means it always depends on the will or carelessness of man or, expressed differently, on facts and circumstances but *not on economic conditions*. The inferior economic condition of the insured or the beneficiary does not affect the insurance companies adversely. The limits of mathematical statistics in the calculation of liability claim reserves are found in the "law of large numbers." We have to remember that the material of the Gothaer investigated represents liability insurance gradually built up during the last 10 years. The large numbers therefore will be missed at least during the first years. Furthermore the observations of later years cannot be compared with those of the earlier years because they are not homogeneous. Besides the claims have to be grouped in different classes of size according to their severity; perhaps in 7 groups as stated by Amoroso; not in 16 as grouped by Jannott. Furthermore it is not correct to use premiums charged in the formulae for calculating claim reserves. On the contrary it will be necessary to find the correct premium or true loss cost on the basis of claims incurred. On the other hand Jannott's division into 3 risk groups—"accident," "liability" and "auto-liability"—is not happily chosen. "Accident" has to be dealt with alone and for "liability" about 4 risk groups have to be chosen making it necessary always to observe a large number of equal risks in regard to their claim frequency. Jan-

nott says the problem is of sufficient importance to be taken up again by others and proposes universal notation for the formulae, an opinion shared by the principal discussor Professor Ottaviani and the other speakers. The statistical results of the Gothaer are to be seen in 7 tables.

FRITZ MULLER.

Results of Workmen's Compensation in Pennsylvania. 2 vols. John Perry Horlacher. Special Bulletin No. 40, Part I-B and Part I-C (Workmen's Compensation Studies). Department of Labor and Industry, Commonwealth of Pennsylvania, Harrisburg, 1934. Pp. 161, 238.

This work in two volumes presents a comprehensive analysis of a study designed to determine how the workmen's compensation system in Pennsylvania affects injured workers who come within its provisions.

The investigation was made by a staff of research workers under the immediate supervision of Professor Horlacher, acting under the auspices of an advisory committee of the Department of Labor and Industry of the Commonwealth of Pennsylvania.

In attacking the problem it was realized that the employee is affected not only by the provisions of the compensation law but also by the manner in which the law is administered, and that from the viewpoint of the workman 4 major interests are involved:

1. The character and adequacy of the medical treatment received.
2. Economic effects in terms of wage and other losses, and in re-employment following recovery from the accident.
3. Social effects in terms of changed standards of living, community losses, and the worker's morale.
4. The entire administrative process by which the injured worker is compensated for his injury.

The required information was obtained by interviewing workers injured in industrial accidents and by analyzing the official records of their cases. The study extended over a period of a year and covered 6,918 compensation cases, comprising 4,680 temporary disability, 1,644 permanent disability and 594 fatalities spread over 29 communities, located in 25 of the 67 counties of the state. Of the 6,918 cases 36.2% were incurred in manufacturing industries, 22.4% in coal mining, 10.2% in construction

and contracting, 8.5% in trading, 7.3% in state and municipal government service, 4.6% in public utilities and transportation, 0.8% in quarrying and other mining, and 10% in other occupations.

The 6,918 cases arose principally in 1932 and 1933 and represent 13.5% of the average annual number of all compensable accidents during these years. It may be questioned whether this percentage is adequate for the purpose of investigation. However, since the cases were selected because of their broad representative character from the relatively more serious types, they naturally represent some percentage larger than indicated for such types. It is quite probable that the total number of cases under observation furnishes a fair cross-section.

The author frankly indicates that in view of the specific or restricted purpose of the study no comparison was made of the Pennsylvania law with that of other states, nor a study of its interpretation by the courts, nor the effect upon labor policies, safety engineering, price of product and profits determined. It would seem that most of these phases which were not explored by the investigators would affect the workman to some extent, particularly labor policies and safety engineering. Indifference on the part of an employer towards the safeguarding of plant equipment or safe practices is bound to react on the workman, and for that matter the extent to which the latter is willing to cooperate with the employer in adopting safe methods for the performance of his job is also a factor.

The Pennsylvania Compensation Act of 1915 places upon the employer liability for the cost of medical treatment for workers injured in his employ, limiting the cost to \$100 for medical and surgical services, and to 30 days hospital treatment at the prevailing rates. The study discloses that medical treatment in the average case lasted 81 days and that 42% of the injured workers were treated for 3 months or longer, while only 7% show treatment ending in less than 1 month. The injured worker, realizing that after the benefits of the law have been exhausted he will have to sustain his own medical expense, is often compelled to forego additional treatment. Because of the 30 day limitation of medical liability of the employer, it has been found that in cases where further medical attention was necessary a modification in treatment by change in doctors, hospitals, etc., was re-

corded in 10.5% of the cases insured in the State Fund, 10.1% in the insurance company group, and 8.7% in the self-insured group. It has been deduced that fully 30% of the cases involving changes in the place of treatment resulted from "lifting," which means the transferring of an injured workman from one place of treatment to another either to reduce the cost of medical and surgical services or to bring such services under the control of the employer or insurer in cases where treatment was administered by hospitals and private doctors. It appears that one-half of all cases were treated by general practitioners who do not practice surgery. Considering that the cases under observation were of the relatively serious type, the proportion of surgeons seems low.

Insofar as economic and social effects are concerned it was found that the injured worker receives for compensation approximately half of what he would receive in wages. The law provides maximum compensation of \$15 a week. A third of the workers were able with compensation to carry on as before, while two-thirds were forced to take measures ranging from the practice of strict economy to seeking public relief to eke out their compensation benefits.

About 88% of the employees injured were reemployed, 77% returning to their old employers and 11% obtaining new jobs, the remainder being unemployed up to the time of the inquiry. Of those reemployed, 81% received the same wages as prior to the accident and 19% received less. In obtaining these figures, the influence of the depression upon reemployment was discounted insofar as possible although effects of the depression and injury are mixed to an extent which makes their complete disentanglement impossible.

The attitude of the injured, or in fatal accidents of his dependents was learned in 93% of the cases investigated. Seven out of 10 thought they had received fair treatment, and 3 protested unfairness. The latter group complained of small benefits, that benefits had shrunk after deducting expenses caused by the accident, of the trouble and delay of a hearing before a referee, of medical treatment, of delayed and irregular payments.

The investigators have concluded that the worker's opportunity for advancement was not affected by the accident in more than 75% of the non-fatal cases.

An injured worker receives compensation for a disability which exceeds 7 days by signing an agreement with his employer or insurance carrier calling for the payment of compensation either for an indefinite period or a stipulated number of weeks, and that the agreement must be approved by the Bureau of Workmen's Compensation. The Pennsylvania system is primarily an agreement system. Over 91% of the cases investigated disclosed that the compensation was handled by agreements. If the parties cannot arrange a satisfactory agreement the worker may file a claim petition with the Bureau, after which a hearing before a Workmen's Compensation referee is held, and the claim either disallowed or an award made. Three per cent of the agreements were effected after the petition was filed and either before or after a scheduled hearing.

Over 34% of those signing agreements believe them fair and sign willingly. 14% felt that they had little choice in the matter because of the need for immediate money. Over 12% admitted that they had signed more or less automatically without giving thought to the matter. In 11.5% of the agreement cases the worker's reason for signing did not disclose his motive or lack of motive. Others signed because of advice or influence from outside sources or mistake as to the nature of the instrument.

In less than 9% of the cases does the worker choose or receive his award for compensation by means of petition and hearing. The time which elapses between the filing of the petition and the referee's decision is on an average of 81 days. Appeals to the Workmen's Compensation Board are settled on the average in 111 days after the referee's decision. Further appeals to the Court of Common Pleas or to the Superior Court are decided within 6 months of filing. The investigators conclude that the machinery of justice for injured workers, like the mills of the gods, grind very slowly indeed, and that inequity aided by the hardship of delay destroys the even balance of the scales.

In 55% of the hearings both the employer and defendant were represented by counsel, in 33% only the employer or insurer was represented, and in 3% only the worker was represented. In view of the disproportion of the latter two figures it was felt that the worker was at a definite disadvantage. The employment of counsel on the part of the worker necessarily reduced the net indemnity to the employee. The author points out that the basic

reason for adopting workmen's compensation was to shift the loss occasioned by industrial accidents to industry on the theory that such accidents are a legitimate part of the cost of production, and seriously questions whether the Pennsylvania system of compensation accomplishes this purpose. It is his opinion that too much latitude is allowed the employer or insurer under the agreement system; that the Bureau, to which the agreement is submitted for approval, is at a disadvantage not only because it must rely upon information supplied by the employer or the injured, but also because the worker frequently signs through force of circumstances or for other reasons which do not constitute true consent. Inadequate cooperation between the various administrative bodies has the effect of placing the injured worker and his dependents at a disadvantage.

The work is presented in two parts. Part I-B is devoted to the text and sociographics (dramatized statistics) and contains 161 pages. Part I-C consists of statistical tables shown on 238 pages. The two volumes are replete with interesting and informative details. The author skillfully marshals and analyzes the facts ascertained by the investigation so that the reader may not go astray in interpreting their import. The subject is well presented and should prove of value to students of compensation insurance.

LEON S. SENIOR.

Self-Insurance of Workmen's Compensation in Pennsylvania.

Howard M. Teaf, Jr. Special Bulletin No. 40, Part II (Workmen's Compensation Studies). Department of Labor and Industry, Commonwealth of Pennsylvania, Harrisburg, 1934. Pp. viii, 176.

In this Bulletin is presented a detailed analysis of self-insurance, which was commenced in connection with studies of the Pennsylvania workmen's compensation system made by the Governor's Committee on Workmen's Compensation in 1933, and completed partly independently and partly under the auspices of the Pennsylvania Department of Labor and Industry's Advisory Committee on Workmen's Compensation. To both committees Mr. Teaf, who is Instructor in Economics at Girard and Haverford Colleges, was Research Assistant.

In conducting his survey the author had complete access to

the records of the Bureau of Workmen's Compensation and the cooperation of the various departments of the Commonwealth. In the course of the survey Mr. Teaf made a careful study of self-insurance procedure, and (based partly on a questionnaire answered by 97 per cent of the self-insuring employers in the state) an analysis of all self-insured open compensation cases. A representative number of self-insurers was also interviewed.

The result is a most interesting and instructive report on a subject about which, considering the extent to which self-insurance is practiced, surprisingly little has been written. The statistical data presented relate entirely to Pennsylvania and the report in general refers primarily to self-insurance as practiced in that state. While the laws and regulations respecting self-insurance of workmen's compensation vary considerably among the different states the completeness of this study and the meagreness of other published material make it of general interest.

The first chapter is devoted to a discussion of the principles underlying self-insurance in general and self-insurance of workmen's compensation in particular. The requisites to sound self-insurance are shown to be the combination of a large number of independent risk-exposures under a single risk-bearer and the financial ability of the risk-bearer to withstand the drain of possible losses in excess of the average, or the anticipated total. Hence self-insurance is a sound and justifiable practice for large-scale business only.

Following this is a review and analysis of statistics to show the relative importance of self-insurance of workmen's compensation in Pennsylvania. Although there were only 438 authorized self-insurers in that state at the time of the study, as compared with more than 120,000 insured employers, the self-insurers employed more than 30 per cent of the number of workers estimated to be covered by the Workmen's Compensation Act, and in several of the heavy industry groups more than half of the total employment was covered by self-insurance. This concentration in the heavy industries of self-insurance accounts in part for the fact that self-insurers paid over 42 per cent of the compensation benefits. In his analysis of loss payments the author brings out the interesting fact that for every one of the years reviewed (1929-1932, inclusive) and for every degree of disability (fatals, permanent disabilities and temporary disabilities) self-

insurers paid a higher average amount per case than insurance companies. Of the several possible explanations which the author suggests, he eliminates by further statistical investigation all except the following: generosity, and carelessness or ignorance on the part of self-insurers. If the author's reasoning is sound—and it appears to be—this would controvert the accusation sometimes made that self-insurers take advantage of their position as employers to deprive injured workers of their full compensation rights.

The chief incentive to self-insurance is the saving which may be possible arising out of: (1) differences between actual losses and the expected losses reflected in the pure premium, and (2) the avoidance of certain expenses incurred by insurance carriers passed on to policyholders through the expense loading. The differences between actual and expected losses result from the fact that except for a few large risks the experience rating plan does not allow an assured's experience full credibility. In addition risks with progressively improving loss ratios do not realize reductions in their insurance rates promptly because of the lag owing to the multi-year experience period on which experience rating is based. After reviewing the expenses incident to self-administration of workmen's compensation the author concludes that these would total only a little over 10 per cent of the gross insurance premium as contrasted with the 40 per cent insurance loading. This conclusion is based on the assumption of a saving of the entire acquisition cost, about half of claim adjustment expenses, the major part of Rating and Inspection Bureau expenses, the entire tax item and about two-thirds of home office expenses. The expense saving, he points out, would be considerably less if compared with the cost of insurance in a participating company though somewhat in excess of dividends customarily paid. The author's estimate of the saving on home office expenses is based on judgment, inasmuch as self-insurers do not keep records of administrative cost. In the case of adjustment expenses his conclusion is based partly on judgment and partly on the fact that a complete adjustment service can be procured for 5 per cent of what would be gross insurance premium. Opinions may differ as to whether savings on these two items as great as the author's estimate can be realized by self-insurers generally. Non-pecuniary incentives to self-insurance are the desire of an employer to deal directly

with his employees and dissatisfaction with insurance company administration and claim adjustment.

In the chapter on self-administration the administrative organization and policies of self-insurers in handling compensation matters are surveyed. There are 3 forms in which reserves may be carried by self-insurers: (1) mere bookkeeping reserves, i.e. reserve accounts for which no assets are allocated, (2) funded reserves, i.e. reserves for which specific assets are earmarked, though not legally separated from general assets, and (3) trustee reserves. The study reveals that on July 31, 1933, more than 77 per cent of the outstanding liability of self-insurers was covered only by bookkeeping reserves or was not covered by any reserves. Consideration from the legal viewpoint is given to the adequacy of each type of reserve. In this chapter the subjects of reinsurance and independent management services are also dealt with. The 2 forms of reinsurance applicable are single accident excess coverage and aggregate excess or "stop-loss" coverage. The former is the more common type although at the time of the study only 22 per cent of the self-insurers were protected against catastrophe losses in this manner. The author recommends that reinsurance of this type be required by the Bureau of Workmen's Compensation of every self-insuring coal-mine operator and of all other self-insurers whose catastrophe hazard is great. Aggregate excess coverage is used but slightly, in part at least because the Pennsylvania law forbids admitted insurance carriers to write this form of policy. This form of coverage is of most use to self-insurers who are dubious as to the regularity of their annual losses; these would be the smaller self-insurers. The author feels that for some self-insurers reinsurance of this type would perform a real function and that the restriction which now prevents its being written by admitted carriers should be repealed.

In the chapter on state administration the author points out that the Pennsylvania law sets up as a measure of self-insurability only the criterion of financial ability. The policies and procedure of the Insurance Coverage Section of the Bureau of Workmen's Compensation in passing upon applications for exemption from the insurance requirement of the Act are reviewed and certain suggestions for improvement made. The matter of compliance with the provisions of the act is surveyed and the conclusion is reached that although only a few of the self-insurers can

be accused of non-compliance the number is sufficiently large to require efforts toward correction.

The principal recommendations of the author are:

(1) That every self-insurer be required to file at regular intervals reports of all outstanding cases valued according to the rules of the Pennsylvania Insurance Department.

(2) That every self-insurer be required to maintain with an approved trustee an amount at all times equal to his total outstanding liability, with a minimum of \$10,000.

(3) The adoption of an education program directed to all self-insurers and to employees as to their rights under the law.

(4) That the Bureau be given the right to revoke the exemption of any employer who, after a warning notice, fails to comply with the provisions of the Act or the Bureau's regulations.

Although undertaken primarily as a survey of the practice of self-insurance in Pennsylvania with a view to suggesting needed changes in law and state administration, this study contains a wealth of information of value to self-insurers and concerns contemplating self-insurance. For this reason alone it merits a careful study by insurance company representatives whose problem it is to devise methods that will encourage the continuance of coverage by desirable risks. As the author points out the subject of self-insurance is one concerning which there is a marked division of opinion. Nevertheless he appears to have dealt with the subject impartially.

HOWARD G. CRANE.

The British Attack on Unemployment. A. C. Hill, Jr. and Isador Lubin. Economic Publication No. 51. The Brookings Institution, Washington, D. C., 1934. Pp. 325.

It is the belief of the authors of this volume that "a permanent plan to protect workers from the ravages of enforced unemployment will shortly become an integral part of our national policy." Accordingly they have prepared this comprehensive discussion of the entire British attack on the problem of unemployment "in the hope of casting some light upon the problems which we in the United States must face." While the unemployment insurance system naturally occupies the major portion of their work the other phases of the unemployment problem in Great

Britain—the employment exchange system, relief works, methods of transference and training—are also considered, and an attempt is made to assess their value in relation to the problem as a whole.

While the British Unemployment Insurance scheme covers approximately 13,000,000 members of the working class a further 7,000,000 representing some of the best risks are excluded because of the type of work in which they are engaged—domestic service, agriculture, civil service, teaching, nursing, etc.—or because they are under 16 or over 65. Contributions are exacted from 3 sources: the worker, the employer, and the State. Instead of their being differentiated according to occupation or earnings as in some other European schemes, a flat rate which varies only according to age and sex is levied on all persons. This rate is at present 10d. weekly from each of the three contributing parties for a man 21 or over and is graded down to 4½d. for girls, age 16 to 17.

The amount of benefit varies according to the number of dependents for whom the worker is responsible, but is otherwise the same within certain broad categories of workers. The normal rate for an insured male is 17s. weekly, to which is added 9s. for his dependent wife and 2s. each for his dependent children. These benefits are payable, following the fulfillment of certain qualifying conditions, for a normal period of 26 weeks in one year, though in certain rare cases, depending upon the record of insurable employment over the last five years, they may be extended to 52 weeks in a year.

