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NOTICE

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

"For to whatever point the perfecting of anything absolutely leads us, improvement is always an approach toward that point."

Epictetus

Vol. XXXIV No. 64

PROCEEDINGS

NOVEMBER 14, 1947

THERE IS NEED FOR UNDERSTANDING

PRESIDENTIAL ADDRESS BY CHARLES J. HAUGH

The tribulations which afflict casualty insurance are as imposing and as endless as the trials which confronted Hercules. And he had the advantage of meeting his tasks one at a time. It is not my intent to embark upon a harrowing recital of the current difficulties with which the business is tormented. A mere recounting of our woes can be of no value here unless such a recording now, be cited later to demonstrate that the passage of time alone can be of great help in the solution of some apparently overwhelming problems. Unfortunately many of our difficulties cannot be resolved so pleasantly. At least not resolved satisfactorily. This is especially true of the one I should like to discuss.

The phrase "social insurance" is an ill-defined term which, in the minds of all too many, connotes government insurance. The connotation is not unfounded. The enactment of workmen's compensation legislation in this country was accompanied by demands for government-operated monopolistic insurance organizations - demands which resulted in such monopolies in seven states, which brought into existence government-operated insurance organizations on a competitive basis in eleven states, and which are reiterated, albeit unsuccessfully, with the persistence of spawning salmon. The program of old age and survivorship benefits was inaugurated as a federal monopoly. The program of unemployment benefits was instituted as a series of state monopolies operating with federal financial assistance. There still remains to be established those portions of the over-all social security program which will provide for non-occupational disability and for medical benefits, including surgical benefits and hospitalization. That portion of the program having to do with non-occupational disability is currently before us and it is to that program and the insurance problems in connection with it that I would direct your attention.

Much has already been accomplished in the field of non-occupational disability. Large numbers of employees are already insured under group accident and health policies, individual accident and health policies, employee mutual sick benefit associations, trade union plans, et cetera. The fact remains, however, that there are still large numbers of employees not so insured.

In recent years there have been introduced a number of legislative bills designed to provide a non-occupational disability benefit. Legislation of this kind was stimulated by the action of Congress amending the Social Security Act so as to make available to the individual states for the payment of non-occupational disability benefits the contributions of employees which had been paid into the Unemployment Fund. There were nine states affected by this legislation and some very substantial amounts of money became available under it. When Congress enacted this amendment, I believe over three hundred million dollars became available under this provision in California and approximately twenty-eight million dollars in Rhode Island.

Up to the present time there have been two states which have enacted legislation providing for non-occupational disability benefits. Since 1943 the State of Rhode Island has been paying a non-occupational disability benefit to employees subject to its Cash Sickness Compensation Act. This operates as a monopolistic state fund. More recently, the State of California enacted a law which provides for a state fund, but which contains provision that under certain conditions and subject to regulations prescribed by the State Fund, an employer may elect his own insurance carrier or may self-insure. While this might be looked upon as analogous to a competitive state fund as we know them in workmen's compensation insurance, the analogy is far from complete, for under the California statute the private carriers are actually subject to regulation by the State Fund.

The State of New Jersey appointed a commission to investigate this subject. In April of 1946 that commission proposed legislation on what has been termed the "New Jersey Plan". Under that plan, employers of the State would be required to provide non-occupational disability benefits for their employees. Claims would be adjudicated in a manner similar to that in effect in workmen's compensation insurance. The legislation would authorize a deduction from the wages of employees subject to a prescribed maximum and the employer would be required to pay any additional cost. For the completion of the record, it should be noted here that following the Congressional action previously referred to of making available certain funds accumulated to meet future unemployment benefits, the New Jersey Commission reversed its original stand and proposed in its stead a program similar to California. A plan such as that originally proposed by the New Jersey Commission accomplishes all of the legitimate objectives which are sought for disability benefits; permits the continuation of the many disability benefit plans which are already in effect and which, in many instances, afford greater benefits than those contemplated by the legislation; and accomplishes this without any requirements that the state go into the insurance business.

The enactment of such a plan, however, poses some difficult problems for insurance companies, such as:

(a) Some of the largest writers of group accident and health insurance lack the facilities required to service small risks. This is particularly true of life insurance companies. On the other hand, workmen's compensation carriers are well equipped to handle either large or small risks. It must be apparent that the handling of small risks presents problems quite different from those arising in connection with the insurance of large risks involving large numbers of employees. There is involved not merely the question of the expense of handling small risks, but also the possibility of adverse selection which may have a much more substantial effect upon the desirability of the individual small risk.

(b) The enactment of a mandatory law of this type necessitates the establishment of a means of affording insurance to risks unable to secure it for themselves. In the fields of workmen's compensation insurance and automobile liability insurance this problem has been met through the medium of assigned risk plans. Undoubtedly there are companies to whom such a plan would be a most unwelcome innovation. The alternative appears to be a pool, and that probably would be greeted even less effusively by an even greater number of companies. There is no doubt but that those companies who lack the facilities to handle small risks would have a real problem under an assigned risk plan. There are séveral alternatives which might be considered by such companies in lieu of each establishing requisite facilities to handle such risks. They might, among themselves, establish an organization to take care of such risks either on a service basis or through a voluntary pool, or each such company might arrange for some company with requisite facilities to service the risk for it or even to take its assigned risks on a basis whereby the company to whom the risk was originally assigned would reinsure the servicing company guaranteeing it against loss.

(c) The type of legislation proposed under the New Jersey Plan is not legislation which can be sponsored by insurance companies. If they were to do so, they would promptly be accused of selfish motives, that is, of requiring employers to purchase such insurance which previously had been on a voluntary basis. Any such proposal must come for employers.

(d) Among some companies there appears to be a fear that legislation of this type would incorporate rate regulatory legislation. Rate regulatory legislation for this type of coverage might come about although it is not at all necessary to the operation of the program. We have not had rate regulatory legislation in the field of group accident and health insurance and certainly the forces of competition have operated successfully to preclude any restrictions on competition. It may be contended that lack of any rate regulatory legislation might result in an individual carrier establishing unconscionable rates for less desirable classes of risks. That would be possible, but it may well be expected that fear of the enactment of rate regulatory legislation would prevent such a course of action on the part of an individual carrier.

(e) Doubt has been expressed as to the constitutionality of legislation along the lines of the New Jersey Plan, but I understand the preponderance of opinion at the moment to be that such legislation probably would be upheld.

I shall not attempt to discuss the details of legislation of this type, nor all of the many features of such legislation which would create problems for the industry. Those enumerated appear to constitute the principal stumbling blocks to general acceptance of the principle by insurance companies. They are real difficulties, but they are not insuperable and I cannot believe that casualty, life and accident and health insurance companies are unable to get together on the solution of all of them.

A number of casualty companies appear to have little realization of the importance of this problem to them. Many companies have looked upon this entire problem as one affecting group accident and health insurance which they do not write and conclude that the problem is of no direct concern to them. The principles involved are of primary concern to every insurance company. The problems under consideration are of immediate concern to every company which writes workmen's compensation insurance or group accident and health insurance. I cannot urge too strongly that every company acquaint itself fully with the problem and all that is at issue.

For years casualty insurance companies have fought the battle of private enterprise versus government in business. That battle is unceasing as every company writing workmen's compensation insurance knows. It must be borne in mind that there is a substantial group which would like to see a federal monopolistic fund in the field of non-occupational disability in addition to those groups who are horrified at the thought of a federal monopoly, but who believe a state monopolistic fund to be quite acceptable. In the field of workmen's compensation insurance, competitive state funds generally have; and jealously guard, statutory advantages, but these are as nothing compared to the idea which prevails at the moment with respect to a competitive state fund in the field of non-occupational disability. In that field the current thought appears to be not that there would be created a competitive state fund, but that the statute would permit private enterprise to exist subject to regulation by the state fund and only so long as such competition is not inimical to the interests of the state fund. The use of the word "competitive" in describing such a system is somewhat ironical!

At the present time the insurance industry is not united. There are differences of opinion among the several classes of carrier, and even within the different classes of carrier there seem to be divergent views. These divergences appear to arise in part from a lack of understanding of the problem; in part from a naive faith that a competitive state fund will be content to exist as the receptacle for undersirable business; and in part from a state of stolid indifference. If all classes of carrier, accident and health, casualty and life, will make the effort to become fully acquainted with the California, New Jersey and Rhode Island Plans and the probable effects of those plans upon insurance; and will study the history of state funds in the United States and Canada, especially in the field of workmen's compensation insurance, many of the current differences of opinion will disappear and such stolid indifference as many exist today will be replaced by zealous concern.

At a time when casualty companies are surfeited with business, it may appeal to you as inappropriate that I urge consideration of a program of embarking upon a venture which might ultimately develop an additional premium volume equivalent to that of workmen's compensation insurance. Admittedly, this is not the psychological moment to sponsor such a project. However, we are not in a position to choose the time for acting. That has been done for us. I have no panacea to offer. I have not even any thoughts on the subject that have not been enunciated previously better than I can do. My only purpose in bringing this before you is to urge that every company in the business give some real thought to the problem. It would be of tremendous assistance to the insurance industry in arriving at an unanimous conclusion if all of us would reexamine our phobias and forget for a moment to be implacable. Lest some of the casualty companies still be inclined to be skeptical of the direct effect upon them, may I mention in conclusion that the old saw applicable to Maine elections might well be paraphrased to read, "As non-occupational disability goes, so goes workmen's compensation".

INTERSTATE AND OVERALL RATING PLANS

BY

SEYMOUR E. SMITH

The National Council on Compensation Insurance has recently adopted two rather extensive modifications to the existing rating plans for workmen's compensation insurance. The first is the extension of the experience rating plan from an intra-state to an interstate basis. The second provides for the optional combination for retrospective rating purposes of workmen's compensation and other third party liability lines. This extension of the retrospective rating plan further provides that the rating values are not fixed in tabular form as in the current retrospective procedure, but may be selected by the assured and the carrier in accordance with the rules established for the plan. It is the intent of this paper to outline the reasons for these modifications and the procedures that will be involved in their application.

Interstate experience rating is nothing new in the field of workmen's compensation insurance, having been in use in an appreciable number of states prior to its discontinuance in July of 1932. At that time the principle of interstate rating was still advocated by the majority of the carriers, but there were several practical difficulties which appreciably reduced the effectiveness of its application and made such discontinuance advisable. The first difficulty was the limited number of jurisdictions to which the plan applied. Several of the large industrial states would not permit interstate rating, and insisted upon their own individual intra-state plans. This not only reduced the number of risks which were eligible for interstate rating but also drastically curtailed the effectiveness of the plan for many risks which did qualify. A second difficulty was the highly complicated procedure involved. An average modification for the risk was first calculated using the combined experience for all states. 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 calculated and then multiplied by an "F" factor. This "F" factor was 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. This was a complicated and laborious procedure at best, and under the statistical procedures in effect at that time the plan involved a burden and expense upon the business that did not seem to be justified by the results obtained. In addition, the overall need for an interstate experience rating plan was materially lessened by the fact that in 1932 there were thirteen states in which workmen's compensation rates were not subject to regulation. If the intra-state rating procedure did not develop proper results for a risk with multi state operations the premium in the unregulated states could be adjusted to produce the required overall results. This was, of course, not the most desirable method, but it did serve a highly practical purpose in developing satisfactory rates for interstate risks. Thus, although interstate rating was abandoned as a formalized rating plan, it was still carried on informally for a large proportion of interstate risks.

The theory of experience rating is that the degree to which a risk is better or worse than the average of all risks of the same class shall be measured by the experience of the past. The actual losses for the experience period are compared with the losses contemplated by the manual, or average, rates. The difference between the actual and expected losses is tempered by the amount of credence that can be given to the actual experience, and as the risk increases in size a greater amount of reliability can be placed upon its own losses. If an interstate risk is broken up into segments and the operations in each state are rated separately the resulting decrease in credibility may very well result in modified rates which will produce an over-all premium for the risk which is palpably too high or too low. There is the additional problem, quite frequent among contracting risks, of the assured who expands his operations to an additional state. Under an intra-state plan this risk must be written at manual rates in the new state regardless of how good or how bad his experience record has been for similar operations in other states. Since within a very short time rate regulation will be in effect for almost all casualty lines in all but a very few states, it will no longer be possible to arrive at a proper over-all rate for the individual risk by adjusting the rates for those jurisdictions or lines of insurance which are not subject to supervision. The National Council on Compensation Insurance recognized that this change in the rate regulatory picture plus the new legal concept of insurance as interstate commerce presented a very real and practical problem in developing proper rates for interstate risks which would only be solved satisfactorily by the adoption of an interstate experience rating program.

There have been two developments during the intervening years since the old interstate experience rating plan was discontinued which will make for a far less cumbersome and complicated procedure. The first is the Unit Statistical Plan which was adopted by the National Council in 1934 and which is now in use in practically every state. This plan for the compilation of basic statistics furnishes the individual experience record of every risk in the state, thus eliminating the need for the separate experience rating reports required by the procedure in effect in 1932. The second development is the multi-split experience rating procedure which was introduced in 1940 and which is now in effect in all except a very few states whose independent rating bureaus are renowned for their rugged individualism. The multi-split plan is much more simple in operation than the old experience rating plan and is readily adaptable to combination between states.

The new interstate experience rating plan was filed to become effective October 1, 1947, and at the time of this writing is now effective in 21 states, and pending in all but a few states. For those states in which it is in effect the plan provides that any risk which qualified for experience rating in any one state on an intra-state basis shall be eligible for interstate rating and shall be rated upon the experience of all states combined for which the plan has been approved. The initial step in the rating procedure is the filing by the carrier of the Notification of Coverage form, which lists each state in which the risk operates and the risk name and policy number for each state. This form is necessary since the present Unit Reports for the individual states do not show whether or not the risk operates in other jurisdictions. The information required for this Notification of Coverage form is readily available to the carrier from its payroll audit records. When the National Council received the list of states from the carrier the Unit Report cards are drawn for the risk and the actual and expected primary and excess losses for each state are entered on the present experience rating form. The rating forms for each state are placed together and the totals for each state are posted on the Summary Sheet for Interstate Risks shown as Exhibit A attached. This summary sheet is the form on which the interstate experience modification is calculated. The rating formula is the same as that in the intra-state multi-split plan as follows:

$$M = \frac{Ap + B + WAe}{Ep + B + WEe}$$

The actual and expected primary and excess losses are the totals for all states combined. The "B" value is the weighted average of the "B" values for each state based upon the total expected losses for all states combined. The "W" factor is similarly the weighted average of the "W" factors for each state based upon the total expected losses for all states combined. The weights used are the expected losses for each state.