To persons in need who have exhausted their rights to benefit or who have never been insured at all additional allowances may be granted by the Unemployment Assistance Board, set up in July, 1934, for the purpose of differentiating between "insurance" and "relief." These "assistance allowances" are conditional upon the recipient satisfying a "means" or "needs" test. This method of providing for the extension of unemployment benefits beyond the statutory period replaces the former practice of granting various forms of extended and transitional benefit within the framework of the insurance scheme itself. It was the drain on the insurance fund resulting from this practice that was mainly responsible for the appointment in 1931 of the Royal Commission, which recommended the present system after an exhaustive study of the problem.

The authors point out that, since the unemployment insurance scheme was extended in 1920 to provide its present coverage and up to March, 1934, the cost of unemployment insurance in Great Britain amounted to £992,000,000. Of this sum £619,000,000 represented the contributions of workers, employers and the State, while the remainder, which was largely the result of the above-mentioned extension of benefits, was for the most part furnished by the Exchequer. However, £115,000,000 of it is recognized as a loan to the unemployment insurance fund and provision has been made for its repayment.

The authors have striven to be impartial in their treatment of the subject and they appear to have met with considerable success in avoiding that fanaticism to which those who advocate and that cynicism to which those who oppose broad social measures are so often susceptible. Their work can be confidently recommended to anyone who wishes to be well informed concerning the British system of unemployment insurance.

J. D. CRAIG.

Unemployment and Relief. Robert G. Elbert. Farrar & Rinehart, New York, 1934. Pp. xii, 136.

In this book Mr. Elbert analyzes from a realistic viewpoint the social and business problems of prolonged widespread unemployment. He points out that unemployment results from a variety of causes, one of the most important in this country being a defective banking system. In our present stage of development it may not be possible to prevent this economic disease, but it is our duty to seek a remedy and in any event to alleviate its worst effects.

The program suggested by Mr. Elbert consists of unemployment insurance benefits for a limited period as a right, followed by systematic public relief subject to a means test. The unemployment insurance system he outlines as a tentative plan would be national in scope, compulsory, contributory, and operated on the pooled reserve principle. The detailed provisions of the proposed plan are of the conventional type and are probably included to serve mainly as a basis for discussion of the principles to be taken into consideration in formulating legislation. At any rate they serve this purpose effectively and Mr. Elbert's discussion of

these principles is clear and forceful. The least persuasive section is that dealing with the handling of the unemployment reserves. It is not clear from the brief discussion of this problem that the suggested method of investing these sums in a special type of government obligation, which would replace an equivalent amount of the national debt, would have the indicated effect of restricting credit in boom times and expanding it in time of depression. The discussion of unemployment insurance includes a brief review of the British system, the Wisconsin plan, and other plans proposed by organizations and individuals.

In his discussion of public relief Mr. Elbert goes into considerable detail in outlining the type of permanent organization required for this purpose and the detailed methods of administration and control. This part of the program would include employment training as well as direct and work relief. Work relief would be limited to projects of definite economic value, which in the interest of efficiency would in all cases be let out to private contractors. The funds required for relief purposes would be raised by a retail sales tax on everything but the bare necessities of life.

At various points in the development of his main theme Mr. Elbert takes the opportunity of expressing his interesting views on more or less related topics which crop up in the discussion. The final chapter for example is entitled "The Money We Do Not Spend" and contains a proposal that the income tax be based on income saved, rather than on income received. His proposal would doubtless appeal to a good majority of taxpayers.

The publishers of "Unemployment and Relief" are wholly warranted in claiming that "it is free from the curse of dullness which unfortunately sometimes pervades economic literature in general." The subject-matter and its presentation combine to make this an excellent book.

OTTO C. RICHTER.

Unemployment Insurance. Lessons from British Experience.
National Industrial Conference Board, New York, 1934.
Pamphlet. Pp. viii, 30.

There are two ways of taking this useful little publication of the Conference Board. It summarizes swiftly the original British insurance scheme, the post-war changes that caused its so-called

"financial collapse," the final report of the Royal Commission of 1932 and the legislation that resulted from the Commission's recommendations. So far fair enough. But the gist of the matter comes in the short chapter on "Lessons from British Experience." There are 8 of them and not one is news to students and experts in the field. If the chapter ended with number 8 we could commend it as a brief and lucid statement of a set of accepted facts. By now most of the lessons (for example, unemployment insurance is not a remedy for depression or chronic unemployment) are weary truisms. Even number 8, which states that "if unemployment insurance is not based on accurate knowledge of the facts of unemployment it will be abused both by workers and by employers."

But the paragraph that follows number 8 and to the casual reader seems to be a part of it is something quite different. It doesn't belong at all in a chapter on British lessons. It is dialectic of the most twisted unscrupulous kind. For the Conference Board concludes that since we cannot have the best unemployment insurance unless we have unemployment facts, we shall have to wait for all the facts before we get any of the insurance. No one should know better than the authors of this pamphlet how adroitly this reverses the only practically possible procedure. No one knows better or has preached oftener that in the actuarial sense unemployment insurance is not insurance and that only academicians still use this as an argument against any kind of unemployment compensation. The fact is that we can investigate and investigate from now till eternity and still be as far from unemployment compensation as we now are. The Board wants another "fact-finding body to make a thorough survey of the facts of unemployment, its nature and extent, to hold hearings and accept testimony." As if there had been no Committee on Economic Security, no fact-finding commissions in a dozen states, no universal acknowledgment that we simply have not beforehand the kind of data on unemployment that is a product of the compensation scheme itself. Just as if the British scheme itself had not been built on the meager data of 5 labor unions in a country with a dozen times our facilities in labor statistics.

This is by no means to say that the spadework has all been done or that all of it is of the highest quality. Nothing has been done in preparing for the tremendous and complicated adminis-

trative problems, practically nothing in coordinating plans for insurance and relief, nothing in planning to mesh together other social insurances and services with unemployment insurance. But to counsel perfection in this field and particularly in unemployment statistics is to fail either wilfully or romantically to be realistic. Precisely because unemployment insurance is not insurance it is possible and justifiable to start the system first and gather the data as you make them. Every one of the restrictions in an unemployment scheme: contribution-benefit ratio, maximum-weeks-per-year, 30 contributions-before-benefit, marks off the scheme from what actuaries consider insurance. Indeed after we get the data there is excellent reason to believe that—from the actuarial standpoint, as distinct from the administrative—unemployment statistics will largely be just so much history. Because this is so no one is considering or requesting that private carriers assume the risk. That surely *is* one of the lessons of British unemployment insurance experience all parties agree on.

C. A. KULP.

Unemployment Insurance and Various Forms of Relief for the Unemployed. International Labour Conference, Seventeenth Session, Geneva, 1933. International Labour Office, Geneva, 1933. Pp. vii, 299.

The purpose of the 17th International Labour Conference was to provide the materials for a draft convention (international regulation or agreement) on "the principles of unemployment benefit schemes." A considerable mass of factual material and occasional comment are presented on the definition of unemployment, benefits and benefit conditions, financing and administrative methods. The factual material, arranged in tables, provides an eminently useful cross-section of the unemployment insurance systems of the world. The world that is save Russia, which considers social insurance redundant, and the United States (represented only by the Wisconsin paper law) which considers it impossible.

Of comment and opinion there is little, and all of it incidental to factual comparisons. There is for example an interesting section on agricultural unemployment. Agricultural workers and domestics can be covered, and workers in employment currently

stable and those getting relatively high wages should be. There is a section also on the pros and cons of who should pay the bill and in what proportion, which here adds up to nothing as it always must. But there is no advice on the vexing administrative-economic questions of the married woman and of seasonal and casual unemployment. Social insurance experience is that there is no universal solution for problems so pervasive, so shifting and so intangible and so different in different countries.

It is concluded that any international agreement on unemployment insurance must necessarily be on the broadest lines. "There ought to be a substantial measure of equivalence" in definition of the risk, benefit conditions, the minimum benefit period and the persons covered. Administrative machinery must be left to the respective states. For an American it is odd at first to note the importance Europeans attach to the question of the treatment of foreigners and their consequent practical interest in uniformity. Then he thinks of his sovereign states, and ponders whether a federated government in these matters is a barrier or a blessing.

The report ends with a proposed draft convention agenda.

C. A. KULP.

The Wage-Earner's Life Insurance. L. L. Fuller, Special Editor. *Law and Contemporary Problems*, School of Law, Duke University. Duke University Press, Durham, N. C., January, 1935. Pp. 138.

The articles in this symposium relate mostly to group and industrial life insurance. There are 8 contributors: 4 university professors, a law student, a social worker, a labor union official who briefly describes group insurance for unions as written by union-organized companies, and former Insurance Commissioner Hobbs of Massachusetts, who gives an interesting account of the relationship of the insurance commissioner to industrial insurance.

It was evidently the desire of the editor to have the subject discussed from a variety of angles. Naturally then we find the practices of the companies subject both to praise and criticism, as should be the case in any well-regulated symposium; and of course there are panaceas, for who ever heard of a panacealess

symposium? When it is remembered that there are 8 contributors having many points of view, it is manifest that any detailed examination of the various articles would be far beyond the scope of a brief review.

Perhaps however special mention should be made of a comprehensive article by the editor, Professor Fuller, who has written a thoughtful analysis of the problem and policy conditions which apply especially to industrial insurance. His analysis of the facility of payment clause is especially thorough. Professor Fuller points out that, in general, a certain amount of discretion on the part of the companies, as in the case of the facility of payment clause, may in actual practice produce better results for the holders of small policies than a too strict "legalism."

The symposium represents a large amount of work and the results should be of interest to students of insurance. There is a collation of state statutes relating especially to industrial insurance and an account of the history and nature of group insurance, its policy provisions, existing legislation and court decisions.

The symposium closes with 2 articles stating the case for and against government life insurance, the former by Dr. Maurice Taylor, Director of the Jewish Family Welfare Association of Boston, and the latter by Professor E. J. Oglesby, Professor of Engineering Mathematics in the University of Virginia.

Dr. Taylor goes the whole way. He would have life insurance made a government monopoly. The entire assets of the companies together with the liabilities would be turned over to the Federal Government, except that in the case of stock companies stockholders would be reimbursed for their stock. He further proposes that the entire American people be brought under a plan of compulsory national life insurance, without medical examination and with rates the same for all regardless of age. In the case of those unable to pay the premiums the cost would apparently be borne by the government. Intentionally Dr. Taylor does not discuss such details as the amount of insurance, age of entry, etc.

Unlike Dr. Taylor, Professor Oglesby in presenting the case against government life insurance discusses mainly the nationalization of industrial life insurance. He discusses with some completeness various phases of industrial insurance. Reference is made to a number of government insurance plans that have been

attempted, and which have resulted either in failure or in very limited success, or which like Japanese Post Office insurance the author considers not to be adaptable to the United States. Finally he gives various reasons for believing that a government monopoly would not be advantageous to policyholders and concludes that "on the whole the industrial life insurance companies have done their jobs excellently. This fact coupled with the continual concessions to policyholders gives perhaps the strongest grounds for believing that destruction of the present organization and its replacement by a government bureau would represent little short of disaster to the working classes of the United States."

R. V. CARPENTER.

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CURRENT NOTES

A. N. MATTHEWS, CURRENT NOTES EDITOR

MONOPOLISTIC FUND AVOIDED IN NEW YORK

The insolvency of several large Compensation carriers operating in New York resulted in a deficiency in payments to disabled workmen and their dependents which was estimated at \$6,500,000. In order to prevent a recurrence of this situation a monopolistic state fund was proposed for New York, with the approval of Governor Lehman. The creation of such a fund would, of course, have meant the loss of a large volume of Compensation business to the private carriers, and the insurance companies accordingly protested. A compromise was eventually agreed upon, and it is expected that the present plan will guarantee the payment of all Compensation awards, without resorting to a monopolistic state fund.

The law now provides for the payment by the carriers of the full present value of all awards for death or permanent total disability into a special fund under the control of the Industrial Board. Claims for disability other than death or permanent total will be paid directly by the companies, as heretofore, but in order to assure payment of these claims in the event of insolvency it is provided that the companies will pay 1% of Compensation premiums into another special fund under the control of the State Insurance Department. These payments are to continue until the fund has reached a total of \$3,000,000 and are to be resumed whenever the fund becomes depleted. The stock companies are to contribute \$2,300,000 to this fund and the mutuals \$700,000. It is estimated that it will take approximately seven years for this reserve to reach \$3,000,000.

NEW YORK COMPENSATION EXPENSE LOADING

For a number of years companies writing Compensation business in New York have contended that a special loading should be included in the New York Compensation rates to cover the Industrial Commission assessments which are levied upon the companies to cover the cost of administration of the Compensa-

tion Law. In the past, insurance commissioners have refused to include this item in the expense loading and it has, therefore, been necessary for the companies to absorb this expense which during recent years has amounted to approximately 2.5% of New York written premiums.

In connection with the revision of rates effective July 1, 1935, Superintendent of Insurance Pink allowed the companies to include a 2.5% loading in the rates to cover the Industrial Commission assessments and to off-set this loading the acquisition allowance was decreased from 17.5% to 15%. On this basis, the maximum commission allowances for all stock companies, on New York State Compensation business, will be as follows:

Principal, branch and borough branch offices, policy writing general and policy writing borough agents, 15%.

Non-policy writing general and non-policy writing borough agents, 14%.

Regional agents and supervising special agents, 10%.

Brokers, local agents, office agents and district agents, 8%.

FLORIDA COMPENSATION ACT

Effective July 1, 1935, a Workmen's Compensation Act became effective in Florida. This leaves only the three states of Arkansas, Mississippi and South Carolina without laws providing Compensation benefits for injured workmen.

The Florida Act covers employees of the "state and all political subdivisions therefore except officers elected at the polls and all public and quasipublic corporations therein and all private employments in which three or more employees are regularly employed in the same business or establishment, except domestic service, agricultural or horticultural farm labor, and except to tractor saw mills and other saw mills employing not more than ten laborers in the operation of the mill, and in occupations covered by Federal Compensation, such as Federal Longshoremen's Act."

Under this Act, the term employee excludes "persons whose employment is both casual and not in the course of the trade, business or profession or occupation of his employer, or to persons who receive for their services a commission or percentage on the

business or work done, notwithstanding any drawing account or minimum guaranty that may be agreed upon."

Injury is defined as meaning "injury or death by accident arising out of and in the course of employment and such diseases or infection as naturally or unavoidably result from such injury." It would appear from this definition that the Florida Act does not cover occupational diseases.

The scale of benefits under this act is similar to those commonly found in the compensation acts of other states. A schedule of Florida Compensation rates has been prepared by the National Council on Compensation Insurance and approved by the Florida Insurance Commissioner. These rates are administered by a Branch bureau of the National Council located in Jacksonville.

RATE REVISIONS FOR PUBLIC LIABILITY LINES

During the past twelve months there have been countrywide rate revisions affecting most of the liability lines.

Effective August 6, 1934, a general rate revision was made in Owners', Landlords' and Tenants' Public Liability insurance affecting the area and frontage and miscellaneous classifications. As respects area and frontage, the rate levels were increased in most territories, with a revision of the relativity between classes even in those territories where the existing rate level was being maintained. At the same time, new excess limits tables were issued with lower percentage charges for nearly all combinations of limits. These new tables now apply to Owners', Landlords' and Tenants', Residence, Estate and Farm, Elevator and Product Public Liability.

Effective August 6, 1934, the use of compensation classification codes for Manufacturers' and Contractors' Liability insurance was discontinued and an alphabetical list of classifications was added to the Liability Manual. These classifications are effective countrywide without exception. The number of codes was reduced to about 200, which in itself is a great help in the preparation of statistics and in rate-making procedure. The effect on the rate level of the condensation of classes was negligible because the combinations were so made as not to disturb the existing rate level.

A revision of Public Liability rates for Apartments, Tenements, Boarding and Rooming Houses in Greater New York was made effective December 17, 1934, the result being an increase in most territories over the rates effective one year ago. For the first time a separate rate level was established for each borough rather than for the entire city.

Effective April 8, 1935, revisions were made in the rates for Theatre, Residence, Estate and Farm, Product and Elevator Public Liability. As respects Theatre, the exposure basis was changed from seating capacity to attendance, the new rates being per 100 admissions. This change was made in order to obtain a more accurate reflection of the variations in hazard between individual risks. In Elevator Public Liability a complete revision was made using new inspection costs as well as loss costs.

A general revision of Employers' Liability rates in Mississippi was made effective December 31, 1934. At the same time the important classes were reviewed in Arkansas, Florida and South Carolina and changes made where necessary.

IMPORTANT CHANGES IN OTHER CASUALTY LINES

An experience rating plan was adopted October 29, 1934, by the National Bureau of Casualty and Surety Underwriters for Plate Glass Insurance. The plan applies only in the states of Iowa, New York, North Carolina, Oregon and Hillsborough County, Florida, and is compulsory for all risks with an annual premium of at least \$200.

As respects Burglary Insurance, a new residence policy was put into effect May 1, 1935, providing coverage to the extent of 25% of the policy on the property of guests, employees and others which are not covered 100% under the policy. Prior to May 1, 1935, such property had to be specifically insured for an additional premium. In addition to this feature, the coverage under the policy was considerably broadened. On January 7, 1935, the Securities Insurance Policy for Lessees of Safe Deposit Boxes was issued providing all risk coverage on securities for Lessees of Safe Deposit Boxes.

PERSONAL NOTES

Frederick Richardson has been advanced to United States Attorney and Managing Director of the General Accident, Fire and Life Assurance Corporation.

James F. Mitchell, heretofore Assistant United States Manager, is now United States Manager of the General Accident, Fire and Life Assurance Corporation.

Edward S. Jensen is group underwriter of the Occidental Life Insurance Company at Los Angeles.

Emil Scheitlin has been advanced to the position of Treasurer of the Globe Indemnity Company.

Clarence S. Coates is Statistician of the Lumbermen's Mutual Casualty Company at Chicago.

LEGAL NOTES

BY

SAUL B. ACKERMAN
(OF THE NEW YORK BAR)

ACCIDENT—ACCIDENTAL MEANS—CAUSE OF LOSS

[Romanoff *vs.* Commercial Travelers Mutual, 277 N. Y. Sup. 291.]

While receiving an electrical baking treatment, two of the insured's toes were burned. The following day one of the toes became infected. Later the infection became so acute that it was necessary to amputate the toe and subsequently to amputate the leg above the knee. It was undisputed that at the time the insured received the burn he was suffering from two active pre-existing diseases, but for which the leg would not have been affected. Does the loss of this leg by this means bring the insured within the benefits of the policy providing for loss caused by external violent and accidental means?

The Court stated that inasmuch as the burns would not have resulted if the insured had not been suffering from these two active diseases, the loss of the leg was not the direct and proximate result of the burn nor was it due solely and exclusively to the burn and, therefore, the company was not liable under the terms of the policy.

AUTOMOBILE—OMNIBUS CLAUSE—PERMISSION OF INSURED

[Powers *vs.* Wells (Yorkshire Inc. Garnishee), 176 Atl. 62.]

The owner of a car carried an automobile liability policy containing the following clause:

"The insurance . . . is so extended as to be available . . . to any person operating, and/or to any other person, while riding in and/or to any other person, firm or corporation legally responsible for the operation of any of the automobiles described in the Warranties, provided such use or operation is lawful and with the permission of the named Assured, or of an adult member of the Assured's family."

The insured's chauffeur was accustomed to call for the insured's child at school at 3:30 o'clock in order to be at the school in time. On the particular day involved, the chauffeur left the house at about 2:30 o'clock and went to a place approximately ten miles beyond the school in order to obtain some parts for his own automobile. While at this particular place he ran over a child. This injured child sued the driver without joining the owner, and after having obtained a judgment against the driver brought in the insurance carrier as a garnishee. The chauffeur had not received any specific permission to use the car for his own purpose as he did here, but merely took the car a few minutes earlier in order to take care of his own business. From these facts can permission be implied so as to permit coverage of the driver under the omnibus clause?

The Court stated that, in its opinion, express authority to use a car for special purposes does not extend this right for all purposes; that permission to use the car to carry the employer's children from school to home cannot be construed as permission to the chauffeur to use it for his private purposes. It was the feeling of the Court that the chauffeur had abandoned his duties of employment when instead of going directly for the employer's children, he proceeded to a distant point on an individual errand. The relation of master and servant had been broken and had not been resumed. Under such circumstances, therefore, there can be no question but that the employer, the owner of the car, was not liable, nor can the insurance carrier be compelled to answer for the child's negligence, notwithstanding that the chauffeur had original permission to use the car for limited purposes.

BURGLARY—CUSTODIAN ON DUTY

[Boesky Bros. vs. U. S. F. & G., 255 N. W. 307.]

The policy which was issued to an insured contained an endorsement that the coverage for robbery within the insured premises extended only while "at least one custodian is on duty therein."

The manager of the insured's restaurant closed the premises at 3:30 A. M. He took two of his employees to their homes and then drove to his own home about five or six blocks from the restaurant. As the manager alighted from his automobile, a man

accosted him and forced him at the point of a gun to return to his car, drive back to the restaurant, unlock the door and open the safe. Under a threat of death the manager complied. The question which was involved was whether recovery could be had under the circumstances stated, in view of the endorsement.

The Court held that although ambiguities in policies are generally construed against the company, it did not believe that there was an ambiguity in the language of this policy in the light of what actually happened. The plain meaning and evident purpose of the words "on duty" was that at the time of the robbery there should be someone on duty who might be able to offer resistance or give an alarm, thus minimizing the risk of loss. When the manager and his employees left the premises there was no longer anyone on duty therein.

The Court believed that when the manager later returned under the compulsion of a robber who pressed a revolver at his side, it cannot be said that he was then on duty. He was no longer a free agent, but on the contrary an instrument or means of assistance to the robber. He was no longer in a position to perform his duties which he had ceased to exercise when he first left the premises and, therefore, the insured could not recover.

COMPENSATION—DOUBLE RECOVERY

[*Parchetsky vs. Kroll Bros.*, 275 N. Y. S. 322.]

An employee recovered an award of compensation for loss of use of his right hand. The employee cut his wrist on a water bottle, and was treated for the injury at a hospital, and later at a clinic maintained by the insurance carrier. The employee subsequently sued the carrier for the alleged malpractice of its physician. This claim was settled.

The carrier and employer now contend that the settlement should be set-off against the claim for compensation on the ground that otherwise there would be double payment for the injury.

The Court held where one has suffered injury by reason of the negligence of another, and, without fault on his part, his injuries are aggravated by malpractice, the law regards the two sources of injury as merged, the first being the proximate cause of the second. But in matters of compensation a different rule prevails.

Compensation is based on employment, not negligence. The amount of recovery is arbitrary and makes no allowance for pain and suffering. The employer and physician are not joint tortfeasors. In fact the employer may not be guilty of a tort at all. That the two causes of action are entirely unrelated has been held in this and other jurisdictions.

One action is to take the place of earning power, the other gives the injured person relief for his damages from negligence. If the company were correct in its contention, the negligent physician and not the injured workman would be the beneficiary of the compensation. There is no double recovery here.

CREDIT INSURANCE—RETURN PREMIUM

[*Sil-Turn Co. Inc. vs. London Guarantee & Accident Co. Ltd.*, 276 N. Y. S. 412.]

A credit insurance policy issued to the assured, contained a clause that if "during the term of this policy the insured shall become insolvent . . . then this policy shall immediately terminate."

The insured became insolvent approximately four months before the expiration of the policy and the assignee for the benefit of creditors of the insured sued for a proportionate return premium for the four and a half months of unexpired policy coverage. Is he entitled to the return of this "unearned" premium?

The Court could find no provision in the policy to warrant such a return and gave its reason in the following language:

"In the absence of any such provision to the contrary, if a legal risk has once attached or commenced, there can be no apportionment or return afterward of the premium. And diminution in its duration has no effect to decrease the amount stipulated as the premium for renewing the risk, for it is sufficient to preclude a return that the insurer has been liable for any period, however, short. This rule is based upon just and equitable principles, for the insurer, has, by taking upon himself the peril, become entitled to the premium, and although the rule may result in profit to the insurer, it is but a just compensation for the period assumed besides the danger incurred may be greater in any one moment than during the entire remaining period of insurance, and it

would be extremely difficult, at the last, to apportion the premium. The premium on said policy was based on the term for which the risk was written, and it seems to me from the explicit language of the contract that no adjustment of the premium was contemplated.

"The company stood ready to pay the whole amount of the risk at any time during the term of the policy, and on that basis the amount of the premium was calculated. The fact that the policy was terminated about four and one-half months before the expiration date by virtue of the insolvency of the insured is no cause to warrant a proration of the premium in the absence of any provision in the policy or statute to the contrary."

FRAUD BOND—LARCENY ON PREMISES

[*Kohler vs. Nat'l Surety Corp.*, 275 N. Y. S. 279.]

The insured at 9:05 A. M. sent an employee to the bank with a number of checks endorsed in blank for the purpose of cashing. Within two minutes he cashed the checks at the bank and absconded with the proceeds. This was discovered by the employer at 9:15 when the employee failed to return. The bond contained a provision that the insured would be indemnified for a loss "occasioned by larceny or embezzlement of money, merchandise and personal property owned by the insured, occurring on the premises . . . committed by any of the assured's employees identified by name as responsible for the loss."

Two questions are presented: (1) Was there a theft, that is, a loss by larceny or embezzlement committed by an employee of the assured? (It being admitted that a "loss" actually occurred.) (2) Did the larceny or embezzlement occur upon the premises of the assured?

The Court, in a very interesting opinion, stated the following:

"As we see it, the question as to whether or not the larceny was committed on the premises depends upon the intent of the employee when he received the checks to cash. If at the time he was given the custody of checks or before he left the premises he had the felonious intent to misappropriate them or their proceeds to his own use, the crime then and there took place. The short lapse of time between the employee's departure from the premises, his

receipt of the cash, and his disappearance, is sufficient to permit a jury to infer that he had formed an intent to steal the checks either at the time he received them or while still on the premises. It should be borne in mind that from the facts as we have them in this record, two minutes elapsed from the time the employee received the checks on the premises of his employer until he cashed them at the bank. The finding of criminal intent from circumstantial facts has long been within the province of the jury.

"It appears that the assured, in answering a questionnaire submitted by the insurer, after reciting the facts in connection with the loss, states in response to one of the questions that the embezzlement did not occur on the premises. This, it is urged, is conclusive and correctly states the inference to be drawn from the facts. The question called for a large conclusion and asked for an opinion which the insured as a layman was hardly qualified to give. It called for a complete understanding not alone of the terms of the policy but of the laws of larceny and embezzlement. At best it is merely evidence on a question of fact which the jury must decide."

FIDELITY—MISREPRESENTATION IN APPLICATION

[Becker Moore & Co. *vs.* U. S. F. & G., 74 Fed. Second 687.]

In the application for a fidelity bond to cover a corporation's secretary, the president stated in answer to the question "is the employee now in debt to you?" "No," and in answer to the question, "Do you know any circumstances tending to indicate that any one employee is not a proper person to bond," also "No." The answers made by the president were false in that the employee had personally embezzled some money prior to the application and had also assisted the president in embezzling some money. Can the knowledge of the president be imputed to the corporation, on whose behalf he made the application for the bond and can he be construed to be the agent of the corporation, thereby avoiding the bond?

The Court stated that even though the president's answers were not warranties in that they were not embodied in the policy, they were representations, on the faith of which the bond was delivered, and if material to the risk, should have been true or else

the bond could not survive. The good faith of the insured—that is, the corporation—is no defense in that event; it has been settled by law that such collateral misrepresentations, even though honestly made, will void a fidelity bond.

LIABILITY, NOTICE—SCOPE OF AUTHORITY

[*Bowyer vs. Professional Underwriters*, 256 N. W. 814.]

A customer brought an action against a beauty parlor for injuries sustained after a hair removal treatment and recovered a judgment for \$8,000.

The company claimed that no notice was given to it by the insured and that therefore the contract had been breached and there was no liability on its part. It was shown, however, that an adjuster who had been employed by the company had been carrying on negotiations with the injured party for some time prior to the obtaining of the judgment. The question of waiver arose as to whether the acts of the adjuster had waived the company's right to object on the ground of notice. From all the actions of this adjuster the insured was led to believe that authority was given to him by the company to act for it in all dealings concerning the claim, and since this adjuster did not ask for any written notice or proofs, the insured did not furnish them. Is the insured barred from recovering?

The Court held that the acts of the adjuster were within the apparent scope of his authority and not denied by the company and, therefore, the provisions of the policy as to notice were waived.

The Court in its decision, part of which is here stated, justified its conclusion on the following grounds:

The insurer also asserts nonliability because of the insured's failure to comply with the policy's provision that in the event suit was brought on a claim covered by the policy, a copy of the process and of the pleadings filed should be forwarded by the insured to the insurer. However, the record discloses that after the suit had been instituted a demand was made upon the insurer to defend in behalf of the insured. The insurer refused to do so and gave specific reasons for such refusal. There is positive testimony that the reasons for such refusal did not include that of

failure of the insured to notify the insurer suit had been instituted. This, appellant asserts, was a waiver of any such defense and estopped appellant from basing its claim of nonliability on the insured's failure to give notice of suit, forward copy of process, etc. That there may be waiver or estoppel under such circumstances has been held in numerous decisions of this Court.

ROBBERY—WHAT CONSTITUTES

[*Buckeye Union Cas. Co. vs. Strashun*, 194 *Northeastern* 384.]

The policy which was issued to the insured indemnified him for loss by burglary, theft, larceny, or robbery. The policy defines robbery as a "felonious and forcible taking of property from any of the individuals covered hereby accompanied by bodily injuries or threat of bodily injuries to the person from whom the property is taken or by putting such person in fear of bodily injury." The insured, an elderly man, together with his wife entered a theatre, and on account of the crowd were unable to go immediately into the theatre proper. The crowd was being held back by a cord and brass bar. While so situated, someone pressed the brass bar roughly against the insured, hurting his leg. He reprimanded the man who did it and was met with the response that he was doing his duty, as he was an employee. At the same moment, a man forced his way between the insured and his wife, elbowing the wife to one side with one arm and at the same time pressing his other arm against the upper part of the insured's body. The insured's wife asked this man what he meant by doing this. At that moment the cord was released and the people moved forward and the insured and his wife went to a seat in the theatre. The insured's clothing was mussed and his tie disarranged. While arranging his clothing, he noticed that his diamond tie pin was gone. There was a hole in his tie, tending to show that the pin had been removed by force as it had a safety clasp attached to it. The insured immediately notified the theatre manager and the police, but they were unable to recover the pin. Does this constitute robbery within the terms of the policy?

The Court in its opinion, reasoned as follows: "It is claimed that it is necessary in proving robbery, to show force and bodily injury, and that the evidence failed to show bodily injury. The

policy does not state the amount or extent of bodily injury necessary to come within the terms of the policy. We must therefore, conclude that any bodily injury, however slight, would be within the terms of the policy. As we have set forth in the brief statement of the evidence, the insured was suffering pain from the effect of the brass bar being pressed against his leg, which was undoubtedly done for the purpose of attracting his attention from any other part of his body. The policy does not state there must be an abrasion. There can be no pain without injury, when the pain comes from external force. The insured was also being pressed in the upper part of his body by a man on the other side. There is no question here of being put in fear, as both the insured and his wife, testified they were not in fear as they did not know the intent of the parties who were causing their discomfort. They were crowded and pushed about, and suffered discomfort and pain.

“Our conclusion is therefore, that the pushing of the brass rail against the insured’s leg, causing him pain and suffering, and the pushing of the man’s elbow against his chest and the upper part of his body, both of which caused him to complain, evidently for the purpose of perpetrating the act, and the mussing up of his clothing and the disarranging of his tie, fully justified the court, sitting as a jury, in finding that he did suffer bodily injury within the meaning of the policy.”

OBITUARY**F. HIGHLAND BURNS**

1873-1935

The sudden death of F. Highland Burns, Chairman of the Board of Directors of the Maryland Casualty Co., Baltimore, removes the last of the little group of seven persons who started with The Maryland when it commenced business on March 1, 1898.

Mr. Burn's death from a heart attack occurred suddenly on March 30 at his home on University Parkway, a few blocks from the Home Office, where, only a few hours previously, he had been at his desk.

Mr. Burns was born May 14, 1873, in Baltimore. He started his business career at the age of twenty as a clerk in a steamship office after being educated at private schools and at the Massachusetts Institute of Technology.

Mr. Burns began his career with The Maryland as a clerk—the only employe of the company without a title—when the Home Office consisted of a single room in the Keyser Building.

The first promotion which came to Mr. Burns was to the post of manager of the Claim Division. He was for a time, in fact, the entire Claim Division.

Advanced shortly to be Superintendent of Agents, Mr. Burns made the wide contacts and friendships which have proved so valuable to The Maryland through the years. Travelling extensively, he engaged the good-will of all whom he met. He was the personal friend of many hundreds of The Maryland organization.

After seven years service with The Maryland, Mr. Burns was elected third vice-president. He became second vice-president in 1910 and in another five years he was made first vice-president. It was by a curious coincidence that all his successive advances, including his elevation to the presidency on May 20, 1920, occurred at five year intervals.

When the office of President was made vacant by death it was significant that no other name was ever mentioned as successor to Mr. Stone. He was elected by unanimous vote of the Board of Directors.

As President, and later as Chairman of the Board, Mr. Burns became one of the most widely known insurance executives in this country. He kept in close touch with the progress of casualty and surety underwriting and his knowledge and experience were most valuable in working out the problems that presented themselves as new coverages were developed.


During the last three years Mr. Burns had given unstintingly of himself to the affairs of the Company. He was in touch with The Maryland's agents all over the country and his confidence and encouragement were an inspiration to the Company's great agency force. After becoming Chairman of the Board, Mr. Burns made several trips into the field, touching practically every part of the United States, and visiting Cuba and the Canal Zone.

Mr. Burns was Vice-President of the Western National Bank, and a director of the Eutaw Savings Bank, both of Baltimore. He was a Fellow of the Casualty Actuarial Society of America and an ex-president of the National Association of Casualty and Surety Executives.

The Executive Committee of The Maryland in a special resolution said, in part:

"Among his many qualities, Mr. Burns was superlatively characterized by the true spirit of modesty, unselfishness and fair dealing. Insistent always that credit be openly given wherever due, he would claim and accept none for himself. His word was his bond, and he followed in all transactions the spirit and not the letter. He was that finest of all men, a gentleman without fear and without reproach.

"Mr. Burns was in every way an outstanding personality. His memory is honored and will be honored by all who knew him; and by all those who had the privilege of a close association with him, it will be revered as an enduring monument."



OBITUARY**ARCHIBALD ASHLEY WELCH**

1859-1935

Archibald Ashley Welch, a Fellow of this Society, passed away at his home in Hartford, Connecticut, on May 8, 1935. He was the son of Henry Kirk White Welch and Susan Leavitt (Goodwin) Welch.

Mr. Welch was born in Hartford on October 6, 1859, and graduated from Yale University with the degree of A. B. in 1882. Upon graduation he entered the Actuarial Department of The Travelers Insurance Company where he remained until 1890 when he resigned to accept the office of Actuary of the Phoenix Mutual Life Insurance Company. He was elected Assistant Secretary and Actuary in 1903, Second Vice-President and Actuary on December 27, 1904, and was made Vice-President and Actuary in 1914. On February 28, 1924, he was elected President of the Phoenix Mutual Life Insurance Company, an office which he held at the time of his death.

Mr. Welch took an active part in the deliberations of The Actuarial Society of America, of which Society he served as President and at the time of his death was a member of its Council.

In addition to his responsibilities as President of the Phoenix Mutual Life Insurance Company, Mr. Welch achieved eminence in practical affairs as an executive and advisor. Mr. Welch was a Trustee of the Society for Savings, a Director of the Phoenix State Bank and Trust Company of Hartford, the Phoenix (Fire) Insurance Company of Hartford, and the Connecticut Fire Insurance Company of Hartford, Connecticut. Mr. Welch, as Chairman of Hartford's Americanization Committee during the World War, helped to begin the valuable work of adult education among foreigners now being carried on by the Board of Education of Hartford. In addition to his many other activities, Mr. Welch served as Chairman of the High School Committee of the City of Hartford, as President of the Chamber of Com-


merce, was Vice-President of the American School for the Deaf, President of the Hartford School of Music, a Trustee of the Watkinson Library, the Wadsworth Atheneum, the Bushnell Memorial, and on the Advisory Committee of the Art Society.