The experience modification determined by the above procedure applies in all states in which interstate experience rating is effective, thus eliminating the cumbersome procedure under the old interstate plan under which the modification was adjusted for each state developing a qualifying volume of experience. The use of a single modification for all states follows the concept of considering the risk in its entirety. Under the intra-state plan if a risk's operations are carried on at several different locations within the state the risk is rated as a whole and no attempt is made to develop a separate modification for each individual location. Under an interstate procedure the same treatment was considered to be the most desirable, since no practical advantages accrue from measuring the experience as segregated by state boundaries. If the distribution of the risk's operations by state is relatively static the development of a separate modification for each state under an interstate plan will have no effect upon the over-all premium for the risk, and an unnecessary amount of labor and expense will be incurred. If the distribution of operations by state is subject to appreciable fluctuation the use of separate modifications by state may produce very undesirable results. Individual state modifications would have to be adjusted to produce the over-all interstate modification for the risk and the adjustment factor might be very substantial for a risk with operations spread out over many states. If operations were greatly expanded in a state where a small volume of experience had produced abnormally favorable or unfavorable results, the effect of a substantial adjustment factor could produce rates that would be unreasonably low or high for the risk.

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Before going into the actual procedures involved it seems desirable to outline the reasons why the National Council on Compensation Insurance has adopted the extension of the retrospective rating procedure to provide for the optional combination for rating purposes on an interstate basis of workmen's compensation with other third party liability lines, and also why the procedure was further extended to provide that the retrospective rating values should not be established in tabular form but may be selected by the assured and the carrier in accordance with the rules established. As in the case of interstate experience rating, the recent changes in the casualty rate regulatory picture have raised a very practical problem in the rating of large risks. Ever since the introduction of retrospective rating in 1936 this type of plan has been applied to a steadily increasing number of risks. During the early years of the plan many carriers experimented with writing all third party liability lines including compensation under a single over-all retrospective plan. Since automobile and other liability rates were unregulated in most states, the premium for these lines was an amount which when added to the approved compensation premium produced the premium developed by the over-all retrospective agreement. It was found that this type of plan was exceedingly successful in its operation, and it became increasingly popular with both carriers and assureds as it demonstrated its ability to produce a final premium which came far closer towards meeting the actual needs of the individual risk than any casualty rating plan that had yet been developed. This type of plan was given a further impetus by The Comprehensive Rating Plan for National Defense Projects which was developed by the United States

Government just prior to our entry into the war. This was a retrospective plan which combined workmen's compensation and other third party liability lines for rating purposes. The reason for the successful operation of this type of plan is that it brings the advantages of multiple line underwriting down to the individual risk level. Although each line of insurance must receive separate consideration in all of its various aspects both the insurance buyer and the underwriter are primarily concerned with whether or not the total premium for all third party liability lines properly reflects the over-all experience and hazards of the risk. No matter how carefully rates and rating plans are developed for any one line of casualty insurance the resulting rates will be too high for some risks and too low for others. When several lines are combined in rating the individual risk the chance for their over-all accuracy is greatly enhanced, since any inequity developed in any one line will tend to be offset in another line.

At the present time over-all retrospective rating has passed beyond the experimental stage and has become an integral part in the rating of large casualty risks throughout the country. Since rate regulation will soon become effective for all third party liability lines in almost every state it became necessary to develop a formal over-all retrospective plan within the framework of legislative enactment to avoid a serious disruption of the casualty insurance market that would be harmful to assureds and carriers alike.

In considering the development of such a plan recognition was given to the criticism that the current retrospective plan tabular minimum and maximum premium ratios were too rigid. Under the current compensation retrospective plans A, B and C which are in effect in a large number of states a particular sized risk may select Plan A in which the standard premium is the maximum or Plans B or C with comparatively high maximum ratios for all but the exceedingly large risks. There are many risks which prefer the retrospective type plan and are willing to assume a penalty for poor experience in return for a reward for good experience, but for which the present choices are not appropriate in that the possible saving under Plan A is not attractive enough and the Plan B or Plan C maximum is higher than the risk is able to assume. To solve this situation it was decided that a formula type plan should be adopted under which there would be an unlimited choice of maximum and minimum ratios. The values most appropriate for the risk could then be selected by the carrier and the assured and the proper insurance charge determined.

Retrospective Rating - Plan D is the name given to the over-all retrospective rating plan which has been developed by the National Council on Compensation Insurance. It is an interstate plan which provides for the optional combination for rating purposes of workmen's compensation with other third party liability lines. It will be filed only in those states and for those lines of insurance in such states for which rates and action in concert with respect thereto are subject to state regulation. The qualification point is $5,000 of annual standard premium for all lines combined subject to the plan. For lines other than workmen's compensation the plan does not apply to premiums or losses for coverage in excess of a limit of $10,000 per accident exclusive of allocated claim expense. The over-all minimum and maximum premium ratios for the risk are selected in advance by the assured and the carrier and the appropriate basic premium ratios are calculated separately for workmen's compensation and for other third party lines. The rules of the plan provide that rating values shall be calculated upon the basis of 50%, 100% and 150% of the total estimated annual standard premium. If desired, rating values may also be calculated for premium sizes below 50% and above 150% of the estimated annual premium. A table of the calculated rating values shall be made a part of the retrospective endorsement, and if the final total audited standard premium for the risk falls between any two of the amounts shown in the table the final rating values for the risk shall be obtained by straight line interpolation between the corresponding tabular values. The loss conversion factor may also be selected by the assured and the carrier, but shall not be greater than 1.13 for stock carriers or 1.30 for non-stock carriers.

In developing the rating values for this plan the first problem for consideration was the determination of proper insurance charges - that is the charge for losses in excess of the maximum premium less the expected saving on the minimum premium. There was available the current table of compensation excess pure premium ratios which underlies the present compensation retrospective plans, but this table is on a standard premium basis. Since several lines of insurance with different permissible loss ratios are involved in Plan D the table could not be used in its present form. Therefore "Table M" was evolved, which is the current table of excess pure premium ratios converted from a premium to an expected loss basis. As a measure of the dispersion of losses about the expected it may be used for any expected loss ratio. The next problem was whether this table, which was developed from compensation experience, could be used for other third party liability lines. Since unit reports are not available for automobile and other liability insurance, an exact check could not be made. However, the Actuarial Committee of the National Council reviewed the table and was of the opinion that it would produce satisfactory results for these lines when applied to expected losses for coverage within a $10,000 accident limitation. In view of the relationship of average claim costs between compensation and other third party liability lines this seems to be a reasonable conclusion. The average compensation claim cost (indemnity and medical combined and including non-compensable medical cases) for the first six months of policy year 1945, as compiled by the New York Compensation Insurance

Rating Board in June of 1947 amounted to $162. Compared with this the average incurred claim cost for one large carrier for the first nine months of calendar year 1947 for automobile and other liability and property damage combined was $151 based upon an incurred loss volume in excess of $21,000,000.

To determine the insurance charge for a particular risk the expected losses are determined separately for workmen's compensation and for other third party liability lines. For compensation the total expected losses are determined by multiplying the estimated annual standard premium for each state by the appropriate factor taken from the Table of Workmen's Compensation Expected Loss Ratios promulgated by the National Council. These expected loss ratios are those underlying the approved rates in each state. For lines other than compensation the expected losses are those contained in the carrier's approved filing for each state involved. When the total expected losses have been determined the "Table M" values are obtained for the selected maximum and minimum loss ratios based upon the total risk expected loss size. The net insurance charge is determined separately for compensation and other lines by multiplying the product of the expected lossed for the line and the "Table M" values by the loss conversion factor. When the net insurance charge has been determined it remains to add the proper expense costs to obtain the basic premiums for the risk. For workmen's compensation the total provision for expenses other than taxes is 17.5% of the expected losses representing claim, inspection and bureau expense plus the following percentages of the standard premium for acquisition, administration and audit:

For Stock Companies	For Non-Stock Companies
27.0% of first $1,000	27.0% of first $1,000
16.6 of next 4,000	22.1 of next 4,000
11.6 " " 95,000	19.2 all over 5,000
10.1 all over 100,000	

The non-stock carriers will use the above expense provisions in lieu of the Non-Stock Adjustment Factors applicable for Plans A, B and C. The provision for claim, inspection and bureau expense is taken as 17.5% of the expected losses so that a uniform percentage could be used for states with and without expense constants. The standard provisions are as follows:

	Expense Constant States	Non-Expense Constant States
Claim	8.3%	8.0%
Inspection & Bureau	2.6%	2.5%
	10.9%	10.5%
Expected Losses	62.5%	60.0%
17.5% Expected Losses	10.9%	10.5%

The stock company provisions for acquisition, administration and audit shown in the above gradation are the standard provisions in National Council states except for the first \$1,000, where they are the standard provisions in the non-expense constant states only. For the expense constant states the standard provision in the first \$1,000 is 24.1% instead of the 27.0% shown in the table. As a practical matter it was decided to avoid the use of two separate tables for National Council states since the difference between 27.0% and 24.1% applies to only the first \$1,000 of standard premium and makes a maximum difference of \$29 on risks which must be \$5,000 or over. Thus the maximum difference is 0.6% for a minimum sized risk, which reduces to less than 0.1% at the \$30,000 standard premium size. This difference is so small that it does not justify the use of a separate table and may very well be considered as part of the contingency loading. In addition to the above compensation expense provisions there shall be a contingency loading of 1%, which conforms to the present retrospective rating procedure.

The above expense provisions, less the provision for expenses in the loss conversion factor, shall be added to the net insurance charge to obtain the compensation basic premium. The expense provision in the loss conversion factor is the factor minus unity multiplied by the expected losses. For example, if the loss conversion factor is 1.13 and the expected loss ratio is 62.5%, the expense provision in the loss conversion factor is 8.1% of standard premium.

$$(1.13-1.0) \times .625 = .081$$

It is permissible to round the basic premium determined above providing that such rounding does not reduce the contingency factor to less than 0.5%. For lines other than workmen's compensation the expense provisions shall be in accordance with the carrier's approved filings for the states involved. It is provided, however, that the total provision for contingencies and expenses other than taxes for these lines shall not be less than 15% of the standard premium plus 13% of the expected losses for such lines. The reason for this provision is to make sure that the compensation premium can not be adversely affected by any changes in the distribution by line of insurance between the estimated and the final audited standard premium. If the liability expense allowance were permitted to be less than the above provision, the over-all maximum and minimum premiums would be lower than those contemplated by the insurance charges if the final audited liability standard premium should be a smaller percentage of the total than in the estimated. This would of course have an adverse effect upon the workmen's compensation insurance charges. To eliminate this possibility the minimum liability expense and contingency provision, excluding tax, was established as above. This is the same expense provisions as would be provided for workmen's compensation premium in excess of $5,000. This is shown in the following exhibit.

	Expense Constant State	Non-Expense Constant State
Compensation Claim, Inspection & Bureau	10.9%	10.5%
Compensation Acquisition, Admin. & Audit	11.6	11.6
Compensation Minimum Contingency Factor	0.5	0.5
	23.0	22.6
Less 13% of Expected Losses	-8.1	-7.8
	14.9	14.8

The above figures of 14.9% and 14.8% were rounded to 15%.

For risks involving ex-medical workmen's compensation coverage, the Plan D rating values are calculated by using the ex-medical standard premium. The compensation basic premium ratio determined in this manner is then multiplied by the ratio of the full medical standard premium to the ex-medical standard premium. The increased basic premium ratio is then applied to the ex-medical standard premium in rating the risk. This is the same procedure as is currently applied to retrospective Plans A, B and C.

The determination of the final retrospective premium under Plan D is in accordance with the following formula.

Retrospective Premium = [Basic Premium + (Losses x Loss Conversion Factor)] x tax multiplier.
(Subject to minimum and maximum premiums)

The premium for each state and line of insurance is allocated on the basis of its own indications. For each state, separately for each line of insurance, the standard premium times the basic premium ratio is added to the actual converted losses and the sum multiplied by the appropriate tax multiplier. If the total retrospective indicated premium for the risk is over the maximum the indicated premium for each state and line of insurance is multiplied by the ratio of the over-all maximum to the over-all indicated premium. A similar procedure is followed if the total indicated retrospective premium is under the minimum.

It will be recalled that the rating values to be applied to the final audited standard premium are taken from the table of rating values contained in the retrospective rating endorsement. The values in this table are calculated for 50%, 100% and 150% of the estimated annual standard premium, and if the final audited standard premium falls between any two of the premium sizes in the table the rating values shall be obtained by using straight line interpolation between the tabular values shown. Tests have been made to determine the propriety of this interpolation procedure, and in every case the result is to provide a small additional safety margin in the insurance charge while maintaining the proper expense provisions. This result has been confirmed by a large number of similar tests made by the Connecticut Insurance Department. An example of the safety margins may be shown for a compensation risk with an estimated annual standard premium of $25,000 and expected losses of $15,000. If a maximum premium ratio of 126% and a minimum premium ratio of 56% are selected for the risk the appropriate basic premium ratios are 20.6% for the $25,000 premium size and 28.2% for the $12,500 premium size, with a loss conversion factor of 1.13. The basic premium ratios obtained by interpolation for the $15,000 and $20,000 premium sizes respectively are 26.7% and 23.6%. These interpolated basic premium ratios contain a safety margin of 0.6% and 0.9% respectively over what would be provided by the actual basic premium ratios calculated for these premium sizes.

It is believed by the proponents of Retrospective Rating - Plan D that the plan is actuarially sound and will represent a desirable step forward in the rating of sizeable casualty risks. The plan has been so designed as to provide ample safeguards and safety margins so that the integrity of the workmen's compensation rating procedure will in no way be endangered by the combination for rating purposes of workmen's compensation and other third party liability lines.

EXPERIENCE RATING FORM-SUMMARY SHEET FOR INTERSTATE RISKS

EXHIBIT A

Name of Risk ______________________________ Effective Date ____________

(1)	(2) Total Expected Losses by State	(3)	(4) Rating Values (Based on Item 2a)	(5)	(6) Excess Losses	(7)	(8) Primary Losses	(9)
State	Post Item (d) ERM-1 or 2	Ratio of Item (2) to Total (2a)	"W"	"B"	Actual Post Item (c) ERM-1 or 2	Expected Post Item (f) ERM-1 *	Actual Post Item (b) ERM-1 or 2	Expected Post Item (e) ERM-1 or 2
Total or Average	(a)	1.000	(b)	(c)	(d)	(e)		

(10) Average "B" Value	Item (5c)	Item (5c)
(11) Ratable Excess	(4b) x (6d)	(4b) x (7e)
(12) Totals	(f)	(g)
(13) Experience Mod. (f) ÷ (g) ________	Charge %	Credit %

Notes

(4b) = Sum of [(3) x (4)]

(5c) = Sum of [(3) x (5)]

* For ratings involving ex-medical exposure Post in Column (7) Item (g) form ERM-2

Adjusted rates resulting from this modification shall be subject to the approval of the Bureaus having jurisdiction.