Mr. Welch was a member of a number of clubs, including the University Club of New York and the Century Association of New York.

In 1922, Trinity College conferred upon Mr. Welch the honorary degree of Master of Arts, recognizing thereby the many and valuable services he had rendered to the public in his leadership of civic affairs and in its cultural activities.

The closing paragraph of the resolution adopted by the Board of Directors of the Insurance Company of which Mr. Welch was President expresses the ideals which those of us who were permitted to know him intimately admire—

“To everyone who knew him, Mr. Welch was an exemplar of all that is best in life—a Christian gentleman, of innate culture, of great ability, of delightful charm, and to those of us who knew him best a loving and beloved friend. We are richer and better for having known him and we cherish his rare qualities of mind and heart as a lasting beneficent memory.”



CASUALTY ACTUARIAL SOCIETY

MAY 24, 1935

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ABSTRACT FROM THE MINUTES OF THE MEETING

MAY 24, 1935

The semi-annual (forty-fourth regular) meeting of the Casualty Actuarial Society was held at the Briarcliff Lodge Hotel, Briarcliff Manor, Westchester County, New York, on Friday, May 24, 1935.

President Greene called the meeting to order at 10:30 A. M., daylight saving time. The roll was called showing the following forty Fellows and fourteen Associates present.

FELLOWS

AULT	HULL	PERRYMAN
BARBER	HUNT	PICKETT
BARTER	JACKSON, C. W.	PRUITT
BLANCHARD	JACKSON, H. H.	SILVERMAN
CAHILL	KORMES	SINNOTT
CARLSON	KULP	SKELDING
CRANE	LINDER	SKILLINGS
DORWEILER	MCMANUS	SMICK
FONDILLER	MARSHALL	SMITH, C. G.
GRAHAM, C. M.	MASTERSON	TARBELL
GREENE	MATTHEWS	VALERIUS
HATCH	MAYCRINK	VAN TUYL
HOBBS	MOORE, G. D.	
HOOVER	ORR	

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FITZHUGH	HART	POISSANT
FURNIVALL	HIPP	SPENCER
GATELY	MACKEEN	WILLIAMSON
GILDEA	MILLER, J. H.	

Mr. Greene read his presidential address.

The minutes of the meeting held November 22, 1934, 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. Elsie Kardonsky had been enrolled as an Associate, having passed the examinations and completed the requirements as to experience.

The President announced the deaths since the last meeting of the Society of two Fellows, F. Highland Burns and Archibald A. Welch, and the memorial notices appearing in this Number were thereupon read.

The new papers printed in this Number were read.

Recess was taken for lunch at the hotel until 2:15 P. M.

There was an informal discussion of Social Insurance.

The papers presented at the last meeting were discussed.

Upon motion the meeting adjourned at 5:00 P. M., daylight saving time.

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CASUALTY ACTUARIAL SOCIETY

ORGANIZED 1914

1935 YEAR BOOK

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Papers in the Proceedings

(Addendum to Volume XXI of the *Proceedings*)

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 the organization of the Society comparatively little technical study was given to the actuarial and underwriting problems of most of the branches of casualty insurance. With the passage of legislation providing for workmen's compensation insurance in many states during 1912, 1913 and 1914, the need of actuarial guidance became more pronounced, and 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 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. After three years' work the Committee on Compensation and Liability Loss Reserves submitted a report which has been printed in *Proceedings* No. 35 and 36. The Committee on Remarriage Table after four years' work submitted a report including tables, printed in *Proceedings* No. 40. During the current year the Special Committee on Bases of Exposure after two years work submitted a report printed in *Proceedings* No. 43. New "Recommendations for Study" were also completed, and appear in the same number.

There are two grades of membership in the Society: Fellows and Associates; while admission to either grade is in rare cases by election, in all other cases qualification is by examination, with the additional requirement of satisfactory experience in casualty insurance work. 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 311, comprising 182 Fellows and 129 Associates. The annual meeting of the Society is held in New York in November and the semi-annual meetings are held in May, usually in Baltimore, Boston, Hartford or Philadelphia. The Society twice a year issues a publication entitled the *Proceedings* which contains original papers presented at the meetings of the Society. The *Proceedings* also contain discussions of papers, reviews of books and publications, current notes and legal notes. This Year Book is published annually by the Society 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.

On November 22, 1934, the Society celebrated its twentieth anniversary. The afternoon was devoted to the presentation of addresses. In the evening a dinner followed by an entertainment by members of the Society was held. A special pamphlet containing the addresses and sketches was published and a portion of the addresses is included in *Proceedings* No. 43.

CASUALTY ACTUARIAL SOCIETY

NOVEMBER 22, 1934

THE COUNCIL

<i>*Officers:</i>	WINFIELD W. GREENE	<i>President</i>
	RALPH H. BLANCHARD	<i>Vice-President</i>
	CHARLES J. HAUGH, JR.	<i>Vice-President</i>
	RICHARD FONDILLER	<i>Secretary-Treasurer</i>
	CLARENCE W. HOBBS	<i>Editor</i>
	WILLIAM BREIBY	<i>Librarian</i>
<i>†Ex-Presidents:</i>	THOMAS F. TARBELL	1936
	PAUL DORWEILER	1938
<i>†Ex-Vice-Presidents:</i>	WILLIAM F. ROEBER	1938
	LEON S. SENIOR	1938
<i>†Elected:</i>	WILLIAM M. CORCORAN	1935
	HAROLD J. GINSBURGH	1935
	FRANCIS S. PERRYMAN	1935
	ROBERT J. McMANUS	1936
	ARNETTE R. LAWRENCE	1936
	NORTON E. MASTERSON	1936
	ARTHUR N. MATTHEWS	1937
	CHARLES G. SMITH	1937
	CLARENCE A. KULP	1937

**Terms expire at the annual meeting in November, 1935.*

†Terms expire at the annual meeting in November of the year given.

COMMITTEES

COMMITTEE ON ADMISSIONS

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MEMBERSHIP OF THE SOCIETY, NOVEMBER 22, 1934

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., Assistant Actuary, Colonial Life Insurance Company, 921 Bergen Avenue, Jersey City, N. J.
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 St., Hartford, Conn.
*Nov. 18, 1932	BARTER, JOHN L., Superintendent, Rating & Research Department, Hartford Accident & Indemnity Co., Hartford, Conn.
*Nov. 13, 1931	BATHO, ELGIN R., Assistant Actuary, Ontario Equitable Life & Accident Insurance Company, Waterloo, Ontario, Canada.
†	BENJAMIN, ROLAND, Treasurer, Fidelity & Deposit Company of Maryland and American Bonding Company, Baltimore, Md.
*Nov. 22, 1934	BERKELEY, ERNEST T., Employers Liability Insurance Corporation, Boston, Mass.
†	BLACK, S. BRUCE, President, Liberty Mutual Insurance Company, Park Square Building, 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., Senior Vice President, Maryland Casualty Company, Baltimore, Md.
May 19, 1915	BRADSHAW, THOMAS, Vice-President and General Manager, Massey-Harris Company, Limited, 915 King Street, Toronto, Canada; President, North American Life Assurance Company of Canada, Toronto, Canada.
†	BREIBY, WILLIAM, Consulting Actuary, Fackler & Breiby, 8 West 40th Street, New York.
*Nov. 18, 1927	BROWN, F. STUART, Comptroller, Fireman's Fund Indemnity Company, 116 John Street, New York.
Oct. 22, 1915	BROWN, HERBERT D., Chief of U. S. Efficiency Bureau, 1811 Lamont Street, N.W., Washington, D. C.
Oct. 22, 1915	BROWN, WILLIAM H., Vice-President and Secretary, Columbian National Life Insurance Company, 77 Franklin Street, Boston, Mass.
June 5, 1925	BROSMITH, WILLIAM, Vice-President and General Counsel, The Travelers Insurance Company and The Travelers Indemnity Company, 700 Main Street, Hartford, Conn.

FELLOWS

Date Admitted	
†	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.
Apr. 20, 1917	BURHOP, WILLIAM H., Secretary, Employers Mutual Liability Insurance Company, Wausau, Wis.
*Nov. 23, 1928	BURLING, WILLIAM H., The Travelers Insurance Company, 700 Main Street, Hartford, Conn.
Feb. 19, 1915	BURNS, F. HIGHLANDS, Chairman of the Board, Maryland Casualty Company, Baltimore, Md.
*Nov. 19, 1929	CAHILL, JAMES M., The Travelers Insurance Company, 700 Main Street, Hartford, Conn.
*Nov. 18, 1932	CAMERON, FREELAND H., American Surety Company, 744 Broad Street, Newark, N. J.
†	CAMMACK, EDMUND E., Vice-President and Actuary, Aetna Life Insurance Company, Hartford, Conn.
*Nov. 21, 1930	CARLSON, THOMAS O., Assistant Actuary, National Bureau of Casualty & Surety Underwriters, 1 Park Avenue, New York.
†	CARPENTER, RAYMOND V., Actuary, Metropolitan Life Insurance Company, 1 Madison Avenue, New York.
*Nov. 15, 1918	COATES, BARRETT N., Coates and Herfurth, Consulting Actuaries, 114 Sansome Street, San Francisco, Calif.
*Nov. 17, 1922	COATES, CLARENCE S., Lumbermen's Mutual Casualty Company, Russ Building, San Francisco, Calif.
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., Resident Secretary, Lumbermen's Mutual Casualty Company, Boston, Mass.
*Nov. 22, 1934	COOK, EDWIN A., Statistician, Interboro Mutual Indemnity Insurance Company, 50 Union Square, 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., Actuary, Metropolitan Life Insurance Company, 1 Madison Avenue, New York.
*Nov. 19, 1926	CRANE, HOWARD G., Comptroller, General Reinsurance Corporation, 90 John Street, New York.
*Nov. 18, 1932	DAVIES, E. ALFRED, Budget Supervisor, Liberty Mutual Insurance Company, Park Square Building, Boston, Mass.
*Nov. 18, 1927	DAVIS, EVELYN M., Woodward, Ryan, Sharp, Davis & Hezlett, 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., 1156 Lincoln Avenue, St. Paul, Minn.
†	DEKAY, ECKFORD C., President, Industrial Service Corporation, 84 William Street, New York.
*Nov. 17, 1920	DORWEILER, PAUL, Actuary, Accident & Liability Department, Aetna Life Insurance Company, Hartford, Conn.
May 19, 1915	DUNLAP, EARL O., Assistant Actuary, 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.
†	FACKLER, EDWARD B., Consulting Actuary, Fackler & Breiby, 8 West 40th Street, New York.
†	FALLOW, EVERETT S., Actuary, Accident Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
†	FARRER, HENRY, Chief Accountant, Insurance Company of North America, 111 John Street, New York.
Feb. 19, 1915	FELLOWS, CLAUDE W., President, Associated Indemnity Corporation, Associated Fire & Marine Insurance Co., Associated Insurance Fund, Inc., 332 Pine Street, San Francisco, Calif.
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; Actuary, Service Mutual Liability Insurance Co., Park Square Building, Boston, Mass.
Nov. 19, 1929	FOSTER, R. LEIGHTON, Superintendent of Insurance, Province of Ontario, Parliament Building, Toronto, Canada.
*Nov. 22, 1934	FULLER, GARDNER V., Assistant Secretary, National Council on Compensation Insurance, 45 East 17th Street, New York.
†	FRANKLIN, CHARLES H., Assistant to First Vice-President, Continental Casualty Co., 910 South Michigan Avenue, Chicago, Ill.
*Nov. 18, 1927	FREDERICKSON, CARL H., Actuary, Canadian Automobile and Casualty Underwriters Association, 200 Bay Street, Toronto, Canada.
Feb. 25, 1916	FROGGATT, JOSEPH, President, Joseph Froggatt & Co., Insurance Accountants, 74 Trinity Place, New York.
†	FURZE, HARRY, Treasurer, Globe Indemnity Co., 150 William Street, New York.
Feb. 19, 1915	GARRISON, FRED S., Secretary, The Travelers Indemnity Co., 700 Main Street, Hartford, Conn.
*Nov. 20, 1924	GINSBURGH, HAROLD J., Assistant Secretary, American Mutual Liability Insurance Co., 142 Berkeley Street, Boston, Mass.

FELLOWS

Date Admitted	
*Nov. 21, 1930	GLENN, J. BRYAN, Assistant Actuary, Railroad Retirement Board, Washington, D C.
May 19, 1915	GLOVER, JAMES W., Professor of Mathematics and Insurance, University of Michigan, 620 Oxford Road, Ann Arbor, Mich.
*Nov. 13, 1931	GODDARD, RUSSELL P., The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
	† GOODWIN, EDWARD S., 750 Main Street, Hartford, Conn.
	† GOULD, WILLIAM H., Consulting Actuary, 130 William Street, New York.
*Nov. 19, 1926	GRAHAM, CHARLES M., Assistant Actuary, State Insurance Fund, 625 Madison Avenue, New York.
Oct. 22, 1915	GRAHAM, GEORGE, President, Central States Life Insurance Co., 3663 Lindell Blvd., St. Louis, Mo.
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., Director of Publications, Washington National Insurance Co., 1737 Howard St., Chicago, Ill.
	† GREENE, WINFIELD W., Vice-President and Secretary, General Reinsurance Corporation, 90 John Street, New York.
	† HAMILTON, ROBERT C. L., Comptroller, Hartford Accident & Indemnity Co., 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., Member, State Industrial Board, 80 Centre Street, New York.
*Nov. 19, 1926	HAUGH, CHARLES J., JR., Actuary, National Bureau of Casualty & Surety Underwriters, 1 Park Avenue, 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, Vice-President and Actuary, Equitable Life Assurance Society, 393 Seventh Avenue, New York.
May 17, 1922	HERON, DAVID, Secretary and Chief Statistician, London Guarantee & Accident Co., Ltd., 20 Lincoln's Inn Fields, London, W. C. 2, England.
	† HILLAS, ROBERT J., (Retired) 2 Whippany Road, Morristown, N. J.
May 23, 1924	HOBBS, CLARENCE W., Special Representative of the National Convention of Insurance Commissioners, National Council on Compensation Insurance, 45 East 17th Street, New York.
Nov. 19, 1926	HODGES, CHARLES E., President, American Mutual Liability Insurance Co., Allied American Mutual Automobile Insurance Co., American Policyholders' Insurance Co., 142 Berkeley Street, Boston, Mass.
Oct. 22, 1915	HODGKINS, LEMUEL G., Secretary, Massachusetts Protective Association and Massachusetts Protective Life Assurance Co., Worcester, Mass.

FELLOWS

Date Admitted	
†	HOFFMAN, FREDERICK L., Consulting Statistician, Prudential Insurance Co., Research Consultant, Babson Institute, Wellesley Hills, Mass.; Director of Research Aviation Business Bureau, Inc., 72 Wall Street, New York.
Oct. 22, 1915	HOLLAND, CHARLES H., Room 1406, 9 East 44th Street, New York.
*Nov. 22, 1934	HOOVER, RUSSELL O., Actuary, Connecticut Insurance Department, Hartford, Conn.
Nov. 18, 1932	HUEBNER, SOLOMON S., Professor of Insurance, University of Pennsylvania, Philadelphia, Pa.
†	HUGHES, CHARLES, Auditor and Actuary, New York Insurance Department, 80 Centre Street, New York.
Nov. 19, 1929	HULL, ROBERT S., Title and Mortgage Company of Westchester County, 235 Main Street, White Plains, N. Y.
†	HUNT, BURRITT A., Assistant Secretary, Accident and Liability Department, Aetna Life Insurance 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 Insurance Co., Worcester, Mass.
Nov. 23, 1928	JONES, F. ROBERTSON, General Manager, Association of Casualty and Surety Executives; and Secretary-Treasurer, Bureau of Personal Accident and Health Underwriters, 1 Park Avenue, New York.
*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, Associate Actuary, Compensation Insurance Rating Board, 370 Seventh 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, Connecticut General Life Insurance Co., 55 Elm Street, Hartford, Conn.
Nov. 13, 1931	LA MONT, STEWART M., Third Vice-President, Metropolitan Life Insurance Co., 1 Madison Avenue, New York.
*Nov. 24, 1933	LANGE, JOHN R., Chief Actuary, Wisconsin Insurance Department, State House, Madison, Wis.
* †	LEAL, JAMES R., Vice-President and Secretary, Interstate Life and Accident Co., Interstate Building, 540 McCallie Avenue, Chattanooga, Tenn.
†	LESLIE, WILLIAM, Associate General Manager, National Bureau of Casualty & Surety Underwriters, 1 Park Avenue, New York.

FELLOWS

Date Admitted	
*Nov. 20, 1924	LINDER, JOSEPH, Consulting Actuary, c/o S. H. and Lee J. Wolfe, 116 John Street, New York.
Nov. 18, 1921	LITTLE, JAMES F., Vice-President and Actuary, Prudential Insurance Co., Newark, N. J.
Nov. 23, 1928	LUNT, EDWARD C., Vice-President, Great American Indemnity Co., 1 Liberty Street, New York.
†	MAGOUN, WILLIAM N., General Manager, Massachusetts Rating and Inspection Bureau, 89 Broad Street, Boston, Mass.
*Nov. 23, 1928	MARSHALL, RALPH M., 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. 17, 1922	LAWRENCE, ARNETTE R., Special Deputy Commissioner of Banking and Insurance, 1203 Military Park Building, 60 Park Place, Newark, N. J.
*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.
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.
†	MILLER, DAVID W., Comptroller, Title and Mortgage Company of Westchester County, 235 Main Street, White Plains, N. Y.
†	MILLIGAN, SAMUEL, Third Vice-President, Metropolitan Life Insurance Co., 1 Madison Avenue, New York.
†	MITCHELL, JAMES F., Assistant U. S. Manager, General Accident Fire and Life Assurance Corporation, Ltd., 414 Walnut Street, Philadelphia, Pa.
†	MOIR, HENRY, President, United States Life Insurance Co., 156 Fifth Avenue, New York.
*Nov. 18, 1921	MONTGOMERY, VICTOR, President, Pacific Employers Insurance Co., 928 So. Figueroa Street, Los Angeles, Calif.
Nov. 19, 1926	MOONEY, WILLIAM L., Vice-President, Aetna Life Insurance Co., Hartford, Conn.
†	MOORE, GEORGE D., Comptroller, Standard Surety & Casualty Company of New York, 80 John Street, New York.
†	MORRISON, JAMES, C. & R. Bronx Corporation, Insurance Brokers, 349 East 149th Street, New York.
†	MOWBRAY, ALBERT H., Consulting Actuary, 806 San Luis Road, Berkeley, Calif.
*Nov. 17, 1920	MUELLER, LOUIS H., Resident Executive, United Air Lines, 320 Geary Street, San Francisco, Calif.
†	MULLANEY, FRANK R., Secretary, American Mutual Liability Insurance Co., and American Policyholders' Insurance Co., 142 Berkeley Street, Boston, Mass.

FELLOWS

Date Admitted	
May 28, 1920	MURPHY, RAY D., Vice-President, Equitable Life Assurance Society, 393 Seventh Avenue, New York.
†	NICHOLAS, LEWIS A., Assistant Secretary, Fidelity & Casualty Co., 80 Maiden Lane, 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.
†	OTIS, STANLEY L., Counsellor at Law, Manager, Otis Service, 90 John Street, New York.
*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., Assistant Secretary, Compensation and Liability Department, 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, 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., Actuary and Assistant Treasurer, Pennsylvania Indemnity Corporation, Atlantic Building, Philadelphia, Pa.
May 13, 1927	REID, A. DUNCAN, President and General Manager, Globe Indemnity Co., 150 William Street, New York.
†	REMINGTON, CHARLES H., Alden House, Larchmont, N. Y.
May 23, 1919	RICHARDSON, FREDERICK, U. S. Manager and Director, General Accident Fire and Life Assurance Corporation, 414 Walnut Street, Philadelphia, Pa.
*Nov. 19, 1926	RICHTER, OTTO C., American Telephone & Telegraph Co., 195 Broadway, New York.
May 24, 1921	RIEDEL, ROBERT, Professor of Statistics and Insurance, University of Buffalo, Buffalo, New York.
*Nov. 16, 1923	ROEBER, WILLIAM F., General Manager, National Council on Compensation Insurance, 45 East 17th Street, New York.
†	RUBINOW, ISAAC M., Secretary, Independent Order of B'nai B'rith, 40 Electric Bldg., Cincinnati, O.
†	SCHWEITLIN, E., Assistant Treasurer, Globe Indemnity Co., 150 William Street, New York.
†	SENIOR, LEON S., General Manager, Compensation Insurance Rating Board, 370 Seventh Avenue, New York.
*Nov. 13, 1931	SILVERMAN, DAVID, c/o S. H. & Lee J. Wolfe, 116 John Street, New York.

FELLOWS

Date Admitted	
*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., Office of S. H. and Lee J. Wolfe, Consulting Actuaries, 116 John Street, New York.
*Nov. 18, 1932	SMICK, JACK J., National Council on Compensation Insurance, 45 East 17th Street, New York.
Apr. 20, 1917	SMITH, CHARLES G., Manager, State Insurance Fund, 625 Madison Avenue, New York.
*Nov. 24, 1933	ST. JOHN, JOHN B., Metropolitan Life Insurance Company, 1 Madison Avenue, New York.
Nov. 18, 1927	STONE, EDWARD C., U. S. Manager, 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.
*Nov. 17, 1920	WAITE, ALAN W., Chief Underwriter, Accident and Liability Department, Aetna Life Insurance Co., Hartford, Conn.
*Nov. 18, 1925	WARREN, LLOYD A. H., Professor of Mathematics, University of Manitoba, 64 Niagara Street, Winnipeg, Manitoba, Canada.
May 23, 1919	WELCH, ARCHIBALD A., President, Phoenix Mutual Life Insurance Co., Hartford, Conn.
†	WHITNEY, ALBERT W., Associate General Manager, National Bureau of Casualty & Surety Underwriters, 1 Park Avenue, New York.
*Nov. 13, 1931	WITTICK, HERBERT E., Assistant Secretary, Pilot Insurance Co., 159 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., 229 East Benedict Avenue, Upper Darby, Pa.

ASSOCIATES

Those marked (*) have been enrolled as Associates upon examination by the Society.

Those marked (†) or (‡) have passed Parts I and II or Parts III and IV of the Fellowship Examination.

Date Enrolled	
May 23, 1924	ACKER, MILTON, Manager, Compensation and Liability Department, National Bureau of Casualty and Surety Underwriters, 1 Park Avenue, New York.
*Nov. 15, 1918	ACKERMAN, SAUL B., Professor of Insurance, New York University, 90 Trinity Place, New York.
Apr. 5, 1928	ALLEN, AUSTIN F., Vice-President, 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.
*Nov. 24, 1933	BARRON, JAMES JR., General Reinsurance Corporation, 90 John Street, New York.
(†)*Nov.23,1928	BATEMAN, ARTHUR E., Liberty Mutual Insurance Company, Park Square Building, Boston, Mass.
*Nov. 18, 1925	BITTEL, W. HAROLD, Associate Actuary, Woodward, Ryan, Sharp, Davis & Hezlett, 90 John Street, New York.
Nov. 17, 1920	BLACK, NELLAS C., Superintendent Statistical Division, Maryland Casualty Co., Baltimore, Md.
*Nov. 22, 1934	BOMSE, E. L., American Mutual Alliance, 60 East 42nd Street, New York.
*Nov. 23, 1928	BOWER, PERRY S., Great West Life Assurance Company, Winnipeg, Manitoba, Canada.
Nov. 20, 1924	BROUGHTON, THOMAS W., 629 11th Street, Brooklyn, N. Y.
*Nov. 15, 1918	BRUNNQUELL, HELMUTH G., Assistant Actuary, The Northwestern Mutual Life Insurance Co., Milwaukee, Wis.
*Oct. 22, 1915	BUFFLER, LOUIS, District Manager, Utica Mutual Insurance Co., 907 Chrysler Building, New York.
*Nov. 20, 1924	BUGBEE, JAMES M., 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., Executive Vice-President and Actuary, Federal Life Insurance Co., 166 N. Michigan Blvd., Chicago, Ill.
*Nov. 18, 1927	CHEN, S. T., Actuarial Department, China United Assurance Society, 104 Bubbling Well Road, Shanghai, China.
*Nov. 18, 1927	CONROD, STUART F., Somerset Block, Winnipeg, Canada.
May 23, 1929	COWEE, GEORGE A., Vice-President, Liberty Mutual Insurance Co., Park Square Building, Boston, Mass.
(†)*Nov.24,1933	CRAWFORD, WILLIAM H., Assistant Secretary, Commercial Casualty Insurance Company and Metropolitan Casualty Insurance Company of New York, 10 Park Place, Newark, N. J.

ASSOCIATES

Date Enrolled	
*Nov. 18, 1932	CRIMMINS, JOSEPH B., Metropolitan Life Insurance Co., 1 Madison Avenue, New York.
*Nov. 18, 1925	DAVIS, MALVIN E., Assistant Actuary, Metropolitan Life Insurance Co., 1 Madison Avenue, New York.
(1)*Nov.24,1933	DAVIS, REGINALD S., Assistant Comptroller, State Compensation Insurance Fund, San Francisco, Calif.
*Nov. 24, 1933	DIGIULIO, LOUIS A., 67 Kensington Avenue, Meriden, Conn.
May 25, 1923	ECONOMIDY, HARILAU E., Senior Examiner, Board of Insurance Commissioners, Austin, Texas.
June 5, 1925	EGER, FRANK A., Secretary-Comptroller, Insurance Company of North America and Affiliated Companies, 1600 Arch Street, Philadelphia, Pa.
*Nov. 22, 1934	EPPINK, WALTER T., Assistant Secretary-Assistant Treasurer, Merchants Mutual Casualty Co., 268 Main Street, Buffalo, N. Y.
*Nov. 23, 1928	FAITH, EDWARD L., General American Life Insurance Co., 1501 Locust Street, St. Louis, Mo.
(1)*Nov.16,1923	FITZ, L. LEROY, Consulting Actuary, 176 Federal Street, Boston, Mass.
(1)*Nov.18,1927	FITZGERALD, A. H., Assistant Actuary, The Prudential Insurance Company of America, Newark, N. J.
*Nov. 22, 1934	FITZHUGH, GILBERT W., Metropolitan Life Insurance Company, 1 Madison Avenue, New York.
*Nov. 16, 1923	FLEMING, FRANK A., Actuary, American Mutual Alliance, 60 East 42nd Street, New York.
Nov. 20, 1924	FROBERG, JOHN, Superintendent, California Inspection Rating Bureau, 114 Sansome Street, San Francisco, Calif.
(1)*Nov.19,1929	FURNIVALL, MAURICE L., Assistant Actuary, Accident Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
Mar. 21, 1930	GALLON, RICHARD W., Vice-President, New Amsterdam Casualty Co., 227 St. Paul Street, Baltimore, Md.
(1)*Nov.13,1931	GARWOOD, MORRIE L., Kemper Insurance Organization, 88 Lexington Avenue, New York.
*Nov. 22, 1934	GATELY, JOHN J., General Reinsurance Corporation, 90 John Street, New York.
(1)*Nov.18,1932	GETMAN, RICHARD A., Life Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
*Nov. 17, 1922	GIBSON, JOSEPH P., JR., Vice-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., Illinois Insurance Department, Springfield, Ill.
*Nov. 18, 1921	HAGGARD, ROBERT E., Superintendent, Permanent Disability Rating Department, Industrial Accident Commission, State Building, San Francisco, Calif.
*Nov. 17, 1922	HALL, HARTWELL L., Associate Actuary, Connecticut Insurance Department, Hartford, Conn.
(3)*Nov.18,1925	HALL, WILLIAM D., Actuary, National Automobile Underwriters Association, 1 Liberty Street, New York.

ASSOCIATES

Date Enrolled	
Mar. 24, 1932	HARRIS, SCOTT, Vice-President, Joseph Froggatt & Co., 74 Trinity Place, New York.
(1)*Mar.25,1924	HART, WARD VAN BUREN, Assistant Actuary, Connecticut General Life Insurance Co., Hartford, Conn.
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.
*Oct. 31, 1917	JACKSON, EDWARD T., Statistician, General Accident Fire & Life Assurance Corporation, 421 Walnut Street, Philadelphia, Pa.
Nov. 19, 1929	JACOBS, CARL N., President, Hardware Mutual Casualty Co., Stevens Point, Wis.
(2)*Nov.18,1921	JENSEN, EDWARD S., Actuary, Great Republic Life Insurance Co., 8th and Spring Streets, Los Angeles, Calif.
Nov. 21, 1930	JONES, H. LLOYD, Assistant Manager, London Guarantee & Accident Co., 55 Fifth Avenue, New York.
*Nov. 21, 1919	JONES, LORING D., Assistant Manager, State Insurance Fund, 625 Madison Avenue, New York.
*Nov. 17, 1922	KIRK, CARL L., Actuary, Zurich General Accident & Liability Insurance Co., 431 Insurance Exchange, Chicago, Ill.
*Nov. 18, 1932	LEWIS, HOWARD A., 41 Huntington Street, Hartford, Conn.
*Nov. 23, 1928	LIPKIND, SAUL S., Reliance Life Insurance Company, Pittsburgh, Pa.
(1)*Nov.13,1931	LYONS, DANIEL J., Chief Assistant Actuary, Department of Banking and Insurance, Trenton, N. J.
(1)*Nov.13,1931	MACKEEN, HAROLD E., The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
Mar. 24, 1932	MAGRATH, JOSEPH J., Chief of Rating Bureau, New York Insurance Department, 80 Centre 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. 22, 1934	MCCONNELL, M. H., JR., National Council on Compensation Insurance, 45 East 17th Street, New York.
*Nov. 17, 1922	MCIVER, ROSSWELL A., Actuary, Washington National Insurance Co., 1737 Howard Street, Chicago, Ill.
(1)*Nov.17,1922	MICHENER, SAMUEL M., Assistant Actuary, Columbus Mutual Life Insurance Co., 580 East Broad Street, Columbus, Ohio.
(1)*Nov.13,1931	MILLER, HENRY C., Comptroller, State Compensation Insurance Fund, 450 McAllister Street, San Francisco, Calif.
(1)*Nov.21,1930	MILLER, JOHN H., Actuary, Monarch Life Insurance Co., Springfield, Mass.
*Nov. 19, 1926	MILNE, JOHN L., Actuary, Presbyterian Ministers' Fund for Life Insurance, 1805 Walnut Street, Philadelphia, Pa.
Nov. 17, 1922	MONTGOMERY, JOHN C., Secretary and Assistant Treasurer, Bankers Indemnity Insurance Co., 15 Washington Street, Newark, N. J.

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ASSOCIATES

Date Enrolled	
May 25, 1923	MOORE, JOSEPH P., President, North American Accident Insurance Co., 275 Craig Street, W., Montreal, Canada.
(2)*Nov.21,1919	MOTHERSILL, ROLAND V., Executive Vice President and Secretary, Anchor Casualty Co., Anchor Insurance Building, St. Paul, Minn.
*Nov. 19, 1929	MULLER, FRITZ, Secretary-Treasurer, Agrippina Life Insurance Stock Co., Berlin, W. 30 Motzstr. 3, Germany.
(1)*Oct.27,1916	NEWELL, WILLIAM, Assistant Secretary, Sun Indemnity Co., 55 Fifth Avenue, New York.
*Nov. 23, 1928	NEWHALL, KARL, Group Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
*Nov. 18, 1925	NICHOLSON, EARL H., Actuary, Equitable Reserve Association, Neenah, Wis.
(1)*Nov.13,1931	OBERHAUS, Thomas M., Office of Woodward and Fondiller, Consulting Actuaries, 90 John Street, New York.
May 23, 1919	OTTO, WALTER E., Secretary-Treasurer, Michigan Mutual Liability Co., 1209 Washington Blvd., Detroit, Mich.
*Nov. 19, 1926	OVERHOLSER, DONALD M., 803 East 35th Street, Brooklyn, N. Y.
Nov. 20, 1924	PENNOCK, RICHARD M., Actuary, Pennsylvania Manufacturers Association Casualty Insurance Co., Finance Building, Philadelphia, Pa.
Nov. 19, 1929	PHILLIPS, JOHN H., Employers' Mutual Liability Insurance Co., Wausau, Wis.
*Nov. 17, 1920	PIKE, MORRIS, Vice-President and Actuary, Union Labor Life Insurance Co., Machinists Building, Mount Vernon Place, Washington, D. C.
Mar. 24, 1927	PIPER, JOHN W., Superintendent of Statistical Department, Hartford Accident & Indemnity Co., 690 Asylum Avenue, Hartford, Conn.
(1)*Nov.23,1928	PIPER, KENNETH B., Secretary-Actuary, Life Dept. Provident Life and Accident Insurance Co., Chattanooga, Tenn.
*Nov. 18, 1927	POISSANT, WILLIAM A., The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
(1)*Nov.17,1922	POORMAN, WILLIAM F., Vice-President and Actuary, Central Life Assurance Society, Fifth and Grand Avenues, Des Moines, Iowa.
(1)Nov. 17, 1922	POWELL, JOHN M., President, The Loyal Protective Insurance Co., 38 Newberry St., Boston, Mass.
*Nov. 15, 1918	RAYWID, JOSEPH, President, Joseph Raywid & Co., Inc., 90 William Street, New York.
Nov. 19, 1929	RICHARDSON, HARRY F., Secretary-Treasurer, National Council on Compensation Insurance, 45 East 17th Street, New York.
(1)*Nov.18,1932	ROBERTS, JAMES A., Life Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
(1)*Nov.21,1919	ROBBINS, RAINARD B., Secretary and Actuary for Annuities, Teachers Insurance and Annuity Association, 522 Fifth Avenue, New York.
*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.

ASSOCIATES

Date Enrolled	
*Nov. 20, 1930	SEVILLA, EXEQUIEL S., Actuary, National Life Insurance Co., P. O. Box 2856, Manila, Philippine Islands.
(¹)*Nov.20,1924	SHEPPARD, NORRIS E., Lecturer in Mathematics and Mechanics, University of Toronto, Toronto, Canada.
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 and Actuary, Compensation Insurance Rating Board, 370 Seventh Avenue, New York.
(¹)*Nov.19,1926	SOMERVILLE, WILLIAM F., St. Paul Mercury Indemnity Co., St. Paul, Minn.
*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, 1923	STOKE, KENDRICK, Michigan Mutual Liability Company, 1209 Washington Blvd., Detroit, Mich.
*Nov. 21, 1930	SULLIVAN, WALTER F., Associated Indemnity Corporation, 332 Pine Street, San Francisco, Calif.
(¹)*Nov.19,1929	TAHENY, JOHN J., Counsellor at Law, 155 Sansome Street, San Francisco, Calif.
Mar. 23, 1921	THOMPSON, ARTHUR E., Chief Statistician, Globe Indemnity Co., 150 William Street, New York.
*Nov. 22, 1934	THOMPSON, WALTER H., Kemper Insurance Organization, 4750 Sheridan Avenue, Chicago, Ill.
(¹)*Nov.21,1919	TRENCH, FREDERICK H., Manager, Underwriting Department, Utica Mutual Insurance Co., 185 Genesee Street, Utica, N. Y.
(¹)*Nov.20,1924	UHL, M. ELIZABETH, National Bureau of Casualty & Surety Underwriters, 1 Park Avenue, New York.
*Nov. 21, 1919	VOOGT, WALTER G., Treasurer, Associated Indemnity Corporation, 332 Pine Street, San Francisco, Calif.
(¹)*Oct.27,1916	WAITE, HARRY V., Statistician, The Travelers Fire Insurance Co., 700 Main Street, Hartford, Conn.
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., Consulting Actuary, 2004 West End Ave., Nashville, Tenn.
(¹)*Nov.18,1921	WATERS, LELAND L., Secretary-Treasurer, National Assurance Corporation, Lincoln, Neb.
Nov. 17, 1920	WATSON, J. J., Resident Vice-President, American Indemnity Co., and Texas Indemnity Insurance Co., 1307 Kirby Building, Dallas, Texas.
*Nov. 18, 1932	WEINSTEIN, M. 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.