ERM-7

MASSACHUSETTS WORKMEN'S COMPENSATION RATE MAKING-PRIMARY-EXCESS BASIS

by

L. W. SCAMMON

Workmen's Compensation Rates in Massachusetts, planned to become effective December 31, 1947, are based on classification pure premiums produced by the Primary-Excess method. Herein culminates more than two years of research on this subject. This development may well usher in a new basis of pure premium selection generally, for depending upon how satisfactorily this basis of pure premium selection works out in Massachusetts, other jurisdictions are bound to be influenced.

In this paper I will attempt to narrate the pertinent factors in this research. However, I make no pretense to originality in much of the material presented herein. The members of the Actuarial Committee of the Massachusetts Bureau individually and collectively have contributed most in the preparation of this new basis of pure premium selection.

This outline of the development of Workmen's Compensation Rates in Massachusetts on the Primary-Excess basis is the piecing together of various records and ideas expressed as research was in process. The original thought that multisplit treatment of losses could be used to advantage in the making of Workmen's Compensation Classification rates probably goes back to the period a few years before the war when the present Experience Rating Plan involving this principal was under consideration. The war effectively stopped any tangible results along this line although during the war the thought was sometimes expressed that certain weaknesses in the Standard Rate Making procedure could be overcome if, instead of dividing the losses between Serious, Non-Serious, and Medical, they could be segregated between Primary and Excess losses by classification.

Designation of Massachusetts as the state for original research on this subject was logical. One of the larger volumes of experience is here represented; no problem of ex-medical policies presented itself; tabulating research to prepare the necessary volume of losses split to Primary and Excess on punch cards could be effectively handled; and State Insurance officials early expressed an interest in the Primary-Excess method of pure premium selection.

Little need be said in explanation of the Primary-Excess split of losses since this basic idea has been so well established in the current Experience Rating Plan. All compensable Massachusetts losses below $400, indemnity and medical combined, are considered Primary losses. Above $400 all losses are split between Primary and Excess in accordance with a geometric progression designed to produce a maximum primary of \$1,200. For example, a given loss of \$2,200 is divided between Primary and Excess as follows:

$$\begin{aligned}\$2,200 &= 400 + 400 + 400 + 400 + 400 + 200\\ \text{Primary} &= 400\ (2/3)^0 + 400\ (2/3)^1 + 400\ (2/3)^2 + 400\ (2/3)^3 +\\ &\quad 400\ (2/3)^4 + 200\ (2/3)^5\\ &= 1\ 068\\ \text{Excess} &= 2\ 200 - 1\ 068 = 1\ 132\end{aligned}$$

In practice the Primary values are taken from tables which approximate the above results.

Thus the basic plan is to present the classification experience with the losses split between Primary and Excess rather than between Serious, Non-Serious, and Medical.

Of fundamental importance is the consideration that since all losses, large and small, contribute to the limited values of the Primary, substantial credibility can be assigned to Primary losses, and while little credibility can be assigned to Excess, greater average credibility can be assigned to losses split on the Primary-Excess basis than under the Standard basis, in which losses are not limited in any way, with the result that more reliable rates can be made from the same amounts of losses.

It should be emphasized at this point that the Primary-Excess method attacks the problem of producing better rate relativities by class and does not affect overall rate level. The same rate level will be produced by either method.

PRELIMINARY STUDY

Preliminary work was first attempted early in 1945 when the Standard revision of the previous fall involving policy years 1941 and 1942 was prepared on the Primary-Excess basis and the results compared. Not too much thought was given at the time to the matter of credibility., and the method used gave a high degree of credibility to the Primary losses with the result that the Primary-Excess answers more closely followed the indications of the experience than did those on the Standard basis. Such minor law amendments as required attention were reflected by flat overall factors. Even though several major questions, especially those relating to credibility and application of law amendment, were left unanswered it was generally agreed that the method merited further study. A year later it was decided that research into the Primary-Excess basis of making workmen's Compensation rates should be undertaken by the Bureau to see if solutions could be found to certain problems inherent in such a rating basis as well as to find out whether the Primary-Excess method would produce better rates than the Standard basis.

BASIC RESEARCH

In this early work certain facts became obvious. The splitting of losses to Primary and Excess portions is a Bureau job. This leaves unchanged the company reporting of data. While a high degree of care must be exercised in doing the job, a competent tabulating clerk can rapidly acquire the knowledge necessary to split a year's reporting of losses to Primary and Excess. The approximate Massachusetts annual volume of $14,000,000 losses distributed among 35,000 claims can be processed in four or five days by one tabulating clerk, assisted by a sorting clerk. Several policy years should be analyzed to provide sufficient volume for thorough study.

The experience of six full years 1939 through 1944 has been analyzed on the Primary-Excess basis in Massachusetts, the earlier years reflecting third or second reportings. The method used in accomplishing this is appended, including an explanation of cross-adding on the Tabulating Machines to combine indemnity and medical amounts on individual cases. (See Appendages 1 and 2)

Numerous tabulations were prepared to see if fundamental laws and relationships could be established from the Primary-Excess figures.

The stability of Primary figures was immediately impressive. Average case costs from year to year were very close when reviewed within Kinds of Injury and Industry Schedule. The Primary portion of individual classification pure premiums showed stability from year to year even on fairly small volumes of experience. However, the Excess portion showed no such tendencies. Attempted analyses of Excess losses from year to year by Industry Schedule and Group showed little in the way of stability. (Appendages 3, 4, and 5 represent some of the research and may prove of some value in other jurisdictions.)

CREDIBILITY ASSIGNMENT

Noting the stability of Primary average case cost throughout our tabulations, it was suggested that the use of an actual case count as the basis of credibility under the Primary-Excess method would avoid weaknesses in our present method of determining credibility from the pure premium underlying the given rate as applied to payroll. The old National experience which is primarily the base underlying the pure premium for many small classes may bear little relationship to the true credibility of the class. Also, where rate level is out of line it is hard to justify credibility calculated from such out of line pure premiums.

As a guide in determining the number of cases needed for full credibility, Mr. Perryman's paper Some Notes on Credibility (*Proceedings* Vol. XIX) was cited. His conclusions were interpreted to mean that a properly sampled volume of exposure producing 2,653 cases would on further sampling 99 times out of 100 produce within 5% of the same number of cases. Similarly 271 cases, 90 times out of 100, would be reproduced within a variance of 10%

Committee agreement to base full Primary credibility on 250 Primary cases and full Excess credibility on 500 cases was reached after much consideration. Pertinent in this decision was agreement by the Massachusetts, New York, and National Council Actuarial Committees, in joint session in New York, that actual number of cases constitutes a simple, practical method of assigning credibility and one which gives a little more credibility to the class having higher actual than expected loss frequency.

The credibility table follows:

Credibility Based on Standard Formula

$$A = \sqrt{W^3}$$

W	$\sqrt{W^3}$	Actual No. of Cases Primary Zp	Excess Ze(also Z and Zt)
100	1.0000	250	500
90	.8538	213	427
80	.7155	179	358
70	.5857	146	293
60	.4648	116	232
50	.3536	88	177
40	.2530	63	127
30	.1643	41	82
20	.0894	22	45
10	.0316	8	16
5	.0112	3	6

APPLICATION OF LAW AMENDMENTS

It was known from the beginning that one of the chief obstacles to this basis of rating would be the applying of law amendments. This phase of the research was contributed largely by one committee member and a satisfactory method of application was devised. Treatment of this matter herein is sketchy and it is hoped that this subject may engage the energies of some members of the Society to further efforts along this line.

For purposes of calculation of law amendment factors, law amendments are divided into two broad classes. Included in the first class are the law amendments which increase the percentage of weekly benefits or which increase the maximum or minimum weekly benefits. This particular type of law amendment generally can be measured by a flat percentage to apply to all sizes of losses. All other law amendments are assigned to a second classification which includes such amendments as changes in waiting periods which virtually all go into the Primary losses or to extensions of the maximum period or amount which go largely into Excess losses.

The increased benefits of the new over the old law can be expressed in symbols as follows:

	Losses (Old Law)	Losses (Amended Law)	Loss Increase
Total	A	A'	A' - A = Δ A
Primary	Ap	A'p	A'p - Ap = Δ Ap
Excess	Ae	A'e	A'e - A = Δ Ae

Basic Ratio = Δ Ap/ Δ A

In a series of increasing law amendments the basic ratio corresponding to an amendment increasing the law by a specific amount is greater than the basic ratio corresponding to an amendment which increases the law by greater amounts. Also the limit of the basic ratio corresponding to an amendment approaches zero as the value of the amendment becomes increasingly large and the limit of the basic ratio corresponding to a specific amendment can not exceed the "D" ratio as the value of the amendment becomes increasingly small. These principles may be stated in symbols as follows:

$$\Delta Ap/ \Delta A > \Delta A'p/ \Delta A', \text{ where } \Delta A < \Delta A'$$

$$\underset{\Delta A \doteq \infty}{\text{Limit}}\ \Delta Ap/ \Delta A \doteq 0, \text{ and } \underset{\Delta A \doteq 0}{\text{Limit}}\ \Delta Ap/ \Delta A \not> D$$

Appendage 6 shows in tabular form calculations of the effect on Primary and Excess losses produced by a law amendment increasing by 10% all temporary total losses, indemnity and medical combined. Assuming that medical benefits have not increased this is equivalent to 15.5% increase on indemnity losses. Column (12) of this exhibit shows that it would be necessary to apply a factor of 1.08659 to the Primary losses and a factor of 1.18912 to the Excess losses to bring them to the new law level. The basic ratio shown in Column (13) is .7526

Using these principles and the calculated values of many Basic Ratios a chart was constructed showing a curve for each type of injury in which the Basic Ratio is a function of the size of the law amendment. These charts based on the Massachusetts loss distributions are to be used to determine factors to be applied to Primary and Excess losses to reflect a specific law amendment.

The method by which the effect on Primary and Excess losses produced by Masaachusetts law amendments amounting to 1.207 in 1945.

Exhibit I **MASSACHUSETTS**

CLASSIFICATION EXPERIENCE
PRIMARY-EXCESS BASIS

SCH.
& GR. 182 CODE 3635 CLASS Gear Mfg. or Grinding

YEAR	PAYROLL	NO.	PRIMARY AMOUNT	P.P.	NO.	EXCESS AMOUNT	P.P.	TOTAL AMOUNT	P.P.
1935-38	4 597 589	58	xxxx	xx	xx	xxxx	xx	19 015	.41
1939	1 381 655	16	4 715	.34	2	838	.06	5 553	.40
1940	2 507 514	20	5 304	.21	1	123		5 427	.21
1941	5 525 028	45	13 309	.24	3	101		13 410	.24
1942	8 607 488	65	20 617	.24	7	2 294	.03	22 911	.27
1939-42	18 021 685	146	43 945	.24	13	3 356	.02	47 301	.26
1943	14 511 574	123	43 790	.30	18	16 325	.11	60 115	.41
1944	13 257 698	79	26 982	.20	9	3 117	.02	30 099	.22
1943-44	27 769 272	202	70 772	.25	27	19 442	.07	90 214	.32
1939-44	45 790 957	348	114 717	.25	40	22 798	.05	137 515	.30
1935-44	50 388 546	406	xxxx	xx	xx	xxxx	xx	156 530	.31

"D" Ratios			PURE PREMIUMS						Zt =80
(a) Present		.90	Underlying	.47		.05			.52
(b) Pres. on Rate Level		.83	Underlying on Rate Level	.44		.09			.53
(c) Indicated 1943-44		.78	Derived 1935-44	.29		.06			.35
(d) Indicated 39-44	Z= 70	.83	Indicated 1943-44	.25	Zp=80	.07	Ze=10		.32
(e) Formula (d)Z+[(b)x(1-Z)]		.83	Formula	.26		.06			.32
(f) Proposed			Proposed						

and amounting to 1.099 in 1946. is shown (See Appendages 7 and 8.) It will be noted in the case of these two amendments that the effect on Excess losses is very substantially greater percentagewise than on Primary losses.

LIMITATION OF VALUE FOR A SINGLE ACCIDENT

A simple effective means is used for handling catastrophe cases which, at the same time, overcomes a weakness in the Standard rate making procedure. The maximum value of any accident is limited to $25,000 and in any such accident involving multiple claims the Primary value is limited to $2,400

DEVELOPMENT OF LOSSES

Positive development of losses is the rule in Massachusetts due to the nature of the law. Several policy years were analyzed to measure the effect of development under the Primary and Excess split. It was found that aggregate Primary losses continue at approximately their first reporting values with a tendency toward negative development, and such positive development as occurs, appears only on the Excess losses. Thus the development factors used in the Primary-Excess method have been to increase Excess losses and to leave Primary losses unadjusted or slightly decrease them.

EXPERIENCE PRESENTATION

Of major importance is the selection of the experience period. It may not be sufficient to proceed with only the rate level period on the Primary-Excess basis if satisfactory rates are to be developed because it is important to have adequate underlying pure premiums properly split.

The choice of alternatives lies between, (1) developing new underlying pure premiums; (2) producing satisfactory Primary or "D" ratios by means of which underlying pure premiums can be split between Primary and Excess and; (3) some combination of (1) and (2).

In Massachusetts the underlying pure premiums were not altogether satisfactory and a method was devised for simultaneously bolstering the underlyings and extending the rate level period when too little credible experience was available in the smaller classes and particularly in the Excess portion of all classes.

Into the preparation of the form for presentation of the Primary-Excess experience by classification went so much thought to obtain maximum use of available experience that detailed consideration and explanation of this form and how the experience is used, depending upon the credibility, is desirable. Classification 3635, Gear Mfg. and Grinding, is used as an example. (See Exhibit I).