ASSOCIATES

Date Enrolled	
*Nov. 18, 1925	WELLMAN, ALEXANDER C., Vice-President and Actuary, Protective Life Insurance Co., Birmingham, Ala.
(¹)*Nov.21,1930	WELLS, WALTER I., Supervisor of Applications, Massachusetts Protective Association, Worcester, Mass.
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.
*Nov. 22, 1934	WILLIAMS, H. V., JR., National Council on Compensation Insurance, 45 East 17th Street, New York.
*Oct. 22, 1915	WILLIAMSON, WILLIAM R., Assistant Actuary, Life Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
*Oct. 22, 1915	WOOD, DONALD M., Childs & Wood, General Agents, Royal Indemnity Company, 175 W. 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., New York Insurance Department, 80 Centre Street, New York.
*Nov. 18, 1925	WOOLERY, JAMES M., Actuary, Southeastern Life Insurance Co., Greenville, S. C.
*Nov. 17, 1922	YOUNG, FLOYD E., Actuary, Montana Life Insurance Co., Helena, Montana.

SCHEDULE OF MEMBERSHIP, NOVEMBER 22, 1934

	Fellows	Associates	Total
Membership, November 24, 1933.....	181	128	309
Additions:			
By election.....	5	8	13
By examination.....			
	186	136	322
Deductions:			
By death.....	3		3
By withdrawal.....	1	2	3
By transfers from Associate to Fellow....		5	5
Membership, November 22, 1934.....	182	129	311

EX-PRESIDENTS AND EX-VICE-PRESIDENTS

EX-PRESIDENTS

	Term
I. M. RUBINOW.....	1914-1916
JAMES D. CRAIG.....	1916-1918
*JOSEPH H. WOODWARD.....	1918-1919
BENEDICT D. FLYNN.....	1919-1920
ALBERT H. MOWBRAY.....	1920-1922
*HARWOOD E. RYAN.....	1922-1923
WILLIAM LESLIE.....	1923-1924
G. F. MICHELbacher.....	1924-1926
SANFORD B. PERKINS.....	1926-1928
GEORGE D. MOORE.....	1928-1930
THOMAS F. TARBELL.....	1930-1932
PAUL DORWEILER.....	1932-1934

EX-VICE-PRESIDENTS

	Term
LEON S. SENIOR.....	1920-1922, 1932-1934
EDMUND E. CAMMACK.....	1922-1924
RALPH H. BLANCHARD.....	1924-1926
SYDNEY D. PINNEY.....	1928-1930
*ROY A. WHEELER.....	1930-1932
WILLIAM F. ROEBER.....	1932-1934

*Deceased

DECEASED FELLOWS

Date of Death	
June 4, 1934	BUDLONG, WILLIAM A., Superintendent of Claims, Commercial Travelers Mutual Accident Association, Utica, N. Y.
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 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.
Mar. 18, 1932	HINSDALE, FRANK WEBSTER, Secretary, Workmen's Compensation Board, Vancouver, B. C., Canada.
Mar. 10, 1924	HOOKESTADT, 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.
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.
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.
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.
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.
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.
Feb. 25, 1933	TOJA, GUIDO, Director General, Institute Nazionale Delle Assicurazioni, Rome, Italy.
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.
Dec. 20, 1920	LUBIN, HARRY, Assistant Actuary, State Industrial Commission, New York.
June 11, 1930	WILKINSON, ALBERT EDWARD, Actuary, Standard Accident Insurance Co., Detroit, Mich.

STUDENTS

Parts I, II, III and IV Passed

The following candidates have been successful in completing the examinations for Associate but have not yet been enrolled as Associates of the Society by reason of the terms of examination rule 4 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:

- ARTHUR, CHARLES R., Manufacturers Life Insurance Company, 100 Bloor St., E., Toronto, Ontario, Canada.
- BAILEY, ROBERT C., Sovereign Life Assurance Co., Winnipeg, Manitoba, Canada.
- BAKER, ROBERT W., Manufacturers Life Insurance Company, 100 Bloor St., E., Toronto, Ontario, Canada.
- BATHO, BRUCE, Franklin Life Insurance Company, Springfield, Ill.
- BRERETON, C. R., Department of Insurance, Ottawa, Ontario, Canada.
- BROCK, STANLEY E., Ontario Equitable Life & Accident Insurance Co., Waterloo, Ontario, Canada.
- CAMPBELL, GEORGE C., Metropolitan Life Insurance Company, 1 Madison Ave., New York City.
- CANNON, LESLIE A., Great West Life Assurance Company, Winnipeg, Manitoba, Canada.
- CHODORCOFF, WILLIAM, Prudential Insurance Company, Newark, N. J.
- CLEARY, ARTHUR E., American Mutual Liability Insurance Co., 76 Westminster St., Providence, R. I.
- FELDMAN, ISRAEL, Metropolitan Life Insurance Company, Ottawa, Ontario, Canada.
- FOOTE, JEAN VIVIAN, 42 Hochelaga St., W., Moose Jaw, Sask., Canada.
- GODDARD, DAVID G., The Travelers Insurance Company, Hartford, Conn.
- HIBBARD, DONALD L., One Shaler Lane, Cambridge, Mass.
- JONES, CHARLES H., Metropolitan Life Insurance Company, 1 Madison Ave., New York City.
- KARDONSKY, ELSIE, Compensation Insurance Rating Board, 370 Seventh Avenue, New York.
- KNOWLES, FREDERICK, Montreal Life Insurance Company, 625 Burnside Place, Montreal, Quebec, Canada.
- KWASHA, HERMAN, The Travelers Insurance Company, Hartford, Conn.
- LAING, CHARLES B., Prudential Insurance Company, Newark, N. J.
- LAIRD, W. DARRELL, Great West Life Assurance Company, Winnipeg, Manitoba, Canada.
- LEARSON, RICHARD J., Associate Actuary, Western & Southern Life Insurance Company, Cincinnati, Ohio.
- LEHANE, LEO J., Central Life Insurance Company, Chicago, Ill.
- LEWIS, BARNET, 3912 Laval Street, Montreal, Canada.
- LOADMAN, ARTHUR E., 665 Elgin Ave., Winnipeg, Manitoba, Canada.
- MOORE, HAROLD P. H., Great West Life Assurance Company, Winnipeg, Manitoba, Canada.
- MULLANS, G. ROBERT, The Travelers Insurance Company, Hartford, Conn.

STUDENTS

- MUTH, A. F., Actuarial Department, London Life Insurance Company, London, Canada.
- ORLOFF, CONRAD, Prudential Insurance Company, Newark, N. J.
- PRASOW, ROSE, Actuarial Department, Confederation Life Association, Toronto, Ontario, Canada.
- RINTOUL, JOHN W., Canada Life Assurance Company, Toronto, Ontario, Canada.
- ROBERTSON, ARTHUR G., Government Insurance Department, Ottawa, Ontario, Canada.
- ROOD, HENRY F., Lincoln National Life Insurance Company, Fort Wayne, Ind.
- SCHWARTZ, RICHARD T., Actuarial Department, New York Life Insurance Co., 51 Madison Ave., New York.
- SPELLER, S. I., Illinois Bankers Life Assurance Company, Monmouth, Ill.
- SUTHERLAND, HENRY M., Actuarial Department, Sun Life Assurance Company, Montreal, Canada.
- THOMPSON, EMERSON W., The Travelers Insurance Company, Hartford, Conn.
- WALL, DEAN, Actuarial Department, General American Life Insurance Company, St. Louis, Mo.
- WARD, ROBERT G., Columbian National Life Insurance Co., Boston, Mass.
- WILSON, JOHN F., Manufacturers Life Insurance Company, Toronto, Canada.
- WOLFMAN, MAURICE, 485 Pritchard Ave., Winnipeg, Manitoba, Canada.
- YATES, J. ARNOLD, The Travelers Insurance Company, Hartford, Conn.
- YOUNG, WALTER, Prudential Insurance Company, Newark, N. J.

The examinations for the grade of Associate consist of four parts. The following candidates have passed the parts shown, during the last three years.

Part I

- BELL, CODIE D., Benefit Association of Railway Employees, 901 Montrose Ave., Chicago, Ill.
- DANIELS, ARTHUR C., Office of Fackler & Breiby, 8 West 40th St., New York.
- GLAZIER, RICHARD L., Union Central Life Insurance Company, Cincinnati, Ohio.
- GOZZI, DANTE, American Mutual Liability Insurance Company, 142 Berkeley St., Boston, Mass.
- JONES, HAROLD M., Liberty Mutual Insurance Company, Park Square Bldg., Boston, Mass.
- LLOYD, WILLIAM M., Travelers Insurance Company, Hartford, Conn.
- NELSON, S. TYLER, Utica Mutual Insurance Company, Utica, N. Y.
- ROSECRANS, GORDON R., Primghar, Iowa.
- ROSENQUIST, ROY, Travelers Insurance Company, 175 W. Jackson Boulevard, Chicago, Ill.
- SHAPIRO, GEORGE I., 1667 Ocean Parkway, Brooklyn, N. Y.
- WOOD, R. GRAHAM, The Travelers Insurance Company, Hartford, Conn.

Part II

- BELL, CODIE D., Benefit Association of Railway Employees, 901 Montrose Ave., Chicago, Ill.
- COLEMAN, MARY, (American) Lumbermen's Mutual Casualty Company, Chicago, Ill.
- DANIELS, ARTHUR C., Office of Fackler & Breiby, 8 West 40th Street, New York.
- EMERSON, JOHN F., Hartford Accident & Indemnity Company, 720 California St., San Francisco, Calif.
- FISBECK, FRANCES C., 40 Highland Place, Ridgefield Park, N. J.
- FURSA, CHARLES A., National Bureau of Casualty & Surety Underwriters, 1 Park Ave., New York.
- GARRETT, HAROLD E., Compensation Insurance Rating Board, 370 Seventh Ave., New York.
- GIROUX, PAUL-EMILE, Sun Insurance Company, 276 St. James St., West, Montreal, Canada.
- JONES, HAROLD M., Liberty Mutual Insurance Company, Park Square Bldg., Boston, Mass.
- NELSON, S. TYLER, Utica Mutual Insurance Company, Utica, N. Y.
- NOWAK, L. EDWARD, New York Insurance Department, 80 Centre Street, New York.
- ROSECRANS, GORDON R., Primghar, Iowa.
- SAYER, EDWARD D., General Reinsurance Corporation, 90 John Street, New York.
- SHAPIRO, GEORGE I., 1667 Ocean Parkway, Brooklyn, N. Y.
- WALSH, JAMES V., Travelers Insurance Company, Hartford, Conn.
- WOOD, R. GRAHAM, The Travelers Insurance Company, Hartford, Conn.

Part III

- COHEN, ABRAHAM J., New York State Labor Department, 80 Centre St., New York.
- CARROLL, EDWARD F., JR., Prudential Insurance Company, Newark, N. J.
- DANIELS, ARTHUR C., Office of Fackler & Breiby, 8 West 40th Street, New York.
- GLAZIER, RICHARD L., Union Central Life Insurance Company, Cincinnati, Ohio.
- MILLS, J. A., (American) Lumbermen's Mutual Casualty Company, Chicago, Ill.
- MOSCOVITCH, NATHAN A., 90 Monck Avenue, Norwood, Manitoba, Canada.
- PRINZ, RAYMOND F., Prudential Insurance Company, Newark, N. J.
- SHAPIRO, GEORGE I., 1667 Ocean Parkway, Brooklyn, N. Y.

Part IV

- CARROLL, EDWARD F., JR., Prudential Insurance Company, Newark, N. J.
- GLAZIER, RICHARD L., Union Central Life Insurance Company, Cincinnati, Ohio.
- MOSCOVITCH, NATHAN A., 90 Monck Avenue, Norwood, Manitoba, Canada.
- PRINZ, RAYMOND F., Prudential Insurance Company, Newark, N. J.

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.

CONSTITUTION

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 MAY 21, 1926)

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.

BY-LAWS

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.

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*
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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 candidates by the Society.

EXAMINATION REQUIREMENTS

RULES REGARDING EXAMINATIONS FOR
ADMISSION TO THE SOCIETY

(AS AMENDED FEBRUARY 27, 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. Candidates electing this alternative should communicate with the Secretary-Treasurer as to the approval of the subject chosen. 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*.

In order to assist students preparing to take the examinations for Associateship, the answers to the examination questions in past years have been prepared and may be had at cost upon application to the Secretary-Treasurer.

1934 EXAMINATIONS OF THE SOCIETY

MAY 16 AND 17, 1934

EXAMINATION COMMITTEE
ARTHUR N. MATTHEWS, GENERAL CHAIRMAN

IN CHARGE OF
ASSOCIATESHIP EXAMINATIONS
RALPH M. MARSHALL, CHAIRMAN
JAMES M. CAHILL
DAVID SILVERMAN

IN CHARGE OF
FELLOWSHIP EXAMINATIONS
ALBERT Z. SKELDING, CHAIRMAN
FRANCIS S. PERRYMAN
THOMAS O. CARLSON

EXAMINATION FOR ADMISSION AS ASSOCIATE

PART I

- Solve the equation $(7 - 4\sqrt{3})x^2 + (2 - \sqrt{3})x = 2$
 - Find the term independent of x in the expansion of
$$\left(\frac{3}{2}x^2 - \frac{1}{3x}\right)^9$$
- Three men A, B, and C throw dice simultaneously upon the condition that he who makes the lowest throw shall give to the others the sum each has already. Each loses in turn in the order named, and at the end of the third game each has eight dollars. How much had each to begin with?
- Find the sum of $2n$ terms of a series of which every even term is " a " times the term before it, and every odd term is " c " times the term before it, the first term being unity.
 - Find the value of $\log_{10} [(2.7)^3 (.81)^{\frac{4}{3}}] + \log_3 10$.
Given $\log_{10} 3 = .4771$.
- Six papers are set in examination, two of them in mathematics. In how many different orders can the papers be given, provided that the two mathematical papers are not given successively.
 - Ten similar presents are to be distributed among six children so that each child receives at least one present. In how many ways can the distribution be made?

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5. A debt of 10,000 dollars is to be repaid principal and interest at 5 percent annually in a series of equal payments at the end of each year for 30 years. Find the annual payment and the amount of capital in the 16th payment. Given $v^{15} = .4810$; $v^{30} = .2314$.
6. A debt of 10,000 dollars is to be paid off by annual payments in ten years. Interest will be charged against the outstanding principal at the rate of 6 percent during the first five years and at the rate of 3 percent during the second five years. The annual payments for the first five years are all equal and each is equal to one-half the annual payment during the second five years. What is the amount of the first installment payable at the end of the first year? Given $(1.06)^5 = 1.3382$; $(1.03)^5 = 1.1593$.
7. (a) An annuity pays 25 at the end of year 1, 24 at the end of year 2, etc., the amount decreasing by 1 each year until the final payment of 1. Show that the present value equals $\frac{25 - a_{\overline{25}|i}}$
- (b) Prove $\frac{1}{a_{\overline{n}|i}} = \frac{1}{s_{\overline{n}|i}} + i$
8. The interior of a room can be painted at a cost of ten dollars and must be repainted every two years. If money is worth six percent, how much could one afford to pay for papering the room instead, if paper would need renewal every three years? Given $(1.06)^2 = 1.1236$; $(1.06)^3 = 1.1910$.

PART II

1. Describe and explain briefly various statistical methods which may be used to compare two frequency distributions.
2. (a) What is a "line of regression" and how is it determined? What is the significance when the line of regression of y on x coincides with the line of regression of x on y ? when " y on x " coincides with the " \bar{X} -axis"?

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- (b) Explain what is meant by dispersion, skewness, ogive and deciles.
- (c) What is the "Charlier check" and how is it used?
3. In a certain city the weights of the police force are given by the following frequency distribution:—

<i>Weight in lbs.</i>	<i>Frequency</i>
140 - 154.....	24
155 - 169.....	134
170 - 184.....	210
185 - 199.....	160
200 - 214.....	12
215 - 229.....	2

Determine the mean and the median.

4. The workmen's compensation rate making formula in use during 1933 provided for the projection of medical costs two years beyond policy year 1931. By the method of least squares, determine the expected medical loss ratio for policy year 1933 on the basis of the trend during policy years 1927-1931:

<i>Policy Year</i>	<i>Loss Ratio</i>
1927	18.8%
1928	19.7
1929	20.6
1930	22.6
1931	24.4

5. What are the fundamental rules for debits and credits in double entry bookkeeping? Illustrate by explaining the journal entries for the following transactions:—
- Merchandise is purchased for cash
 - A note is taken for merchandise sold
 - A note payable is cancelled by a cash payment
 - Wages are paid
 - The firm's own note is discounted at the bank
6. (a) In June of 1933 the account of Mr. Smith, a debtor for \$200.00, was written off as a Bad Debt. In August this account of \$200.00 was paid. What entries would be made to reflect each of the above transactions?
- (b) A machine purchased on January 1, 1931 for \$10,000 has been depreciated by means of a reserve at 10 percent per

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annum on a reducing basis. The machine was sold on January 1, 1934 for \$8,000. Make the journal entry as of the latter date.

7. The trial balance of the ledger of H. Morgan is given as of December 31, 1933, as follows:—

Cash	\$1,700	
Accounts Receivable	600	
Merchandise Inventory 12/31/32.....	2,500	
Furniture and Fixtures.....	1,100	
Accounts Payable.....		\$1,000
Purchases	17,000	
Sales		22,180
Sales Returns and Allowances.....	200	
Salary	1,800	
Insurance	100	
General Expense.....	100	
Rent	600	
Notes Receivable.....	500	
Interest Receivable		20
H. Morgan: Capital		5,000
H. Morgan: Personal	2,000	
	<hr/>	
	\$28,200	\$28,200

The inventory and adjustments are as follows:

Merchandise \$3,100.; unexpired insurance \$20.; the depreciation of Furniture and Fixtures was estimated to be 10%; rent prepaid \$50.; and one Account Receivable of \$100. was estimated to be uncollectible.