Ten years of experience with losses converted to rate level is used in order to obtain a maximum of information about the Massachusetts experience of small classes and to improve the underlying pure permiums. No Primary-Excess split is available for policy years 1935-38; hence these are used combined for total pure premium indication. The years 1939-42 are separately presented with losses split between Primary and Excess. Rate Level years 1943-44 are shown. separately and combined and the 1939-44 combined Primary-Excess split is shown. Ten year 1935-44 total pure premium completes the experience exhibited

To establish the best possible "D" ratio information a section of the form is devoted thereto. Starting with (a) the experience rating "D" ratio for the class, on successive lines are shown; (b) Underlying "D" ratio on rate level, obtained from corresponding underlying pure premiums on rate level; (c) the indicated 1943-44 and (d) 1939-44 "D" ratios, and (e) a weighted "D" ratio obtained by weighting Underlying "D" ratio on rate level and 1939-44 "D" ratio in accordance with Credibility Z.

The pure premium section of the form warrants full explanation: (1) Underlying pure premiums split to Primary and Excess by the experience rating "D" ratio are followed by; (2) Underlying pure premiums on rate level which are obtained separately for Primary and Excess by adjusting item (1) by Industry Group rate level index numbers, calculated by dividing 1943-44 Industry Group rate level losses by corresponding expected losses, in turn obtained by multiplying underlying pure premiums by 1943-44 payrolls; (3) Derived 1935-44 pure premium, in effect a bolstered underlying, is a weighted pure premium obtained in total from the ten year 1935-44 pure premium and total underlying on rate level in accordance with credibility Zt, and split for Primary and Excess by the line (e) Formula "D" Ratio; (4) 1943-44 indicated rate level pure premiums are brought down from the upper part of the exhibit; and, (5) Formula pure premiums are obtained by weighting Indicated and Derived pure premiums in accordance with Credibility Zp and Ze.

There follows an explanation of how the Primary-Excess method utilizes the advantages of the multisplit treatment of losses in a systematic method of assembling data for deriving pure premiums compatible with good underwriting judgment. Ten years of experience is shown but is only used to the extent that a class receives less than full credibility for its latest two-year indications. Large classes are to a great extent rated on the experience of the latest two years, e.g. two-year Primary indications may receive 100% credibility and be used exactly - Excess indications may receive 40% credibility in which case the formula Excess is obtained from 40% of the two-year Excess indications and 60% of the Derived 1935-44 Excess.

For smaller classes more credibility is given to the experience of the earlier years as more reliance is placed on the Derived

1935-44 pure premium - still smaller classes rely on the Derived 1935-44 which contains a larger and larger proportion of Underlying on Rate Level as the actual amount of available experience diminishes. Thus a method is devised which gleans a maximum of worth from the Massachusetts experience available and leaves fewer classes in the non-reviewed category.

CONVERSION OF LOSSES TO RATE LEVEL

The losses for the Rate Level years 1943 and 1944 were adjusted by development and law amendment factors, and Rate Level Index numbers calculated by dividing actual losses by expected losses for each Industry Group separately for Primary, Excess, and Total. By dividing 1943-44 Index Numbers by Index Numbers of the other years, Rate Level factors were established for converting the raw losses of the earlier years to rate level. Index Numbers for 1935-38 combined and 1939-42 separately were calculated by dividing actual losses by expected losses for each Industry Group separately for Primary and Excess for the latter years but in total only for 1935-38. Expected losses in both calculations were payrolls by class multiplied by underlying pure premiums. A detailed explanation of the method used in making the factor calculations is appended. (See Appendage 9).

Tabulating methods were used to advantage throughout this work. A multiplying punch was used for extensions in order to prepare punch cards by classification for all losses converted to rate level. In this manner hand calculating was minimized and the classification experience was then run off from these punch cards directly onto the classification master sheet in "ditto". Pure premiums were calculated and these and "D" ratios inserted by typewriter. Sufficient copies were then made by the "ditto" process.

ADVANTAGES OF PRIMARY-EXCESS METHOD

Probably the biggest advantage of the Primary-Excess method is that in the Primary indications is concentrated in one spot more valid information than has previously been available for each classification, the only exceptions being the very large and the very small classes. The stability of the Primary pure premium is noticeable even where there is not a very great volume of experience and constitutes an advantage which will definitely improve the derivation of pure premiums.

Under the Standard procedure mis-assigned losses and, in Massachusetts where second reportings are used, changed status of losses on second reporting may affect selected pure premiums when corrections cause pure premium shifts between serious and non-serious portions. Under the Primary-Excess procedure the effect on the final rate of a given loss is determined entirely by its size, not by its type.

The Standard method generally provides high credibility for medical losses which occasionally results in giving undue emphasis to a single claim with unusually large medical. Single claims with medical cost as high as $35,000 have been reported in Massachusetts. The Primary-Excess method automatically avoids this difficulty.

Another advantage of the Primary-Excess method, as developed in Massachusetts, not to be overlooked is the trueing up of pure premiums by the ten-year review. This applies not only to many non-reviewed classes but also to the parts of the small reviewed classes which have too little credibility to have changed over some period of time.

In jurisdictions outside of Massachusetts it has been noted that the proposed pure premiums for some of the reviewed classes have been consistently out of line with the actual indications for a period of years. Correction of these departures may take several years under the Standard rate making procedure because of the small volume of serious, non serious, and medical experience available for an individual class in any given two-year period. Furthermore in the State of New York, the Insurance Department has called attention to the lack of any practical procedure for revising the rate relativities of the non-reviewed classes. It is believed that problems of this nature in connection with the non-reviewed or the smaller reviewed classes can be handled better under the Primary-Excess method.

COMPARISONS PRIMARY-EXCESS VS. STANDARD BASIS

It is anti-climatic to have to explain that after parallel rate revisions were prepared in the Fall of 1946, one on the Standard and one on the Primary-Excess basis as outlined, the decision that the revision should continue on the Standard basis was apart from any detailed consideration of the relative merits of the two methods and was largely based on the fact that law amendments were forcing too great an increase in rate level to complicate matters further with a change in method of establishing pure premiums.

The Primary-Excess presentation was not complete at the time this decision was reached and the problem of reconciling the formula pure premium results with the rate level indications were left as unfinished business until this past Spring when it was again decided that parallel revisions would be prepared thus allowing an opportunity to utilize the previous year's Primary-Excess formula pure premiums as underlying pure premiums and to allow class by class comparisions of Primary-Excess and Standard results through a second complete revision.

Tests indicated that the Primary-Excess formula pure premiums showed an overall variation from rate level indications of less than 1%, hence no correction was deemed necessary in their use as underlying pure premiums.

EXHIBIT II

RATE MAKING - PRIMARY-EXCESS MASSACHUSETTS

Sch. &
Group 182 Code 3635 Class Gear Mfg. or Grinding

POLICY YEAR	PAYROLL (IN HUNDREDS)	PRIMARY 60			EXCESS 10			TOTAL	
		NO.	AMOUNT	P. P.	NO.	AMOUNT	P. P.	AMOUNT	P. P.
1944	13 257 7	81	29 698	.22	11	12 037	.09	41 735	.31
1945	9 269 7	57	23 542	.25	9	2 031	.02	25 573	.27
TOTAL	22 527 4	138	53 240	.24	20	14 068	.06	67 308	.30
P. P.: Primary-Excess Underlying on Rate Level				.25			.06		.31
P. P.: Derived by Formula				.24			.06		.30
P. P.: Primary-Excess Underlying				.26			.06		.32
P. P.: Proposed									

SECOND PREPARATION OF PARALLEL REVISIONS

The presentation of the experience on the Primary-Excess basis for the current revision is straightforward and quite closely follows the standard pattern. Again, Class 3635, Gear Mfg. or Grinding, is presented. (See Exhibit II)

The rate level years 1944 and 1945 are presented separately and combined with losses adjusted for law amendment and development. The loss experience is shown for Primary, Excess, and Total with actual number of cases also shown for credibility purposes.

Primary-Excess underlying on Rate Level is obtained by adjusting the Primary-Excess Underlying for each class by the ratio of 1944-45 rate level losses by Industry Group to Corresponding Primary-Excess underlying pure premiums multiplied by 1944-45 payrolls.

Sound acturial principles dictate that final pure premiums in most instances be derived by formula calculated by weighting Primary and Excess indications and Underlying Primary and Excess pure premiums on rate level in accordance with credibility, but smooth transition from the Standard basis to the Primary-Excess method may cause some deviation from this procedure. If such deviation materializes it is suggested that formula pure premiums be carried over to the following year as the true underlying in order that expedient selections may not permanently affect the underlying.

Appendage 1

PROCEDURE FOR OBTAINING PRIMARY-EXCESS SPLIT

Loss cards for a given year are sorted for Indemnity within Medical and hand-placed into two groups, as follows:

1. Losses having a combined Indemnity plus Medical amount of $ 400 or less.

2. Losses having a combined Indemnity plus Medical amount of $ 400 or over.

The first group is summary-carded by Kind of Injury within Class, crossfooting Indemnity plus Medical losses and punching the combined amount in two fields, Incurred amount and Primary amount (undiscounted in this case).

The second group is crossfooted, case by case, and placed in a range of incurred loss amounts and the Primary Rating Value of the incurred amount is assigned and gangpunched. These cards are then re-summary-carded, punching Incurred Amount, Primary Amount, and Excess Amount (a crossfooting of Incurred minus Primary).

From the combined summary-carded results of the first and second groups, the Primary-Excess split of losses by Kind of Injury and Classification is obtained.

Appendage 2

CROSSFOOTING ON TYPE 405 ALPHABETIC ACCOUNTING MACHINE

The following is a description of a method which will enable the adding together of two amounts punched on the same card. This method will also allow the subtraction of one amount from the other as well as the printing of net balances resulting from the adding and subtracting of any combination of plus and minus amounts. The ability of the machine to summary punch the crossfooted results is probably the most important and useful application of this device.

We wish to point out that these ideas are not entirely our own, but we do believe that we have developed them to the point where they can be of practical use in many ways. As far as we have been able to determine, no "Pointers" have been distributed by International Business Machines demonstrating this or any other similar procedure. There are, however, "Pointers" on Crossfooting which are rather limited in scope.

In instances where a sum of fields A and B is needed, the totals of fields A and B are accumulated in separate counter groups. The accumulated amount in Counter Group 2 is transferred to and combined with the amount already accumulated in Counter Group 1 when a specially inserted X-punched "trailer" card passes the lower brushes. This "trailer" card (blank except for an X punch in any available column) must follow each control change and can easily be inserted by the tabulating clerk at the time of tabulation. Care must be exercised in the placing of these "trailer" cards inasmuch as the omission of them will nullify the crossfooting operation.

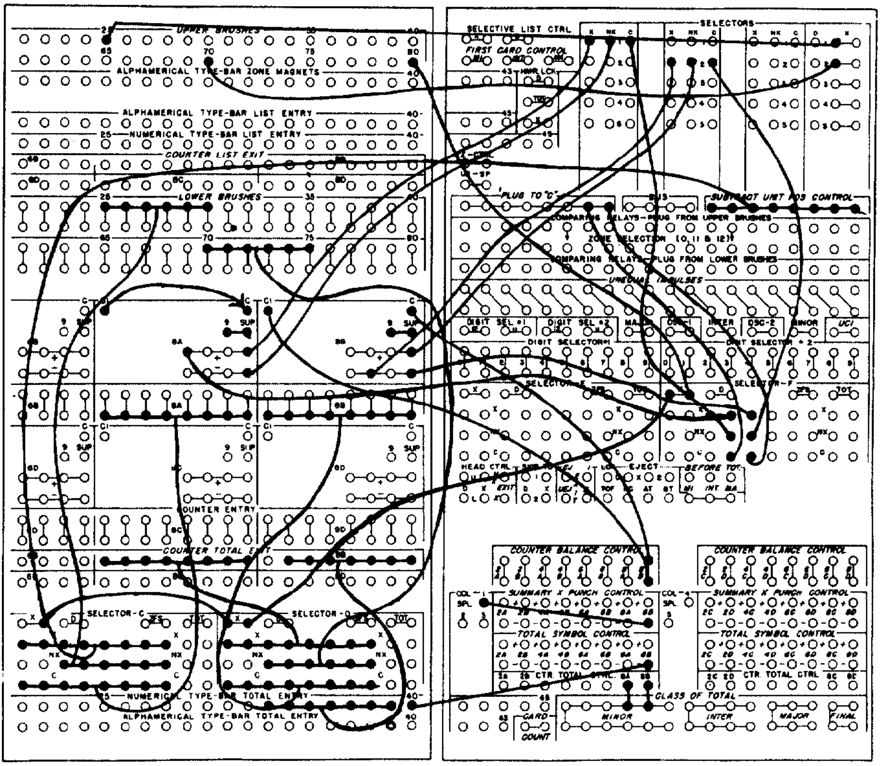
It is important for those who contemplate using this device to carefully consider certain limitations caused by the problem of inserting the "trailer" cards. Tabulations where the control breaks are frequent are naturally more cumbersome than those where control breaks occur less frequently.

An optional method may be used whereby a permanent file of X-punched "trailer" cards containing every possible combination of control information may be established. These cards may be inserted by either sorting or collating. This method would eliminate the need for the special plugging necessary to prevent the extra spacing caused by the presence of the "trailer" card.

MASS. RATING BUREAU

Appendage 2

CROSSFOOTING OF TWO AMOUNTS ON A SINGLE CARD
ON THE STANDARD TYPE 405 ALPHABETIC ACCOUNTING MACHINE



1. Plugging of X - Selector 1 adds minus cards and subtracts plus cards in Transmitting Counter 8 A.

2. Plugging of X - Selector 2 adds plus cards and subtracts minus cards in Receiving Counter 8 B.

3. Class Selector plugged to actuate Counters 8 A and 8 B by NX - 80 impulses.

4. Summary X - Punch Control plugged to designate negative amounts on Summary card when Summary punching is used.

5. All "Trailer" cards must be punched X - 80 or in some other available column to actuate Class Selectors and to cause crossfooting.

6. Had the problem been A - B = C, the Transmitting Counter 8 A would have been plugged to add by wiring directly to a Plug to "C" hub; whereas the plugging of the Receiving Counter 8 B would remain unchanged.

PRIMARY-EXCESS

BY TYPE OF INJURY

ALL INDUSTRY GROUPS COMBINED

		PRIMARY				EXCESS				TOTAL		
	Payroll	No. Cases	Amount	P.P.	Av.Cl. Cost	No. Cases	Amount	P.P.	Av.Cl. Cost	Amount	P.P.	Av.Cl. Cost
DEATH												
1939	1 272 025 905	157	162 740	.01	1 037	155	363 776	.03	2 347	526 516	.04	3 354
1940	1 462 070 691	179	184 635	.01	1 031	177	464 746	.03	2 626	649 381	.04	3 628
1941	1 824 600 667	172	184 560	.01	1 073	172	423 777	.02	2 464	608 337	.03	3 537
1942	2 165 447 671	217	236 230	.01	1 089	217	584 874	.03	2 695	821 104	.04	3 784
1943	2 346 455 996	208	230 566	.01	1 108	207	732 429	.03	3 538	962 995	.04	4 630
Total	9 070 600 930	933	998 731	.01	1 070	928	2 569 602	.03	2 769	3 568 333	.04	3 825
P. T.												
1939		18	21 600	-	1 200	18	250 857	.02	13 937	272 457	.02	15 137
1940		25	29 990	-	1 200	25	307 396	.02	12 295	337 386	.02	13 495
1941		26	31 200	-	1 200	26	407 987	.02	15 692	439 187	.02	16 892
1942		27	32 400	-	1 200	27	346 966	.02	12 851	379 366	.02	14 051
1943		10	12 000	-	1 200	10	155 380	.01	15 538	167 380	.01	16 738
Total		106	127 190	-	1 200	106	1 468 586	.02	13 854	1 595 776	.02	15 054
MAJOR												
1939		473	486 770	.04	1 029	472	796 147	.06	1 687	1 282 917	.10	2 712
1940		525	544 100	.04	1 036	525	925 236	.06	1 763	1 469 336	.10	2 799
1941		570	600 550	.03	1 053	570	1 091 442	.06	1 915	1 691 992	.09	2 968
1942		682	732 340	.03	1 074	681	1 402 743	.07	2 060	2 135 083	.10	3 131
1943		744	791 570	.03	1 064	744	1 374 698	.06	1 848	2 166 268	.09	2 912
Total		2 994	3 155 330	.04	1 054	2 992	5 590 266	.06	1 867	8 745 596	.10	2 921

Appendage 3

PRIMARY-EXCESS - BY TYPE OF INJURY

ALL INDUSTRY GROUPS COMBINED

		PRIMARY				EXCESS				TOTAL		
	Payroll	No. Cases	Amount	P.P.	Av.Cl. Cost	No. Cases	Amount	P.P.	Av.Cl. Cost	Amount	P.P.	Av.Cl. Cost
MINOR												
1939	1 272 025 905	785	323 058	.03	412	354	42 787	-	121	365 845	.03	466
1940	1 462 070 691	918	371 780	.03	405	396	45 811	-	116	417 591	.03	455
1941	1 824 600 667	1 169	464 096	.03	397	503	48 418	-	96	512 514	.03	438
1942	2 165 447 671	1 165	472 380	.02	405	548	54 136	-	99	526 516	.02	452
1943	2 346 455 996	1 136	456 208	.02	402	541	51 421	-	95	507 629	.02	447
Total	9 070 600 930	5 173	2 087 522	.03	404	2 342	242 573	-	104	2 330 095	.03	450
TEMPORARY												
1939		19 624	3 084 250	.24	157	1 709	529 333	.04	310	3 613 583	.28	184
1940		22 102	3 362 129	.23	152	1 791	505 885	.03	282	3 868 014	.26	175
1941		27 197	4 144 479	.23	152	2 123	573 281	.03	270	4 717 760	.26	173
1942		29 346	4 611 106	.21	157	2 400	644 085	.03	268	5 255 191	.24	179
1943		30 287	5 027 807	.22	166	2 807	775 915	.03	276	5 803 722	.25	192
Total		128 556	20 229 771	.22	157	10 830	3 028 499	.04	280	23 258 270	.26	181
MEDICAL												
1939			937 150	.07		(9)	3 835	-	426	940 985	.07	
1940			1 133 948	.08		(5)	2 125	-	425	1 136 073	.08	
1941			1 385 441	.08		(13)	1 303	-	100	1 386 744	.08	
1942			1 409 449	.07		(7)	1 291	-	184	1 410 740	.07	
1943			1 326 388	.06		(6)	351	-	59	1 326 739	.06	
Total			6 192 376	.07		(40)	8 905	-	223	6 201 281	.07	

Appendage 4

PROPORTION OF MEDICAL TO INDEMNITY

BY SIZE OF LOSS GROUPINGS

POLICY YEAR 1943

Size of Indemnity	(1) Indemnity Amount	(2) Medical Amount	(3) No. of Cases	(4) Ratio (2)÷(1)
0- 49	129 315	67 632	6 682	.523
50- 99	445 014	179 284	8 642	.403
100- 149	387 238	165 782	4 533	.428
150- 199	298 224	140 444	2 549	.471
200- 249	260 444	128 413	1 754	.493
250- 299	271 287	153 850	1 554	.567
300- 349	290 093	187 238	1 489	.645
350- 399	203 203	121 635	873	.599
400- 499	304 754	169 126	1 077	.555
500- 599	218 976	109 919	606	.502
600- 699	163 311	87 129	389	.534
700- 799	138 238	66 545	274	.481
800- 899	111 106	57 304	200	.516
900- 999	88 885	40 844	138	.460
1,000- 1,199	176 561	77 267	236	.438
1,200- 1,399	168 411	64 803	180	.385
1,400- 1,599	134 016	55 060	127	.411
1,600- 1,799	139 642	37 915	104	.272
1,800- 1,999	113 835	33 402	78	.293
2,000- 2,499	321 397	104 129	195	.324
2,500- 2,999	301 233	65 534	136	.218
3,000- 3,499	293 096	80 379	117	.274
3,500- 3,999	274 662	66 922	93	.244
4,000- 4,499	253 709	43 013	70	.170
4,500- 4,999	204 326	39 453	52	.193
5,000- 5,999	650 475	90 297	140	.139
6,000- 6,999	210 487	42 741	40	.203
7,000- 7,999	185 096	28 932	29	.156
8,000- 8,999	52 000	14 802	8	.285
9,000- 9,999	36 485	10 496	5	.288
10,000-19,999	133 556	19 759	12	.148
20,000-29,999	47 791	3 274	2	.069
40,000-49,999	12 805	35 000	1	2.733
Total	7 019 671	2 588 323	32 385	.369

Appendage 5

PRIMARY-EXCESS

DISTRIBUTION OF LOSSES

BY INCURRED LOSS SIZE GROUP

POLICY YEAR 1943

Size Group	No. of Cases	Incurred	Primary Amount	Average Cost	Excess Amount	Average Cost
0- 49	6 682	196 947	196 947	29		
50- 99	8 642	624 298	624 298	72		
100- 149	4 533	553 020	553 020	122		
150- 199	2 549	438 668	438 668	172		
200- 249	1 754	388 857	388 857	222		
250- 299	1 554	425 137	425 137	274		
300- 349	1 489	477 331	477 331	321		
350- 399	873	324 838	324 838	372		
400- 449	649	272 774	269 975	416	2 799	4
450- 499	426	200 101	193 690	455	6 411	15
500- 549	330	171 206	162 300	492	8 906	27
550- 599	278	158 694	146 480	527	12 214	44
600- 699	388	248 755	222 570	574	26 185	67
700- 799	269	200 511	171 200	636	29 311	109
800- 899	205	172 682	141 340	689	31 342	153
900- 999	138	129 729	101 700	737	28 029	203
1,000- 1,099	149	154 043	115 970	778	38 073	256
1,100- 1,199	86	97 743	70 660	822	27 083	315
1,200- 1,299	93	115 859	79 910	859	35 949	387
1,300- 1,399	86	114 999	76 570	890	38 429	447
1,400- 1,499	48	69 153	44 210	921	24 943	520
1,500- 1,599	79	119 923	74 540	944	45 383	574
1,600- 1,699	33	54 072	32 060	972	22 012	667
1,700- 1,799	72	125 170	71 690	996	53 480	743
1,800- 1,899	39	71 500	39 560	1 014	31 940	819
1,900- 1,999	39	75 737	40 270	1 033	35 467	909
2,000- 2,099	68	137 199	70 950	1 043	66 249	974

Appendage 5

PRIMARY-EXCESS

DISTRIBUTION OF LOSSES

BY INCURRED LOSS SIZE GROUP

POLICY YEAR 1943

Size Group	No. of Cases	Incurred	Primary Amount	Average Cost	Excess Amount	Average Cost
2,100- 2,199	33	70 461	35 080	1 063	35 381	1 072
2,200- 2,299	47	105 558	50 640	1 077	54 918	1 168
2,300- 2,399	28	65 451	30 440	1 087	35 011	1 250
2,400- 2,499	21	51 255	23 100	1 100	28 155	1 341
2,500- 2,999	136	366 767	152 370	1 120	214 397	1 576
3,000- 3,499	117	373 475	134 770	1 152	238 705	2 040
3,500- 3,999	93	341 584	109 000	1 172	232 584	2 501
4,000- 4,499	70	296 722	82 880	1 184	213 842	3 055
4,500- 4,999	52	243 779	61 880	1 190	181 899	3 498
5,000- 5,499	102	525 529	121 380	1 190	404 149	3 962
5,500- 5,999	38	215 243	45 470	1 197	169 773	4 468
6,000- 6,999	40	253 228	48 000	1 200	205 228	5 131
7,000- 7,999	29	214 028	34 800	1 200	179 228	6 180
8,000- 8,999	8	66 802	9 600	1 200	57 202	7 150
9,000- 9,999	5	46 981	6 000	1 200	40 981	8 196
10,000-19,999	12	153 315	14 400	1 200	138 915	11 576
20,000-29,999	2	51 065	2 400	1 200	48 665	24 333
40,000-49,999	1	47 805	1 200	1 200	46 605	46 605
Total	32 385	9 607 994	6 518 151	201	3 089 843	717

Appendage 6

Example showing in tabular form the calculation of the effect on primary and excess losses produced by a law amendment increasing the indemnity losses 15.5% for the Massachusetts temporary total compensable disability.
(15.5% increase in indemnity amounts to 10.0% overall - Indem. & Med.)

Loss Size Group (1)	No. of Cases (2)	Incurred Average Loss (3)	New Average 1.10 (3) (4)	Average Primary Values Col.(3) (5)	Average Primary Values Col.(4) (6)	Original Law (2) x (5) (7)	Amended Law (2) x (6) (8)
0- 399	117 726	-	-	Actual	Actual	$13 391 681	$14 730 849
400- 499	3 211	$ 442	$ 486	$ 430	$ 470	1 380 730	1 509 170
500- 599	1 851	544	598	510	550	944 010	1 018 050
600- 699	1 235	643	707	570	610	703 950	753 350
700- 799	830	747	822	640	680	531 200	564 400
800- 899	676	845	930	690	730	466 440	493 480
900- 999	470	948	1 043	740	780	347 800	366 600
1000 1099	386	1 034	1 137	780	820	301 080	316 520
1100-1199	268	1 143	1 257	820	860	219 760	230 480
1200 1299	223	1 247	1 372	860	900	191 780	200 700
1300-1399	202	1 350	1 485	890	930	179 780	187 860
1400-1499	147	1 451	1 596	920	960	135 240	141 120
1500-1599	161	1 532	1 685	950	980	152 950	157 780
1600 1699	98	1 644	1 808	970	1 010	95 060	98 980
1700-1799	111	1 742	1 916	990	1 030	109 890	114 330
1800-1899	67	1 839	2 023	1 010	1 050	67 670	70 350
1900-1999	65	1 938	2 132	1 030	1 060	66 950	68 900
2000-2099	86	2 027	2 230	1 050	1 070	90 300	92 020
2100-2199	55	2 148	2 363	1 060	1 090	58 300	59 950
2200 2299	59	2 244	2 468	1 080	1 100	63 720	64 900
2300-2399	49	2 341	2 575	1 090	1 110	53 410	54 390
2400-2499	37	2 448	2 693	1 100	1 120	40 700	41 440
2500-2999	162	2 714	2 985	1 120	1 140	181 440	184 680
3000-3499	124	3 184	3 502	1 150	1 170	142 600	145 080
3500-3999	78	3 695	4 065	1 170	1 180	91 260	92 040
4000 4499	41	4 166	4 583	1 180	1 190	48 380	48 790
4500-4999	34	4 686	5 155	1 190	1 190	40 460	40 460
5000-5452	38	5 140	5 654	1 190	1 200	45 220	45 600
5453 & Over	62	6 630	7 293	1 200	1 200	74 400	74 400
Total	128 552					20 216 161	21 966 669

	Old Law (9)	Amended Law (10)	Increases (11)	Ratio (10)÷(9) (12)	% Distribution of (11) (13)	% Distribution of Col.(9) (14)	Law Increase Distribution (12)÷(14) (15)
Total	$23 258 270	$25 584 097	$2 325 827	1.10000	1.0000	1.0000	1.100
Primary	20 216 161	21 966 669	1 750 508	1.08659	.7526	.8692	1.250
Excess	3 042 109	3 617 428	575 319	1.18912	.2474	.1308	9.091

Appendage 7

MASSACHUSETTS COMPENSATION LAW AMENDMENT

Calculation of Primary and Excess Loss Amendment Factors

(1)	Total Losses Old Law (2)	Amendment Factors Indemnity (3)	Ratio Indemnity Total (4)	A Indemnity Plus Medical by Type (2)/(4) (5)	Amendment in Terms of Ind. & Med. by Type 1.+[(3)-1] x(4) (6)	Basic Ratio (from Chart) $\Delta Ap/\Delta A$ (7)	"D" Ratio (8)
Fatal	1 719 899	1.043 1.275 1.318	.952	1 807 000	1.041 1.262	.118 .035	.280 .280
P. T.	299 375	1.286	.802	373 000	1.229	.000	.080
Major	2 730 841	1.427	.784	3 483 000	1.335	.060	.361
Minor	785 463	1.380	.724	1 085 000	1.275	.674	.896
Temp.	6 577 726	1.278	.644	10 214 000	1.179	.738	.870
Medical	7 453 382	1.000	Non Comp.	2 604 686	-	-	-
Total	19 566 686	(1.207)	(.617)	19 566 686			.7286

(1)	Ap Primary Losses (5)x(8) (9)	Δ A Increase in Total Losses (5)x [(6)-1] (10)	Δ Ap Increase in Primary (7)x(10) (11)	Δ Ap/Ap Basic Ratio (11)/(9) (12)	Primary Amendment Factors Applied to Ap 1.+(12) (13)	Primary Amendment Factors Applied to A (13)x(8) (14)
Fatal	505 960	74 087 473 434 547 521	8 742 16 570 25 312	.050	1.050	.294
P. T.	29 840	85 417	0	0	1.000	.080
Major	1 257 363	1 166 805	70 008	.056	1.056	.381
Minor	972 160	298 375	201 105	.207	1.207	1.081
Temp.	8 886 180	1 828 306	1 349 290	.152	1.152	1.002
Non Comp. Medical	2 604 686	-	-	-	-	-
Total	14 256 189	3 926 424	1 645 715	.115	1.115	.8124