Prepare a Profit and Loss Statement and a Balance Sheet.

8. (a) Explain the nature and use of the Cash Book, Purchase Book, and Sales Book for a general merchandise business.
 (b) Explain the imprest system of handling petty cash.

PART III

1. Supply the missing terms between u_4 and u_{11} having given
- $$u_1 = 5 \quad u_3 = 63 \quad u_{11} = 365$$
- $$u_2 = 29 \quad u_4 = 106$$
2. Given $u_0 = 2$, $u_1 = 0$, $u_4 = 6$, and $u_5 = 12$, find the general expression for u_x .

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3. Find the sum of n terms of the series

$$1 + 6 + 15 + 28 + \dots\dots\dots$$

4. (a) Differentiate $\frac{1}{\sqrt{a^2 - x^2}}$ with respect to x

(b) Find $\frac{dy}{dx}$ when $ax^2 + 2hxy + by^2 = 1$

5. A piece of wood is in the form of a right circular cone, of which the altitude and radius of the base are each 12 inches. What is the volume of the largest right circular cylinder that can be cut from this piece of wood, the axis of the cylinder to coincide with the axis of the cone?

6. (a) Find $\frac{d^n y}{dx^n}$ when $y = x^2 e^x$

(b) Find the value of $\int_0^{12} \frac{x dx}{(2x+3)^{\frac{3}{2}}}$

7. Integrate $\int x^n \cdot \log x \cdot dx$

8. The moment of inertia of any area is equal to the sum of the products of each elementary area of the section by the square of its distance from an assumed axis of rotation. Find the moment of inertia about the x -axis of the area bounded by the semicubical parabola $y^2 = x^3$ and the straight line $y = x$, and lying above the x -axis.

PART IV

1. A, B, and C draw numbers from 1 to 10 for a prize of \$54. to be won by the one making the highest draw. A has drawn a 6. What is now the expectation of each?
2. (a) Twelve persons are seated around a circular table. What is the probability that two designated individuals are seated next to each other?
- (b) Seven persons draw lots for the occupancy of the first six seats in a pullman car. Find the chance that two specified persons obtain opposite seats.
- (c) Find the chance that the two specified individuals in (b) above obtain adjacent seats on the same side.

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3. (a) In each of a set of games the odds in favor of the winner of the previous game are 2 to 1. What is the chance that the player who wins the first game will win three at least of the next four?
- (b) Two players of equal skill play a set of games. They stop when A requires 3 games to win and B requires 2 games to win. If the stake is \$16., what share ought each to take? No game may be tied.
4. A slot machine sells bars of candy for ten cents apiece. The machine will work if a dime is put in, or if two nickels are put in. At the end of a certain time the machine is opened and found to contain six dimes and six nickels. What is the probability that at no time were there more dimes than nickels in the machine?
5. (a) Explain a commutation table and the relation of the D , N and M columns to each other.
- (b) In how many years will the arithmetic sum of the premiums on an ordinary annual payment life policy taken out at age 25 equal or exceed the sum of the premiums on a 20 payment life policy taken at the same age for the same amount?

$$\begin{array}{l} \text{Given—} \quad N_{25} = 770113.4 \quad M_{25} = 11631.14 \\ \quad \quad \quad N_{45} = 253745.5 \quad M_{45} = 7192.809 \end{array}$$

6. (a) Find the following probabilities for two lives (x) and (y):
- (1) Both will not survive " n " years
 - (2) Either or both will survive " n " years
 - (3) Both will die in the " n "th year from the present
- Express your answer to (1) and (2) in probability symbols and to (3) in terms of the number living and/or dying at the various ages.
- (b) Find the probability that a person age 40 will live for 30 years.

$$\begin{array}{l} \text{Given—} \quad {}_5p_{40} = .95 \\ \quad \quad \quad {}_5p_{45} = .94 \\ \quad \quad \quad {}_{10}p_{50} = .83 \\ \quad \quad \quad {}_{10}p_{60} = .67 \end{array}$$

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7. (a) Determine the relationship between a_x and a_x
 (b) Express ${}_n|a_x - {}_n|a_x$ in terms of v and p_x
 (c) Express ${}_n|a_x - {}_n|a_x$ in terms of v and p_x
8. A certain compensation act provides the following death benefits:—
- (1) To the widow, 30 percent of the deceased's wages during her lifetime.
 - (2) To each child, 10 percent of the deceased's wages during the life of the widow, and 15 percent after her death; child's benefits to cease at age 18.

If the deceased's wages were \$2,000 annually, find the present value of benefits to a widow aged 25 and her child aged 6.

$$\begin{aligned} \text{Given— } {}_{12}| \bar{a}_{25} &= 11.749 \\ {}_{12}| \bar{a}_{25} &= 9.529 \\ {}_{12}| \bar{a}_{25:6} &= 9.315 \\ {}_{12}| \bar{a}_6 &= 13.806 \\ \bar{a}_6 &= 23.357 \end{aligned}$$

EXAMINATION FOR ADMISSION AS FELLOW

PART I

1. (a) Explain the application of the principle of co-insurance in a Mercantile Open Stock Burglary Policy, giving illustrations.
 - (b) Distinguish between burglary, robbery, theft and larceny as the terms are used in casualty insurance.
2. (a) What must be known regarding a single
1. Private Passenger Automobile
 2. Commercial Automobile
 3. Trailer
- in order that the manual rate applicable may be determined?

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- (b) For what kind of policy or type of car may the following underwriting bases be used for automobile liability coverage under the present manual rules?
1. Mileage Basis
 2. Earnings Basis
 3. Payroll Basis
3. (a) Outline briefly the coverage and bases of premium for the following liability lines.
1. Theatre Public Liability
 2. Teams Public Liability
 3. Employers' Liability.
- (b) Under what kind of policy is insurance against breakage of glass in automobiles obtainable? What is the maximum term of such coverage?
4. What information is necessary to calculate the premium for a policy covering
- (a) Personal Accident and Health
 - (b) Plate Glass
 - (c) Owners', Landlords' and Tenants' Public Liability.
5. Distinguish between the "pro rata" and the "short rate" bases of premium. Explain under what circumstances the respective bases are used in compensation insurance.
6. Do you consider that mortgages are a good investment for a casualty insurance company? Give reasons.
7. What limitation, if any, is placed upon the total amount which a casualty insurance company organized under the laws of the State of New York may invest in the securities of any one corporate entity?
8. Indicate which of the following classes of investments are open to casualty companies under the laws of most states,

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and which are not. Mention any special limitations on any of these classes of investments.

1. Bonds of the Dominion of Canada
2. Real Estate—title secured through foreclosure of mortgage loans
3. Collateral loans on approved securities
4. Public utilities—common stock
5. Bonds of the United Kingdom of Great Britain.

PART II

1. (a) What are the salient features common to workmen's compensation laws enacted in different states?

(b) How would vigorous enforcement of anti-compact laws affect the business of insurance?
2. Discuss from the viewpoint of both the public and the insurance carrier the desirability of state regulation of insurance companies.
3. What standard provisions in liability policies are required under the New York insurance law?
4. Discuss the advantages and disadvantages of a system of supervision by local insurance authorities as compared to centralized federal supervision.
5. Compulsory insurance against industrial accidents under the name of workmen's compensation insurance seems to be generally accepted as desirable. Discuss the desirability of compulsory health insurance for workmen.
6. Compare workmen's compensation insurance and employers' liability insurance with reference to the interests of the employee and the employer.

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7. During a period of extreme economic depression you, as a supervising authority, are requested to approve a substantial increase in workmen's compensation rates because of adverse experience. What elements would you consider in arriving at your decision? Indicate what your decision would be.
8. Name and define the various methods developed by mankind for the bearing of risk, and discuss the relationship of insurance to the other methods.

PART III

1. Discuss the advantages and disadvantages of using calendar year experience as compared with policy year experience for the determination of rates in workmen's compensation insurance.
2. (a) In what casualty lines are rates based upon loss ratios rather than on pure premiums and why?
(b) In what casualty lines do inspection pure premiums enter the rate making procedure?
3. What is the present status of schedule rating in compensation insurance? Discuss briefly the reasons for the recent fundamental changes as respects the application of the schedule rating plan.
4. Outline the chief differences between the experience rating plans currently in use for
 - (a) Automobile Liability
 - (b) Employers' Liability
 - (c) Other liability linesand give your suggestions (with reasons) for a standard plan for all liability lines.
5. Design a 45 column punch card for recording compensation indemnity and medical losses incurred as reported under the Unit Statistical Plan. In designing the card bear in mind
 - (a) That payroll and premium will be recorded on a separate punch card.

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- (b) That the loss card you design will be used in conjunction with the payroll and premium card to obtain the equivalent of Schedule "Z" by state and classification.
6. In certain states compensation benefits to a widow continue during the unmarried life of the widow. Accordingly, in order to set up proper reserves it is necessary to have information regarding death and remarriage probabilities. Outline the data which you would request the companies to furnish if you were in charge of the preparation of an American Remarriage Table.
 7. Outline briefly two alternative methods generally used in reporting statistics on three year policies. Which method would you advocate and why?
 8. (a) How would you approximate the amount of off-balance of the compensation experience rating plan in a particular state given the following data:

Payroll	\$100,000,000
Average Rate Subject to Experience Rating	\$1.00
Expense Ratio	40%
Actual Losses	\$580,000
Average Risk Credibility	65%
 - (b) Given the total compensation earned premiums for a given policy year and for a particular state, how would you approximate the "premiums at present collectible rates"?

PART IV

1. Outline the premium accounts which must be set up by a company for a casualty insurance line and the sources of the respective premium entries.
2. What principles should be used in distributing to lines of business unallocated loss expense items such as
 - (a) Adjusters' salaries in branch claim offices

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- (b) Rent of branch claim offices
- (c) Home office claim examiners' salaries
- (d) Home office claim department rent.

What information would you need to collect in order to distribute these items?

3. Name three schedules of the Annual Statement which could be classified as "asset schedules". Outline the principal provisions of each of these three schedules.
4. (a) In preparing the Annual Statement for 1933 what values were available to casualty companies for valuation of bonds and stocks?

(b) What items are ordinarily included in the Annual Statement exhibit of gain or loss in surplus from miscellaneous sources?
5. Outline briefly the Occupational Disease Program of the National Council on Compensation Insurance as applying in
 - (a) States where all Occupational Diseases come under the Act.
 - (b) States where no Occupational Diseases come under the Act.
6. Describe the two alternative forms of coverage available under a workmen's compensation and employers' liability policy for vessel, dredging and marine wrecking risks.
7. It is proposed to limit the coverage provided by Paragraph I(b) of the standard workmen's compensation policy. Discuss this suggestion.
8. Assume that a compensation law becomes effective on January 1st in a state which has hitherto not had a compensation law. Prepare a set of rules of procedure to provide continuous coverage for risks previously covered by employers' liability policies.

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JAMES S. ELSTON, Editor

The Index to the Proceedings of the first ten volumes (Numbers 1 to 22) 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 which have been written for the past several years. The contributions of every member are shown in detail and each paper has been cross-indexed by title and by the principal sub-topics. This is the first index issued by the Society and is complete as respects all of the publications of the Society since its organization, Nov. 7, 1914 to Nov. 20, 1924. The index comprises 108 pages and is bound in buckram.

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 Review of the Society's First Ten Years and a Glance Into the Future. B. D. Flynn.
 Burglary, Theft and Robbery Insurance. G. F. Michelbacher and L. H. Carr.
 The Needs and Prospects for an Educational Program in Insurance Law. Richard Fondiller.
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 On the Tendency of Labor Saving to Increase Compensation Costs. Leslie L. Hall.
 A Study of Judicial Decisions in New York Workmen's Compensation Cases. Leon S. Senior.
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- The "Permanent" Rate Making Method Adopted by the National Council on Compensation Insurance.** W. W. Greene and W. F. Roeber.
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- The Prognostic Value of Schedule Rating.** C. N. Young.
- Some Developments in Schedule Rating Since the Adoption of the Industrial Compensation Rating Schedule, 1923.** H. F. Richardson.
- Some Observations on Accident and Health Insurance.** T. F. Tarbell.
- Mathematics for Students of Casualty Actuarial Science.** James S. Elston.
- Selection and Training of Men for Casualty and Surety Field Positions.** C. G. Hallowell.
- Installment Purchase Accident and Health Insurance.** R. O. Davidson.
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- A Message to and Concerning the Casualty Actuarial Society.** Sanford B. Perkins.
- Observations on Making Rates for Excess Compensation Insurance.** Paul Dorweiler.
- Health Insurance Hazards Reflected in Occupational Health Loss Ratios.** Armand Sommer.
- Compulsory Automobile Insurance.** William J. Constable.
- State vs. Federal Compensation for Longshoremen.** Leon S. Senior.
- The Early History of the Annuity.** Edwin W. Kopf.
- Guaranteeing First Mortgage Real Estate Bonds.** William M. Greve.
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NUMBER 29

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- Presidential Address of the Fourteenth Annual Meeting of the Casualty Actuarial Society. Sanford B. Perkins.
- Method for Setting Up Reserve to Cover Incurred But Not Reported Loss Liability. Nellas C. Black.
- The Function and Place of the Statistical Department in a Multiple Line Casualty Company. Joseph Linder.
- The Position of the Reinsurance Company in the Casualty Business. Winfield W. Greene.
- Premiums and Reserves for Deferred Payment Protection. John M. Powell.
- Payroll Auditing. Donald L. Belcher.
- Has the Industrial Accident Rate Declined Since 1913? Louis A. DeBlois.
- Guaranteeing First Mortgage Real Estate Bonds. E. B. McConnell.
- 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.

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- 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.

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- 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.
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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.
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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.

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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.
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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.
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VOLUME XIX NUMBER 40

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- 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.
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VOLUME XX NUMBER 41

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- 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.

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- 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.
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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 sub-topics. 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.

CASUALTY ACTUARIAL SOCIETY

Recommendations for Study

EDUCATIONAL COMMITTEE

CLARENCE A. KULP, *Chairman*

ALBERT H. MOWBRAY

EMMA C. MAYCRINK

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WILLIAM M. CORCORAN

JOSEPH LINDER

GUSTAV F. MICHELbacher

HAROLD J. GINSBURGH

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RECOMMENDATIONS FOR STUDY

NOTE: Complete description of books cited will be found in the Index at the end of these *Recommendations*. The texts shown in large Roman type are recommended as master or principal readings; auxiliary readings are shown in smaller type under each section. For readings in periodical literature, only the name of the author, the name of the journal and the volume and page are shown. The subject of the article pertains to that of the Section under which it is shown. *Proceedings* means Proceedings of the Casualty Actuarial Society.

ASSOCIATESHIP: PART I

Section 1. Advanced Algebra.

This subject includes the matter in the ordinary college algebra, except determinants, continued fractions, and the theory and solution of equations higher than the quadratic. Special emphasis should be placed upon permutations and combinations. Thorough preparation in elementary and intermediate high school algebra and in practical business arithmetic is presupposed.

Texts:

Hall and Knight. Higher Algebra. First 16 chapters, except Chapters 6, 7, and 15.

Wilson and Warren. College Algebra. Except Chapters 7, 10, 12-16, 21.

Section 2. Compound Interest and Annuities Certain.

Texts:

Rietz, Crathorne and Rietz. Mathematics of Finance. Chapters 1 to 4.

Skinner, E. B. Mathematical Theory of Investment. Chapters 5 to 10.

Hart, W. L. Mathematics of Investment.

ASSOCIATESHIP: PART II

Section 3. Descriptive and Analytical Statistics.

This subject covers the commonly accepted elementary and intermediate methods of statistical compilation and analysis, but excludes advanced applications of mathematics to statistics.

Text:

Mills, F. C. Statistical Methods Applied to Economics and Business.

OR

Gavett, G. Irving. First Course in Statistical Method.

OR

Burgess, Robert W. Introduction to the Mathematics of Statistics.

Section 4. Elements of Accounting, including Double-entry Bookkeeping.

The candidate should have an understanding of the basic principles of double-entry bookkeeping and their application to the following: theory of debit and credit and its application to the presentation of simple accounting facts; the uses and relations of the basic accounting books, ledger, journal, cash-book and voucher register, with simple columnar development; the technique of periodic adjustments affecting accruals, use of subsidiary ledgers and of controlling accounts; meaning and relation of the balance sheet, loss and gain account and the technique of their preparation as applied to simple problems. The candidate will be expected to be familiar only with principles of accounting, applicable chiefly to mercantile and manufacturing business (inventory, manufacturing and cost accounts, partnership, consignments, discounts, valuation of assets and good will and issuance of capital stock, and corporate organization).

Text:

Kester, R. B. Accounting Theory and Practice. Volume I, Chapters 1 to 30.

ASSOCIATESHIP: PART III

Section 5. Finite Differences.

Text:

Freeman, H. An Elementary Treatise on Actuarial Mathematics. Chapters 2 to 8.

Auxiliary Text:

Boole, C. Treatise on the Calculus of Finite Differences.

Section 6. Differential and Integral Calculus.

Texts:

Freeman, H. An Elementary Treatise on Actuarial Mathematics. Chapters 9 to 17.

Granville, Smith, Longley. Elements of the Differential and Integral Calculus. Chapters 1-7, 11 (except sections 114 and 115), 12, 14, 15 (to end of section 164), 16, 19, 20.

ASSOCIATESHIP: PART IV

Section 7. Probabilities.

Texts:

Hall and Knight. Higher Algebra. Chapter 32 (except geometrical methods).

Freeman, H. An Elementary Treatise on Actuarial Mathematics. Chapter 18.

Auxiliary Text:

Whitworth, W. A. Choice and Chance.