(1)	Ae Excess Losses (5)-(9) (15)	Δ Ae Increase in Excess Losses (10)-(11) (16)	Δ Ae/Ae Basic Ratio (16)/(15) (17)	Excess Amendment Factors Applied to Ae 1.+(17) (18)	Excess Amendment Factors Applied to A (18)x [1.-(8)] (19)
Fatal	1 301 040	522 209	.401	1.401	1.009
P. T.	343 160	85 417	.249	1.249	1.149
Major	2 225 637	1 096 797	.493	1.493	.954
Minor	112 840	97 270	.862	1.862	.194
Temp.	1 327 820	479 016	.361	1.361	.177
Non Comp. Medical	-	-	-	-	
Total	5 310 497	2 280 709	.429	1.429	.3878

Appendage 8

1946 MASSACHUSETTS COMPENSATION LAW AMENDMENT

Calculation of Primary and Excess Loss Amendment Factors

Type of Injury (1)	1942-43 Losses on 1945 Level (2)	1946 Amendment Factor (3)	Ratio Indemnity Total (4)	A Indemnity and Medical by Type (2)/(4) (5)	Amendment in Terms of Ind. & Med. by Type 1.+ [(3)-1.] x(4) (6)	Basic Ratio $\Delta A_p/\Delta A$ (7)	"D" Ratio (8)
Fatal	2 535 731	1.000	.963	2 633 000	1.000	-	.226
P. T.	335 552	1.086	.839	400 000	1.072	.000	.065
Major	4 600 766	1.274) 1.070)	.838	5 490 000	1.230) 1.059)	.033) .016)	.285) .285)
Minor	1 053 589	1.087	.784	1 344 000	1.068	.622	.848
Temp.	9 480 263	1.089	.698	13 582 000	1.062	.731	.850
Medical	7 736 092	1.000		Non Comp. 2 292 993	-	-	-
Total	25 741 993	1.099		25 741 993			.667

(1)	A_p Primary Losses (5)x(8) (9)	ΔA Increase in Total Losses (5)x[(6)-1.] (10)	ΔA_p Increase in Primary (7)x(10) (11)	$\Delta A_p/A_p$ Basic Ratio (11)/(9) (12)	Primary Amendment Factors Applied to A_p 1.+(12) (13)	Primary Amendment Factors Applied to A (13)x(8) (14)
Fatal	595 058	0	-	-	1.000	.226
P. T.	26 000	28 800	0	-	1.000	.065
Major	1 564 650	1 262 700) 323 910)	41 669) 5 182)	.030	1.030	.294
Minor	1 139 712	91 392	56 846	.050	1.050	.890
Temp.	11 544 700	842 084	615 563	.053	1.053	.895
Non Comp. Medical	2 292 993	-	-	-	-	-
Total	17 163 113	2 548 886	719 260	.042	1.042	.695

(1)	A_e Excess Losses (5)-(9) (15)	ΔA_e Increase in Excess Losses (10)-(11) (16)	$\Delta A_e/A_e$ Basic Ratio (16)/(15) (17)	Excess Amendment Factors Applied to A_e 1.+(17) (18)	Excess Amendment Factors Applied to A (18)x[1.-(8)] (19)
Fatal	2 037 942	-	-	1.000	.774
P. T.	374 000	28 800	.077	1.077	1.007
Major	3 925 350	1 539 759	.392	1.392	.995
Minor	204 288	34 546	.169	1.169	.178
Temp.	2 037 300	226 521	.111	1.111	.167
Non Comp. Medical	-	-	-	-	-
Total	8 578 880	1 829 626	.213	1.213	.404

Appendage 9

PRIMARY-EXCESS

DEVELOPMENT FACTORS

Loss Ratios Policy Years 1933-1942

Policy Year	First Report Total	Fourth Report Total
1933	51.6	53.8
1934	48.2	50.0
1935	47.6	49.1
1936	45.1	46.8
1937	46.0	47.9
1938	50.0	51.4
1939	49.9	50.1*
1940	49.4	50.0*
1941	47.9	49.1*
1942	47.6	50.1*
10 Year Average	48.3	49.8

Indicated 10 Year Development

$$\frac{49.8}{48.3} = 1.031$$

*Third Report

Development of Primary Losses

Policy Year	1st - 2nd		2nd - 3rd		1st - 3rd
1941	.998				
1940	.994		.997		
1939	.995		.999		
Average	.996	x	.998	=	.994

Appendage 9

PRIMARY-EXCESS

DEVELOPMENT AND LAW AMENDMENT FACTORS

Policy Years 1943-1944

MASSACHUSETTS TOTAL CLASSIFICATION EXPERIENCE SCHEDULE "Z"

Policy Year	Payroll	Premium	Losses	Primary Losses	Excess Losses
1943	2 346 455 996	21 407 628	10 934 733	7 844 539	3 090 194
1944	2 346 486 429	21 040 220	11 121 318	7 893 218	3 228 100
Total	4 692 942 425	42 447 848	22 056 051	15 737 757	6 318 294

TOTAL EXCLUDED EXPERIENCE (Standard Exclusions plus new catastrophe $ 25,000 case handling)

Policy Year	Payroll	Premium	Losses	Primary Losses	Excess Losses
1943	17 938 323	860 254	350 117	187 241	162 876
1944	16 010 319	766 304	268 363	164 493	103 870
Total	33 948 642	1 626 558	618 480	351 734	266 746

DEVELOPMENT FACTORS

	Losses	Primary Losses		Excess Losses
1943	10 584 616	7 657 298		2 927 318
1944	10 852 955	7 728 725		3 124 230
Total	21 437 571	15 386 023		(b) 6 051 548
Development Factor	1.031	.994		(a)÷(b) 1.125
	22 102 136	15 293 707	=	(a) 6 808 429

LAW AMENDMENT FACTORS

PRIMARY

Policy Year		Eff. 9-1-43		Eff. 11-1-45		Eff. 9-1-46		Portion Applicable to 1944		
1943		1.000	x	1.115	x	1.042			=	1.162
1944	Prior 11-1-45			1.115	x	1.042	x	.986	=	1.146
	After 11-1-45			1.000	x	1.042	x	.014	=	.015
										1.161

EXCESS

Policy Year		Eff. 9-1-43		Eff. 11-1-45		Eff. 9-1-46		Portion Applicable to 1944		
1943		1.016	x	1.429	x	1.213			=	1.761
1944	Prior 11-1-45			1.429	x	1.213	x	.986	=	1.709
	After 11-1-45			1.000	x	1.213	x	.014	=	.017
										1.726

COMBINED FACTORS

	PRIMARY					EXCESS				
Policy Year	Development		Law Amendment			Development		Law Amendment		
1943	.994	x	1.162	=	1.155	1.125	x	1.761	=	1.981
1944	.994	x	1.161	=	1.154	1.125	x	1.726	=	1.942

Appendage 9

PRIMARY-EXCESS

CONVERSION OF 1943-1944 LOSSES TO RATE LEVEL

Policy Year 1943

	PRIMARY			EXCESS		
	Losses	Combined Factor	Losses at Rate Level	Losses	Combined Factor	Losses at Rate Level
Manufacturing	4 820 894	1.155	5 568 133	1 659 035	1.981	3 286 548
Construction & Erection	539 330		622 926	335 620		664 863
Commercial & Clerical	1 009 647		1 166 142	358 781		710 745
Care, Custody	462 746		534 472	200 262		396 719
All Other	749 202		865 328	348 209		689 802
Stevedoring	75 479		87 178	25 411		50 339
Total	7 657 298		8 844 179	2 927 318		5 799 016

Policy Year 1944

	PRIMARY			EXCESS		
	Losses	Combined Factor	Losses at Rate Level	Losses	Combined Factor	Losses at Rate Level
Manufacturing	4 772 531	1.154	5 507 501	1 667 587	1.942	3 238 454
Construction & Erection	601 919		694 615	418 300		812 339
Commercial & Clerical	1 023 716		1 181 368	390 277		757 918
Care, Custody	534 525		616 842	205 986		400 025
All Other	741 249		855 401	404 428		785 399
Stevedoring	54 785		63 222	37 652		73 120
Total	7 728 725		8 918 949	3 124 230		6 067 255

Appendage 9

PRIMARY-EXCESS

CONVERSION OF 1943-1944 LOSSES TO RATE LEVEL

Policy Years 1943-1944

	PRIMARY		EXCESS	
	(1) Losses	(2) Losses at Rate Level	(3) Losses	(4) Losses at Rate Level
Manufacturing	9 593 425	11 075 634	3 326 622	6 525 002
Construction & Erection	1 141 249	1 317 541	753 920	1 477 202
Commercial & Clerical	2 033 363	2 347 510	749 058	1 468 663
Care, Custody	997 271	1 151 314	406 248	796 744
All Other	1 490 451	1 720 729	752 637	1 475 201
Stevedoring	130 264	150 400	63 063	123 459
Total	15 386 023	17 763 128	6 051 548	11 866 271

TOTAL

	(5) Losses (1)+(3)	(6) Losses at Rate Level (2)+(4)	(7) Combined Factor (6)÷(5)
Manufacturing	12 920 047	17 600 636	1.362
Construction & Erection	1 895 169	2 794 743	1.475
Commercial & Clerical	2 782 421	3 816 173	1.372
Care, Custody	1 403 519	1 948 058	1.388
All Other	2 243 088	3 195 930	1.425
Stevedoring	193 327	273 859	1.417
Total	21 437 571	29 629 399	1.382

Appendage 9

PRIMARY-EXCESS

RATE LEVEL INDEX NUMBERS

Policy Years 1943-1944

		PRIMARY		EXCESS		TOTAL	
	Payroll	Losses (Actual ÷ Expected)	1943-44 Index Nos.*	Losses (Actual ÷ Expected)	1943-44 Index Nos.*	Losses (Actual ÷ Expected)	1943-44 Index Nos.*
Manufacturing	2 511 526 451	11 075 634 / 11 829 968	.936	6 525 002 / 3 596 785	1.814	17 600 636 / 15 426 753	1.141
Construction & Erection	140 811 689	1 317 541 / 1 905 793	.691	1 477 202 / 1 104 540	1.337	2 794 743 / 3 010 333	.928
Commercial & Clerical	1 478 725 980	2 347 510 / 2 652 018	.885	1 468 663 / 951 036	1.544	3 816 173 / 3 603 054	1.059
Care, Custody	234 900 023	1 151 314 / 1 361 787	.845	796 744 / 490 331	1.625	1 948 058 / 1 852 118	1.052
All Other	264 925 000	1 720 729 / 1 938 250	.888	1 475 201 / 799 616	1.845	3 195 930 / 2 737 866	1.167
Stevedoring	28 314 114	150 400 / 273 709	.549	123 459 / 131 192	.941	273 859 / 404 901	.676
Total	4 659 203 257	17 763 128 / 19 961 525	.890	11 866 271 / 7 073 500	1.678	29 629 399 / 27 035 025	1.096

*8-31-46 rate index numbers = 1.000

Appendage 9

PRIMARY-EXCESS

CALCULATION OF RATE LEVEL FACTORS

Policy Year 1942

		PRIMARY				EXCESS			
	(1) Payroll	(2) Losses (Actual ÷ Expected)	(3) Index Nos.	(4) 43-44 Index Nos.	(5) Rate Level Factor (4)÷(3)	(6) Losses (Actual ÷ Expected)	(7) Index Nos.	(8) 43-44 Index Nos.	(9) Rate Level Factor (8)÷(7)
Manufacturing	1 207 259 746	4 529 075 / 5 625 016	.805	.936	1.163	1 457 122 / 1 715 149	.850	1.814	2.134
Construction and Erection	83 536 526	731 251 / 1 264 478	.578	.691	1.196	524 652 / 726 978	.722	1.337	1.852
Commercial and Clerical	650 741 273	919 967 / 1 124 381	.818	.885	1.082	373 655 / 410 264	.911	1.544	1.695
Care, Custody	86 955 427	423 140 / 511 222	.828	.845	1.021	173 549 / 187 147	.927	1.625	1.753
All Other	115 051 312	711 537 / 877 225	.811	.888	1.095	348 019 / 367 408	.947	1.845	1.948
Stevedoring	7 780 985	48 107 / 75 351	.638	.549	.861	17 230 / 35 936	.479	.941	1.965
Total	2 151 325 269	7 363 077 / 9 477 673	.777	.890	1.145	2 894 227 / 3 442 882	.841	1.678	1.995

Appendage 9

PRIMARY-EXCESS

CALCULATION OF RATE LEVEL FACTORS

Policy Year 1941

		PRIMARY				EXCESS			
	(1) Payroll	(2) Losses (Actual ÷ Expected)	(3) Index Nos.	(4) 43-44 Index Nos.	(5) Rate Level Factor (4)÷(3)	(6) Losses (Actual ÷ Expected)	(7) Index Nos.	(8) 43-44 Index Nos.	(9) Rate Level Factor (8)÷(7)
Manufacturing	930 971 017	3 787 892 / 4 449 416	.851	.936	1.100	1 094 476 / 1 355 575	.807	1.814	2.248
Construction and Erection	89 695 824	942 285 / 1 351 906	.697	.691	.991	584 514 / 785 428	.744	1.337	1.797
Commercial and Clerical	608 176 020	926 878 / 1 089 655	.851	.885	1.040	350 210 / 396 512	.883	1.544	1.749
Care, Custody	76 746 842	384 424 / 454 788	.845	.845	1.000	99 373 / 166 705	.596	1.625	2.727
All Other	101 286 147	618 003 / 770 004	.803	.888	1.106	300 054 / 329 414	.911	1.845	2.025
Stevedoring	5 378 117	36 885 / 49 124	.751	.549	.731	11 286 / 23 644	.477	.941	1.973
Total	1 812 253 967	6 696 367 / 8 164 893	.820	.890	1.085	2 439 913 / 3 057 278	.798	1.678	2.103

Appendage 9

PRIMARY-EXCESS

CALCULATION OF RATE LEVEL FACTORS

Policy Year 1940

	PRIMARY					EXCESS			
	(1) Payroll	(2) Losses (Actual ÷ Expected)	(3) Index Nos.	(4) 43-44 Index Nos.	(5) Rate Level Factor (4)÷(3)	(6) Losses (Actual ÷ Expected)	(7) Index Nos.	(8) 43-44 Index Nos.	(9) Rate Level Factor (8)÷(7)
Manufacturing	657 782 429	2 608 173 / 3 158 932	.826	.936	1.133	738 835 / 966 812	.764	1.814	2.374
Construction and Erection	76 505 377	898 082 / 1 131 199	.794	.691	.870	505 531 / 635 018	.796	1.337	1.680
Commercial and Clerical	547 364 057	885 669 / 948 558	.934	.885	.948	317 793 / 346 814	.916	1.544	1.686
Care, Custody	69 514 378	368 055 / 412 514	.892	.845	.947	143 593 / 151 973	.945	1.625	1.720
All Other	84 170 876	532 227 / 607 770	.876	.888	1.014	333 962 / 268 794	1.242	1.845	1.486
Stevedoring	5 122 708	42 987 / 46 402	.926	.549	.593	14 233 / 22 088	.644	.941	1.461
Total	1 440 459 825	5 335 193 / 6 305 375	.846	.890	1.052	2 053 947 / 2 391 499	.859	1.678	1.953

Appendage 9

PRIMARY-EXCESS

CALCULATION OF RATE LEVEL FACTORS

Policy Year 1939

	(1) Payroll	PRIMARY (2) Losses (Actual ÷ Expected)	(3) Index Nos.	(4) 43-44 Index Nos.	(5) Rate Level Factor (4)÷(3)	EXCESS (6) Losses (Actual ÷ Expected)	(7) Index Nos.	(8) 43-44 Index Nos.	(9) Rate Level Factor (8)÷(7)
Manufacturing	544 338 281	2 244 200 / 2 615 948	.858	.936	1.091	784 018 / 797 759	.983	1.814	1.845
Construction and Erection	53 289 511	765 959 / 775 203	.988	.691	.699	466 391 / 447 594	1.042	1.337	1.283
Commercial and Clerical	510 968 489	829 159 / 876 385	.946	.885	.936	224 617 / 321 572	.698	1.544	2.212
Care, Custody	67 518 367	350 634 / 398 676	.879	.845	.961	120 678 / 147 568	.818	1.625	1.987
All Other	79 498 900	508 466 / 553 596	.918	.888	.967	213 169 / 246 258	.866	1.845	2.130
Stevedoring	4 627 849	36 651 / 42 010	.872	.549	.630	11 465 / 19 998	.573	.941	1.642
Total	1 260 241 397	4 735 069 / 5 261 818	.900	.890	.989	1 820 338 / 1 980 749	.919	1.678	1.826

Appendage 9

PRIMARY-EXCESS

CALCULATION OF RATE LEVEL FACTORS

Policy Years 1935-1938

TOTAL

	(1) Payroll	(2) Losses (Actual ÷ Expected)	(3) Index Nos.	(4) 1943-44 Index Nos.	(5) Rate Level Factor (4)÷(3)
Manufacturing	1 989 495 262	11 935 285 / 12 355 606	.966	1.141	1.181
Construction & Erection	193 577 421	4 947 002 / 4 464 600	1.108	.928	.838
Commercial & Clerical	1 847 044 879	4 364 090 / 4 169 094	1.047	1.059	1.011
Care, Custody	246 557 354	1 840 653 / 1 988 253	.926	1.052	1.136
All Other	294 955 806	2 963 550 / 2 890 775	1.025	1.167	1.139
Stevedoring	15 432 595	245 689 / 208 804	1.177	.676	.574
Total	4 587 063 317	26 296 269 / 26 077 132	1.008	1.096	1.087

THE NEW ERA OF CASUALTY RATE REGULATION*

by

JAMES B. DONOVAN

Legal developments within the past four years have marked the period as one of unprecedented significance with respect to governmental supervision of the casualty insurance industry. As we enter upon a new era of state regulation, a study of the events which created that era may broaden our comprehension of the unique experiment in political science to which the immediate future of the industry is bound. Such a review should be of especial interest to actuaries, for in the foreground of this historic development have been the rates which are primarily the responsibility of those trained in the actuarial sciences.

I

THE DECISION OF THE SUPREME COURT

On June 5, 1944 in *United States v. South Eastern Underwriters Ass. et al.*[1] the Supreme Court of the United States by a 4-3 decision determined for the first time that (a) a fire insurance company conducting a substantial part of its business across state lines is engaged in "commerce among the several States" and subject to regulation by Congress under the Commerce Clause of the Constitution and (b) the Sherman Antitrust Act is applicable to the business of insurance.

For seventy-five years previously the Court had consistently held that the Commerce Clause did not deprive the individual states of power to regulate and tax specific activities of foreign insurance companies which sold policies within their territories[2].

* This paper presented by invitation.

1. 322 U.S. 533, 64 Sup. Ct. 1162, 88 L. ed. 1440 (1944) noted in 44 Col. L. Rev. 772 (1944) and the subject of Powell, "Insurance as Commerce" (1944) 57 Harv. L. Rev. 937.
2. First held in *Paul v. Virginia*, 8 Wall. 168 (1868). Subsequent cases are collected in Gavit, the Commerce Clause of the United States Constitution (1932) pp. 134-139. See also 322 U.S. 533, 544, 567. The precise question of whether Congress has the power under the Commerce Clause to regulate interstate insurance transactions had never been submitted to the Court.

In the course of these decisions the Court had stated that "issuing a policy of insurance is not a transaction of commerce",[3] "the business of insurance is not commerce",[4] and "contracts of insurance are not commerce at all, neither state nor interstate".[5] On such decisions, and an assumption of consequent lack of Federal power, was founded the system of insurance regulation by the several states.

In the S.E.U.A. case Mr. Justice Black, speaking for a majority of the seven justices who participated,[6] analyzed these authorities. He pointed out that certain activities of a business may be intrastate and therefore subject to state control, while other activities of the same business may be interstate and therefore subject to Federal regulation. He observed that there is a wide range of business and other activities which, though subject to Federal regulation, are so intimately related to local welfare that, in the absence of Congressional action, they may be regulated or taxed by the states. The primary test applied by the Court to such activities, the Justice said, is not the mechanical one of whether the particular activity affected by the state regulation is part of interstate commerce, but rather whether, in each case, the competing demands of the state and national interests involved can be accommodated. Reviewing the varied activities which had been held by the Court to be interstate commerce, he concluded:[7]

> "No commercial enterprise of any kind which conducts its activities across state lines has been held to be wholly beyond the regulatory power of Congress under the Commerce Clause. We cannot make an exception of the business of insurance."

The majority of the Justices next held that the comprehensive language of the Sherman Act embraced the business of insurance and that there existed no evidence of a contrary Congressional intent. If exceptions are to be written into the Act, "they must come from the Congress, not this Court."[8] The argument that the Sherman Act necessarily invalidated many state laws regulating insurance was dismissed as "exaggerated."[9] The majority accordingly held that a conspiracy to restrain interstate trade and commerce by fixing and maintaining arbitrary and non-competitive premium rates on fire and allied lines of insurance in six states, and a conspiracy to monopolize

3. *Paul vs. Virginia*, 8 Wall. 168, 183 (1868).
4. *Hooper v. California*, 155 U.S. 648, 655 (1895).
5. *N.Y. Life Ins. Co. v. Deer Lodge County*, 231 U.S. 495, 510 (1913).
6. Mr. Justice Roberts and Mr. Justice Reed took no part in the consideration or decision of the case. 322 U.S. 533, 562.
7. 322 U.S. 533, 553.
8. Id. at 561.
9. Id. at 562.

such interstate trade and commerce, are violations of the Sherman Act. The decision of the District Court for the Northern District of Georgia,[10] which had dismissed the indictment as insufficient in law was reversed.

Three Justices dissented. In a lengthy opinion the late Chief Justice Stone discussed what he believed to be the two questions presented: (a) whether the business of entering into contracts in one state, insuring against the risk of loss by fire of property in others, is itself interstate commerce, and (b) whether an agreement or conspiracy to fix the premium rates of such contracts and in other ways to restrict competition in effecting policies of fire insurance, violates the Sherman Act.

The Chief Justice declared:[11]

> "The court below has answered no' to both of these questions. I think that its answer is right and its judgment should be affirmed, both on principle and in view of the permanency which should be given to the construction of the commerce clause and the Sherman Act in this respect, which has until now been consistently adhered to by all branches of the Government."

Mr. Justice Frankfurter joined in the opinion of the Chief Justice in a brief separate dissent. He held that the relations of the insurance business to national commerce and finance undoubtedly afford constitutional authority for appropriate regulation by Congress of the business of insurance, "certainly not to a less extent than Congressional regulation touching agriculture."[12] But

10. 51F. Supp. 712 (1943). The case went to the Supreme Court on direct appeal under the Criminal Appeals Act. 56 Stat. 271, 18 U.S.C. 682, amending 34 Stat. 1246.

11. 322 U.S. at 563. The majority did not agree with the Chief Justice that the first of these questions was presented by the decision of the District Judge, whose construction of the indictment was binding on such an appeal under the Criminal Appeals Act. Their belief was that the District Court had held the indictment bad for the sole reason that the entire "business of insurance" (not merely the part of the business in which contracts are physically executed) can never under any possible circumstances be "commerce". Id. at 537. See Note (1944) 44 Col. L. Rev. 772, 773.

12. Id. at 583. This belief that the modern business of insurance is not commerce but yet is subject to Congressional power under the Commerce Clause, was shared by the Chief Justice. Id. at 562, 563. It divided the Court, in reasoning but not result, in another case decided in the same term, *Polish Alliance v. N.L.R.B.*, 322 U.S. 643, 64 Sup. Ct. 1196, 88 L. ed. 1509 (1944).

he believed that the Sherman Act had never been intended to apply to insurance transactions such as those charged by the indictment and could find "no Congressional warrant" for causing the "far-reaching dislocations" referred to by the Chief Justice and Mr. Justice Jackson.

In a separate dissent Mr. Justice Jackson addressed himself to what he termed the "practical and ultimate choice" that faced the Court: "to say either that insurance was subject to state regulation or that it was subject to no existing regulation at all."[13] He declared that while a modern insurance business as usually conducted is in fact commerce, in contemplation of law insurance had acquired an established doctrinal status not based on present-day facts. "For constitutional purposes a fiction has been established and long acted upon by the Court, the states, and the Congress, that insurance is not commerce."[14] He stated that the decision could have consequences upon tax liabilities, refunds, liabilities under state law to states or to individuals, and "even criminal liabilities." Because of these facts the Justice believed that while "abstract logic" might support the majority, "the common sense and wisdom of the situation seem opposed".[15] He concluded:[16]

> "To force the hand of Congress is no more the proper function of the judiciary than to tie the hands of Congress. To use my office, at a time like this, and with so little justification in necessity, to dislocate the functions and revenues of the states and to catapult Congress into immediate and undivided responsibility for supervision of the nation's insurance businesses is more than I can reconcile with my view of the function of this Court in our society."

While the Supreme Court thus reversed the District Court decision dismissing the indictment, the issues in the case were never actually tried, for reasons hereinafter set forth.

13. Id. at 585.

14. Id. at 588. 35 states, including New York, had filed briefs as *amici curiae* urging affirmance of the District Court decision sustaining the demurrer: 41 states later petitioned the Court for a rehearing (den., 323 U.S. 811).

15. Id. at 589.

16. Id. at 594, 595.

II

THE DECISION OF CONGRESS

The *S.E.U.A.* decision immediately became the subject of controversy. Although Attorney General Biddle issued a statement to the contrary,[17] many state officials and insurance executives feared that the foundations of state regulation and taxation had been shaken.[18] It was contended that the decision reversed a Supreme Court practice instituted by Marshall not to decide a constitutional question except by a majority of the full Court.[19] Others criticized the Department of Justice for proceeding in such a case under the criminal, rather than the civil, provisions of the Sherman Act. Some saw the decision as the welcome discarding of an unrealistic fiction. But of paramount importance was a pending struggle in Congress.

While the *S.E.U.A.* case was before the Court, there were introduced in both Houses of Congress companion bills to exempt the business of insurance from the Sherman and Clayton Antitrust Acts.[20] With

17. 90 Cong. Rec. Part 10, pp. A3359, A3360, June 23, 1944. See editorial, N.Y.L.J., June 13, 1944, p. 2270, col. 1. Mr. Biddle later announced that no further action under the anti-trust laws would be taken until Congress and the states had an opportunity to act. Joint Hearings on S. 1362, H.R. 3269 and H.R. 3270 before Subcommittees of Committees on the Judiciary, 78th Congr., 2nd Sess., Part 6, p. 639, June 23, 1944.

18. Senate Report No. 20, to accompany S. 340, Committee on the Judiciary, 79th Congr., 1st Sess., Jan. 24, 1945; cf. Congressional debates cited in footnote 22 *infra*. Not all insurance interests agreed with this view. See statement of Senator O'Mahoney, Joint Hearing before Subcommittees of Committees on the Judiciary, 78th Congr., 2nd Sess., on S. 1362, H.R. 3269, and H.R. 3270, Part 6 at p. 639, June 23, 1944. Newspaper editorial opinion is summarized in Note (1944) 44 Col. L. Rev. 772, 773 as "in general, violently opposed to the decision."

19. Article, Charles Warren, N. Y. Times, June 8, 1944, p. 16, Cols. 2, 3; *contra*, Note (1944) 44 Col. L. Rev. 772, 773; letters, Hinds and Fraenkel, N.Y. "Times", June 12, 1944, p. 18, col. 6. In "Insurance as Commerce" (1944) 57 Harv. L. Rev. 937, 938, the redoubtable Professor Powell commented: "What respect such minority assumption of reverse leadership should command from mere observers, though of necessity of minor consequence, is within the constitutional freedom of each observer. A gracious pursuer of the judicial course might pay the minority quartet a delicate compliment, too delicate perhaps for acid analysis, by emulating their courage and independence and thus viewing their views as they viewed those of their predecessors."