Section 8. Elements of the Theory of Life Contingencies; Life Annuities; Life Assurances.

Text:

Dowling, L. Wayland. Mathematics of Life Insurance. Chapters 1-6 and 9.

Auxiliary Texts:

Moir, H. Life Assurance Primer. Chapters 1-8 and 10.

Forsyth, C. H. Mathematical Theory of Life Insurance.

NOTE: The candidate is urged to pay particular attention to the mathematics of life annuities.

FELLOWSHIP: PART I

Section 9. Policy Forms and Underwriting Practice in Casualty Insurance.

The candidate should be generally familiar with the policy forms and rate manuals in use in the several divisions of casualty insurance. Analysis of the policy contract and the study of the descriptive matter and rate tables of the manuals should give the candidate a sound understanding of the chief characteristics of the various lines of insurance:

The Insuring Clauses of the Contract: (a) subject matter of the insurance; (b) the contingency insured against; (c) service in investigations and settlements; (d) defense of suits; (e) payment of expenses; (f) exceptions as to coverage; (g) period of insurance; (h) conditions relieving insurer of liability.

The Premium: (a) unit on which computed; (b) when payable; (c) methods of adjustment when policy is cancelled by insurer or assured.

General Provisions: (a) inspection of premises or subject of the insurance by the insurer; (b) inspection of the assured's books; (c) notice of loss; (d) subrogation.

Texts and References:

Kulp, C. A. Casualty Insurance.

Lunt, E. C. Surety Bonds.

Michelbacher, G. F. and Nial, T. M. Workmen's Compensation Insurance.

Michelbacher, G. F. and Associates. Casualty Insurance Principles.

Kopf, E. W. *Proceedings*, XVI, 22

Section 10. Investments of Insurance Companies.

Preparation is presupposed in (a) the principles of economics, (b) the principles of investment, with especial reference to the principles and practices of investing capital, surplus and reserve funds of casualty insurance companies, and (c) the broad outlines of the law of real property. The following general readings are suggested as preliminary to the principal texts:

Fundamental Texts:

Taussig, F. W. Principles of Economics.

Badger, R. E. Investment Principles and Practices.

Chamberlain, L. and Edward, G. W. Principles of Bond Investment.

Benson, P. A. and North, N. L. Real Estate: Principles and Practices.

Bishop, A. L. The Financing of Business Enterprises.

Corpus Juris, Vol. 50. Sections 1-4; 19-31; 43; 46; 48-55.

Texts:

Rose, D. C. Scientific Approach to Investment Management.
2 vols.

Moulton, H. G. Financial Organization of Society.

Sun Life Assurance Company (Montreal). The President's Book. Chap. 10.

Auxiliary References:

Papers on these subjects for the three years preceding examination in the publications of the following associations and societies:

Association of Life Insurance Presidents (*Proceedings*)

Actuarial Society of America (*Transactions*)

American Institute of Actuaries (*Record*)

National Convention of Insurance Commissioners (*Proceedings*)

FELLOWSHIP: PART II

Section 11. Insurance Law and Legislation.

1. *Introduction to the Law; Business Law.*

Texts:

Stone, H. F. Law and its Administration.

Conyngton, T. H. Business Law.

2. *Principles of the Law of Insurance.*

Text:

Patterson, E. W. Essentials of Insurance Law. Chapters 2, 3, 5-12.

Corpus Juris. Vol. 32: Insurance. Sections 1-125, 175-354, 362-413, 423-424, 482-647.

Also the following sections in other Volumes:

Accident Insurance. Vol. 1, 397.

Automobile Insurance. Vol. 6, 867.

Burglary, Theft and Robbery Insurance. Vol 9, 1095.

Casualty Insurance. Vol. 11, 30.

Credit Insurance. Vol. 15, 1354.

Fidelity Insurance. Vol. 25, 1088.

Health Insurance. Vol. 29, 278.

Indemnity. Vol. 31, 417.

Liability Insurance. Vol. 36, 1053.

Livestock Insurance. Vol. 38, 99.

Lloyds. Vol. 38, 114.

Plate Glass Insurance. Vol. 48, 1225.

Steam Boiler Insurance. Vol. 8, 1140.

Title Insurance. Vol. 62, 1051.

OR

Couch, George J. Cyclopedia of Insurance Law.

Vol. 1. Chapters 1; 2; Sections 84-95, 97-103, 134, 166-167, 169-189, 219-233, 241-249, 292-304.

Vol. 2. Sections 486-555.

Vol. 3. Sections 556-573, 579-586, 703-741.

Vol. 4. Sections 817-823.

Vol. 5. Sections 1038-1065, 1164-1165b, 1173-1179, 1182, 1184, 1191, 1199, 1212, 1219, 1223.

Vol. 6. Chapter 17 (Parts I and II); 23; 24; 26.

Vol. 7. Chapters 28; 29; 31; 33 (Part I); 34.

Vol. 8. Chapters 36; 37; 39; 40; 41; 46.

3. *Current Legal Decisions.*

References:

Department of Labor, New York State (Albany). Workmen's Compensation Law and Industrial Board Rules. Latest edition.

Association of Casualty and Surety Executives, 1 Park Avenue, New York City. Digest of Workmen's Compensation Laws. Latest edition.

Proceedings of the Casualty Actuarial Society and Transactions of the Actuarial Society of America. Legal Notes. Issues for the three years preceding examination. In the *Transactions* refer only to cases on double indemnity, total disability and accident and health.

4. *Statutes Governing Insurance Companies.*

References:

Patterson, E. W. Essentials of Insurance Law. Chapter 1.

Baldwin, W. E. New York Insurance Law, 1933.

Article I: Sections 1-69.

Article II: Sections 70-109.

Article V-a: Sections 185-197.

Article X-b: Sections 340-350.

New York Workmen's Compensation Law, p. 290 et seq.

Tarbell, T. F. Proceedings. XII, 29.

5. *Supervision, Regulation and Taxation of Insurance.*

Text and References:

Patterson, E. W. Insurance Commissioner in the United States.

Hobbs, C. W. Proceedings, XI, 218.

Magrath, J. J. Proceedings, XX, 281.

Section 12. Insurance Economics.

1. *Theory of Risk.*

Texts:

Willett, A. H. Economic Theory of Risk and Insurance. Chapters 1, 7.

Hardy, C. O. Risk and Risk-Bearing.

2. *Social Insurance.*

Texts and References:

Armstrong, Barbara N. Insuring the Essentials. (Except the sections on minimum wage.)

- Williams, Pierce.* Purchase of Medical Care Through Fixed Periodic Payment.
- Stewart, Bryce.* Unemployment Benefits in the United States.
- Committee to Study Compensation for Automobile Accidents.* Report.
- International Labour Office.* Studies and Reports. Series M. Social Insurance.
- United States Bureau of Labor Statistics.* Washington. *Monthly Labor Review.* For recent developments see issues for three years preceding examination.
- International Congress of Actuaries. Bulletin of Permanent Committee.* Issues for three years preceding examination for foreign developments.
- Rubinow, I. M.* The Quest for Security.

FELLOWSHIP: PART III.

Section 13. Calculation of Premiums and Reserves for Casualty (including Social) Insurance.

1. *Manual Rates, Workmen's Compensation.*

The candidate should be familiar with: (1) the National Council on Compensation Insurance rate-making method, (2) the New York and Massachusetts modifications, and (3) the Pennsylvania method (Write Pennsylvania Compensation Inspection and Rating Bureau, Ledger Building, Philadelphia).

Text and References:

Greene, W. W. and Roeber, W. F. Proceedings. XII, 253.

Roeber, W. F. Proceedings. XV, 223.

Smith, C. G. Proceedings. XV, 181.

Perryman, F. S. Proceedings. XX, 45.

Kulp, C. A. Casualty Insurance. Chapter 13.

Hobbs, C. W. Annual Report to the National Convention of Insurance Commissioners. 1930 to date.

In addition the candidate should also familiarize himself generally with all other papers on this subject in the *Proceedings* to date. The following will be of particular importance:

<i>Volume</i>	<i>Page</i>	<i>Author</i>
I	24	Mowbray
III	195	Michelbacher
VIII	77	Mowbray
IX	208	Mowbray
XII	268	Dorweiler
XIII	154	Dorweiler
XIV	262	Haugh
XIX	230	Greene
XX	27	Senior

2. *Merit Rates, Workmen's Compensation.*

The candidate should secure copies of the experience rating plans and forms of the National Council and of the Pennsylvania Compensation Inspection and Rating Bureau (Ledger Building, Philadelphia). Because of its present status, references to schedule rating are to historical sources only.

Texts and References:

Whitney, A. W. Proceedings. IV, 274.

Perkins, S. B. and Wheeler, R. A. Proceedings. IX, 11.

Whitney, A. W. and Outwater, O. Proceedings. X, 148.

Richardson, H. F. Proceedings. XIII, 29.

Young, C. N. Proceedings. XIII, 114.

Kormes, M. Proceedings. XX, 68.

Hobbs, C. W. Experience Rating in Compensation Insurance. Proceedings of the National Convention of Insurance Commissioners, 1924. Pp. 272-282.

Michelbacher, G. F. and Associates. Casualty Insurance Principles. Chapters 7, 8.

Kulp, C. A. Casualty Insurance. Chapter 14.

In addition it is expected that the candidate will make himself generally familiar with all other papers on the subject of merit rating in the *Proceedings* to date of the examination. Those in Volume I are of particular importance historically.

3. *Loss Reserves, Workmen's Compensation Insurance.*

The standard liability and compensation loss reserve law is contained in Section 86 of the Insurance Law of New York. The convention form of annual statement blank for casualty companies sets forth in Schedule P the statutory loss reserve requirements. This schedule should be studied carefully.

Text and References:

Matthews, A. N. Proceedings. XIV, 244.

Davies, E. A. Proceedings. XV, 28.
Comstock, W. P. Proceedings. XVII, 42.
Roeber, W. F. and Marshall, R. M. Proceedings. XIX, 279.
Michelbacher and Associates. Casualty Insurance Principles.
Chapter 9.

4. *Premiums and Reserves, Other Casualty Lines*

Accident and Health Insurance.

References:

King, W. I. Proceedings. II, 49.
Sommer, A. Proceedings. XIII, 181.
Tarbell, T. F. Proceedings. XIII, 47.
Craig, J. D. Proceedings. XVII, 51.
LaMont, S. M. Proceedings, XVIII, 9.

Automobile Insurance.

References:

Stellwagen, H. P. Proceedings. XI, 276.
Constable, W. J. Proceedings. XIII, 188; XV, 171.
Barber, H. T. Proceedings. XV, 191.
Wheeler, R. A. Proceedings. XVI, 268.
Perryman, F. S. Proceedings. XIX, 65.

General.

References:

Black, N. C. Proceedings. XIV, 9.
Tarbell, T. F. Proceedings. XIX, 1.
Dorweiler, Paul. Proceedings. XX, 1.
New York Insurance Report. 1932. Vol. III, 414-550. Report of Examination of National Bureau of Casualty and Surety Underwriters.

5. *Pensions and Social Insurances.*

Pensions.

Texts and References:

Buck, G. B. Proceedings. II, 370.
Woodward, J. H. Proceedings. VIII, 13.
Cogswell, E. S. Proceedings. XII, 97.
Robbins, R. B. Proceedings. XII, 238.

Edwards, H. H. and Murrell, R. Staff Pension Schemes in Theory and Practice.

Latimer, Murray W. Industrial Pension Systems. Chapter 19.

Social Insurance.

References:

Kulp, C. A. Proceedings. XIX, 268.

Ohio Commission on Unemployment Insurance. Report. Part I.

Section 14. Advanced Practical Problems in Casualty (including Social) Insurance Statistics.

This subject includes: (a) the planning and use of statistical manuals and systems, for the compilation and presentation of casualty insurance statistics, for rate making and administrative purposes; (b) the chief characteristics, sources and uses, of external statistics auxiliary to rate making and administrative procedures in casualty (and social) insurance.

Internal Statistics.

Study of the statistical plans in use in connection with the several casualty lines is essential. The "Workmen's Compensation Statistical Plan" and "Instructions for Filing Schedule Z" may be obtained from the National Council on Compensation Insurance, 45 East 17th Street, New York City. Statistical plans for casualty lines are published by the National Bureau of Casualty and Surety Underwriters, 1 Park Avenue, New York City. The personal accident and health statistical plan (including non-cancellable accident and health) may be obtained from the Bureau of Personal Accident and Health Underwriters, same address. A copy of the report on combined health experience on commercial policies may be secured from the same organization.

Text and References:

Michelbacher, G. F. and Associates. Casualty Insurance Principles. Chapter 10.

Linder, J. Proceedings. XIV, 27.

Hull, R. S. Proceedings. XVII, 179.

Graham, C. M. Proceedings. XVII, 190.

Kormes, M. Proceedings. XVIII, 99.

Compensation Insurance Rating Board, New York. Statistical Plan for Unit Reporting (Schedule Z) in New York State.

Best's Insurance Reports. Casualty, Surety and Miscellaneous. Latest edition. Particularly the materials in the Preface and Comparative Tables.

Best's Reproductions of Principal Schedules from Casualty and Surety Statements. Latest edition.

Department of Labor and Industry, Commonwealth of Pennsylvania. Special Bulletin No. 40, Parts I, II.

External Statistics.

Statistical methods and sources for use in rate-making and administrative guidance in casualty (and social) insurance.

Texts and References:

United States Bureau of Labor Statistics. Methods of Procuring and Computing Statistical Information. Bulletin 326.

United States Department of Commerce. Commerce Yearbook; Survey of Current Business (Monthly).

Federal Reserve Board. Washington. Federal Reserve Bulletin (Monthly).

Newsholme, Arthur. Elements of Vital Statistics.

Schmeckebier, L. F. Statistical Work of the United States Government.

Kopf, E. W. *Proceedings.* XI, 102.

Stewart, Bryce. Unemployment Benefits in the United States. Chapter 2.

The student should also read regularly one of the following monthly publications:

New York Industrial Commission. Albany. Industrial Bulletin.

Pennsylvania Department of Labor and Industry. Harrisburg. Labor and Industry.

Wisconsin Industrial Commission. Madison. Wisconsin Labor Market.

FELLOWSHIP: PART IV.

Section 15. Advanced Problems and Practical Methods of Casualty Insurance Accounting.

This subject includes the treatment of advanced practical problems of modern insurance operating accounts. The purpose and the technique of the preparation of the annual statement, with accompanying schedules, including schedule W and the New York Casualty Experience Exhibit, should be thoroughly understood. A comparative study of the annual statements and schedules of a few companies, as given in the two latest editions of Best's Repro-

ductions of Principal Schedules from Casualty and Surety Statements, will be of material assistance.

Text and References:

Hull, R. S. Casualty Insurance Accounting.

Hull, R. S. Proceedings. IX, 38.

Craig, J. D. Proceedings. X, 9.

Tarbell, T. F. Proceedings. X, 107; XII, 215; XV, 141; XVI, 131.

Bailey, W. B. Proceedings. XIV, 233.

Haugh, C. J. Proceedings. XIV, 262.

Van Tuyl, H. O. Proceedings. X, 17; XVI, 121.

Masterson, N. E. Proceedings. XVI, 288.

The accounting provisions of the liability and compensation loss reserve laws in force in New York, Massachusetts, Illinois and other States should be carefully examined. The candidate should endeavor to develop from practical discussion and close observation, critical reading and original thinking, a facility for the solution of the accounting problems which come to the supervising actuary of a casualty and miscellaneous line office.

Section 16. Advanced Problems in Underwriting, Administrative and Service Elements of Casualty (including Social) Insurance.

Technical proficiency in these subjects can be developed only by direct discussion with competent executives, underwriters, engineers and adjusters, and through study of professional papers read before organizations of supervisory and administrative officials. It is strongly recommended that the candidate seek his information through these means. Insurance journals, proceedings of conferences and conventions, technical papers in journals featuring the insurance sciences afford sidelights on major problems of the casualty insurance business, on its administration, history and relation to the public interest. The systematic reading of at least 2 insurance journals (*Eastern Underwriter, Weekly Underwriter, National Underwriter*) will keep the candidate in touch with current developments. Foreign experience and practice should not be neglected.

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Insuring the essentials. New York. Macmillan. 1932, 717 p. \$5.00.
- Badger, Ralph E.
Investment principles and practices. New York. Prentice-Hall. 1928, 915 p. \$6.00.
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New York insurance law, containing all amendments, with an appendix containing miscellaneous laws affecting insurance. New York. Banks Law Publishing Co. 1933, 508 p. \$6.00.
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Real estate; principles and practices. New York. Prentice-Hall. 1927, 342 p. \$5.00.
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Best's insurance reports. Casualty, Surety and Miscellaneous. New York. Latest edition. \$15.00.
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Best's reproduction of principal schedules from casualty and surety statements. Latest edition. \$20.00.
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Treatise on the calculus of finite differences. 3d edit. New York. Stechert. 1926, 336 p. \$4.00.
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- Committee to Study Compensation for Automobile Accidents. Report. Published by the Committee. Commercial Trust Building, Philadelphia. 1932, 300 p. \$1.00.
- Conyngton, Thomas
Business law. 3d ed. rev. New York. Ronald Press. 1932, 702 p. \$6.00.
- Corpus Juris
American Law Book Company. New York.
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Cyclopedia of insurance law. 8 vol. Rochester. Lawyers' Cooperative Publishing Co. 1929. \$75.00, set.
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Staff pension schemes in theory and practice. London. C. & E. Layton. 1927, 135 p. 7s. 6d.
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Nature of capital and income. New York. Macmillan. 1923, 427 p. \$3.75.

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Introduction to the mathematical analysis of statistics. New York. John Wiley & Sons. 1924, 241 p. \$2.25.
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- Gavett, George Irving
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- Granville, W. A., P. P. Smith, and W. R. Longley
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- Hardy, Charles O.
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- Hull, Robert S.
Casualty insurance accounting. New York. Ronald Press. 1930, 325 p. \$10.00.
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Series N (Statistics) and Series M (Social Insurance). London. P. S. King & Son, or Inter. Labour Office. Washington, D. C. \$.50 a copy.
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