20. H.R. 3270, S. 1362, 78th Congr., 1st Sess., introduced respectively on September 20 and 21, 1943. See Note (1943) 32 Geo. L. J. 66.

opposition including the Department of Justice, the Attorney General of Missouri and Senator O'Mahoney (D., Wyo.), the bills were still being considered at joint public meetings of House and Senate Judiciary Subcommittees when the *S.E.U.A.* decision was rendered.[21] Further hearings were held and bills proposed by various interests. On January 18, 1945, Senators McCarran and Ferguson introduced a measure which, after prolonged debate and substantial amendment, passed both Houses and was approved by President Roosevelt on March 9, 1945.[22] The text of the statute (hereinafter referred to as the McCarran Act) is as follows:

> "*Sec. 1.* Congress hereby declares that the continued regulation and taxation by the several States of the business of insurance is in the public interest, and that silence on the part of the Congress shall not be construed to impose any barrier to the regulation of taxation of such business by the several States.
>
> *Sec. 2.* *(a)* The business of insurance, and every person engaged therein, shall be subject to the laws of the several States which relate to the regulation or taxation of such business.
>
> *(b)* No Act of Congress shall be construed to invalidate, impair, or supersede any law enacted by any State for the purpose of regulating the business of insurance, or which imposes a fee or tax upon such business, unless such Act specifically relates to the business of insurance: provided, That after January 1, 1948, the Act of July 2, 1890, as amended, known as the Sherman Act, and the Act of October 15,

21. Joint Hearings on S. 1362, H.R. 3269, and H.R. 3270 before Subcommittees of Committees on the Judiciary, 78th Congr., 1st and 2nd Sess., parts 1-6. The House passed the bill on June 22, 1944 by a vote of 283 to 54. The Senate Committee on the Judiciary favorably reported it on September 20, 1944 with a strong minority dissent. The bill died in the Senate without vote.

22. P.L. No. 15, 79th Congr., 1st Sess., Ch. 20, Secs. 1-5 (March 9, 1945); 59 Stat. 33,34, 15 U.S.C. Secs. 1011,1015. For legislative history see House Legislative Calendar, 79th Congr., 1st and 2nd Sessions, Committee on the Judiciary, Jan. 29, 1946, No. 22, p. 103. Congressional debate may be found in 91 Cong. Record 499-509 (Jan. 25, 1945), 1112-1122 (Feb. 14, 1945), 1470-1473 (Feb. 26, 1945) and 1548-1559 (Feb. 27, 1945). As introduced, the measure was based upon a draft by a legislative committee of the National Association of Insurance Commissioners. See 91 Cong. Rec. 504, Jan. 25, 1945.

1914, as amended known as the Clayton Act, and the Act of September 26, 1914, known as the Federal Trade Commission Act, as amended, shall be applicable to the business of insurance to the extent that such business is not regulated by State Law.

Sec. 3. (a) Until January 1, 1948, the Act of July 2, 1890 as amended, known as the Sherman Act, and the Act of October 15, 1914, as amended, known as the Clayton Act, and the Act of September 26, 1914, known as the Federal Trade Commission Act, as amended, and the Act of June 19, 1936, known as the Robinson-Patman Anti-discrimination Act, shall not apply to the business of insurance or to acts in the conduct thereof.

(b) Nothing contained in this Act shall render the said Sherman act inapplicable to any agreement to boycott, coerce, or intimidate, or act of boycott, coercion, or intimidation.

Sec. 4. Nothing contained in this Act shall be construed to affect in any manner the application to the business of insurance of the Act of July 5, 1935, as amended, known as the National Labor Relations Act, or the Act of June 25, 1938, as amended, known as the Fair Labor Standards Act of 1938, or the Act of June 5, 1920, known as the Merchant Marine Act, 1920.

Sec. 5. As usual in this Act, the term "State" includes the several States, Alaska, Hawaii, Puerto Rico, and the District of Columbia.

Sec. 6. If any provision of this Act, or the application of such provision to any person or circumstances, shall be held invalid, the remainder of the Act, and the application of such provision to persons or circumstances other than those as to which it is held invalid, shall not be affected."

In approving the McCarran Act, President Roosevelt issued a public statement in which he said:[23]

> "I have given my approval to S. 340, the insurance bill, which passed the Congress last week. This bill grants the insurance business a moratorium from the application of the antitrust laws and certain related statutes, except for agreements to boycott, coerce, or intimidate, or acts of boycott, coercison or intimidation until January 1, 1948.
>
> The purpose of this moratorium period is to permit the States to makes necessary readjustments in their laws with respect insurance in order to bring them them into conformity with the decision of the Supreme Court in the South-Eastern Underwriters Association case. After the moratorium period, the antitrust laws and certain related statutes will be applicable in full force and effect to the business of insurance except to the extent that the states have assumed the responsibility, and are effectively performing that responsibility, for the regulation of whatever aspect of the insurance business may be involved. It is clear from the legislative history and the language of this act, that the Congress intended no grant of immunity for monopoly of for boycott, coerion or intimidation. Congress did not intend to permit private rate fixing, which the Anti trust Act forbids, but was willing to permit actual regulation of rates by affirmative action of the States.
>
> The bill is eminently fair to the States. It provides an opportunity for the orderly correction of abuses which have existed in the insurance business and perserves the right of the States to regulate in a manner consonant with the Supreme Court's interpretation of the antitrust laws."

23. White House Press Release, Mar. 10, 1945; "National Underwriter" Mar. 15, 1945, p. 4, col. 1; reprinted in part, N.Y. Times, March 11, 1945, Sec. 5, p. 45, col. 5; never officially reported. (The text is inaccurately reprinted in various journals and texts, in each of which there are omitted from the fourth sentence the words, "and are effectively performing that responsibility"). The President had previously emphasized "affirmative" State regulation in a letter to Senator Radcliffe before the McCarran Act was passed. 91 Cong. Rec., Jan. 25, 1945 at 503.

Shortly after the enactment of the McCarran Act, the Government discontinued the *S.E.U.A.* prosecution in the Northern District of Georgia.

The moratorium period in the Act, originally to end January 1, 1948, subsequently has been extended to June 30, 1948 by Congress on its own initiative.[24] The extension was stated by the Senate Judiciary Committee to be desirable "in order to provide the Congress an additional time to examine into the situation more completley than it has been able to do during the present session."[25]

Since the enactment of the McCarran Act, certain of the problems created by the *S.E.U.A.* decision have been the subject of judicial review. Foremost are two decisions of the Supreme Court of the United States.

In *Prudential Ins. Co. v. Benjamin,*[26] the insurance company protested an annual tax levied by South Carolina on foreign insurers (but not on domestic companies) as a condition of being authorized to do business within the State. The tax amounts to three per cent of the aggregate of premiums received from business done in South Carolina, regardless of its interstate or local character. Citing the *S.E.U.A.* decision, the insurer contended that the tax was an unconstitutional discrimination against interstate commerce in favor of local business. The Court unanimously upheld the tax.[27]

Mr. Justice Rutledge traced the winding paths of the previous decisions, commenting that "the history of the commerce clause has been one of very considerable judicial oscillation.[28] The authorities cited by *Prudential* were distinguished on the ground that in none of them had Congress acted or purported to act, either by way of consenting to the state's tax or otherwise. The court stated:[29]

> "None of the decisions conceded, because none involved any question of, the power of Congress to make conclusive its own mandate concerning what is commerce. But apart from that function of defining the outer boundary of its power, whenever Congress' judgment has been uttered affirmatively to contradict the Court's previously expressed view that specific action taken by the states in Congress' silence was forbidden by the commerce clause, this body has accommodated its previous judgment to Congress' expressed approval."

24. P.L. No. 238, 80th Cong., 1st Sess., ch. 326 (July 25, 1947).
25. Sen. Rep. No. 407, 80th Cong., 1st Sess. 419 (1947).
26. 328 U.S. 408, 66 Sup. Ct. 1142, 90 L. ed. 1342, 164 A.L.R. 476 (1946).
27. Mr. Justice Black concurred in the result and Mr. Justice Jackson took no part in the consideration or decision of the case.
28. 328 U.S. at 420.
29. Id. at 424, 425.

Since there was no contention by *Prudential* that commerce was not involved, the Court would give effect to the positive expression by the McCarran Act that the "continued regulation and taxation by the several States of the business of insurance" is in accord with Congress' policy. The court thus rejected the argument of *Prudential* that the commerce clause "of its own force", and without reference to any action by Congress, forbids discriminatory state taxation of interstate commerce.

Reviewing the McCarran Act, the Court found that it was the intention of Congress to "put the full weight of its power behind existing and future state legislation to sustain it from any attack under the Commerce clause to whatever extent this may be done with the force of that power behind it, subject only to the exceptions expressly provided for."[30]

> "Two conclusions, corollary in character and important for this case, must be drawn from Congress' action and the circumstances in which it was taken. One is that Congress intended to declare, and in effect declared, that uniformity of regulation, and of state taxation, are not required in reference to the business of insurance by the national public interest except in the specific respects otherwise expressly provided for. This necessarily was a determination by Congress that state taxes, which in its silence might be held invalid as discriminatory, do not place on interstate insurance business a burden which it is unable generally to bear or should not bear in the competition with local business. Such taxes were not uncommon among the states, and the statute clearly included South Carolina's tax now in issue.
>
> "That judgment was one of policy and reflected long and clear experience. For, notwithstanding the long incident of the tax and its payment by Prudential without question prior to the *South-Eastern* decision, the record of Prudential's continuous success in South Carolina over decades refutes any idea that payment of the tax handicapped it in any way tending to exclude it from competition with local business or with domestic insurance companies."

South Carolina and Congress had acted in complete coordination to sustain the tax, the Court declared, and it is therefore "reinforced by the exercise of all the power of government residing

30. Id. at pp. 431, 432.

in our scheme." The judgment of the Supreme Court of South Carolina, upholding the tax, accordingly was affirmed.[31]

In *Robertson v. California*[32] appellant had been convicted in California of the crimes of (a) soliciting and selling a policy of insurance without being licensed as required by law, and (b) acting without a license as an agent for a non-admitted insurer. The statutes violated[33] are part of California's comprehensive regulatory scheme for the business of insurance with the stated legislative objective "to protect the public by requiring and maintaining professional standards of conduct on the part of all insurance agents and insurance brokers acting as such within this State."[34]

The insurer in question was an Arizona corporation not licensed in California. Its business was transacted largely by radio advertising and use of the mails, in addition to the use of such agents as appellant. The evidence of non-compliance with the statutes was undisputed. Appellant's contention was, in effect, that since the entire series of acts done by him was directed to the conclusion of an interstate transaction (within the *S.E.U.A.* decision) those acts, though taking place altogether within California, were inseparably a part of an interstate transaction and therefore beyond reach of the state's licensing or regulatory power. California's refusal to license an Arizona insurer, for non-compliance with its requirement of certain reserves, was termed an unlawful exclusion of interstate commerce.

The Court rejected these contentions and sustained both statutes. The requirement of a license to act as an agent or broker was upheld as part of "a series of regulations designed and reasonably adapted to protect the public from fraud, misrepresentation, incompetence and sharp practice which falls short of minimum standards of decency in the selling of insurance by personal solicitation and salesmanship."[35] As to the State's refusing to admit insurers not conforming to reasonable standards, Mr. Justice Rutledge declared:[36]

> "The evils flowing from irresponsible insurers and insurance certainly are not less than those arising from the activities of irresponsible, incompetant

31. The Court expressly withheld any opinion concerning the validity of other types of State taxes. Id. at 431, note 40. The effect of the McCarran Act on various types of "discriminatory" state legislation is discussed in Note (1945) 45 Col. L. Rev. 927.

32. 328 U.S. 440, 66 Sup. Ct. 1160, 90 L. ed. 1366 (1946).

33. Deering's California Codes, Ins. Code of Calif., Secs. 703, 1642.

34. Id. Sec. 1639.

35. 328 U.S. at 447.

36. Id. at 457.

> or dishonest insurance agents. The two things are concomitant, being merely different facades of the same sepulchre for the investments and security of the public...It would be idle to require licensing of insurance agents, in order to secure honesty and competence, yet to place no restraint upon the kind of insurance to be sold or the kinds of companies allowed to sell it, and then to cover their representatives with their immunity. This could only result in placing domestic and complying foreign insurers at great disadvantage and eventually in nullifying all controls unless or until Congress should take over the regulation .
>
> No such consequence has followed for the *South-Eastern* decision. It didnot wipe out the experience of the states in the regulation of the business of insuranceor its effects for the continued validity of that regulation ****"

The Court pointed out that there was no showing that this particular insurer's business was unsound or fraudulent. It was merely that California has the right to exclude a company for non-compliance with reasonable standards, "until Congress makes contrary command."

The determination of the Court was made without specific reliance upon the McCarran Act, first because it was not believed to be necessary and second because the acts of appellant were committed after the *S.L.U.A.* decision but before the McCarran Act became law. To avoid "any semblance of retroactive effect in a criminal matter" the Court refrained from explicit reliance upon the act, although Mr. Justice Rutledge commented that it did not "detract from our decision on other grounds that the McCarran Act, if applied, would dictate the same result."[37]

Mr. Justice Douglas dissented in part. He agreed with the Court that California's general license requirements for insurance agents were constitutional, "even prior to the McCarran Act". He stated however:[38]

> "But prior to that Act California could not under our decisions under the commerce clause exclude an interstate business, at least in absence of a showing that it was a fraudulent enterprise or in an unsound condition. No such showing is made here.

37. Id. at 462.
38. Id.

> The McCarran Act changes that rule; but it should not be allowed to make unlawful what was lawful when done."

In concluding this review, it may not be without significance that in a recent case involving the transportation of natural gas in interstate commerce,[39] Mr. Justice Rutledge on behalf of the Supreme Court summarized the respective powers of the Federal and State governments under the Natural Gas Act as follows:

> "The Natural Gas Act therefore was not merely ineffective to exclude the sales now in question from state control. Rather both its policy and its terms confirm that control. More than 'silence' of Congress is involved. The declaration, though not identical in terms with the one made by the McCarran Act, 59 Stat. 33, 15 U.S.C. §1011, 15 U.S.C.A. §1011 et seq., concerning continued state regulation of the insurance business, is in effect equally clear, in view of the Act's historical setting, legislative history and objects, to show intention for the states to continue with regulation where Congress has not expressly taken over. Cf. Prudential Ins. Co. v. Benjamin, 328 U.S. 408, 66 S. Ct. 1142, 90 L. Ed. 1342, 164 A.L.R. 476. Congress has undoubted power to define the distribution of power over interstate commerce. Southern Pacific Co. v. State of Arizona, 325 U.S. 761, 769, 65 S. Ct. 1515, 1520, 89 L. Ed. 1915, and authorities cited; cf. Prudential Ins. Co. v. Benjamin, supra. Here the power has been exercised in a manner wholly inconsistent with exclusion of state authority over the sales in question.
>
> "Congress' action moreover was an unequivocal recognition of the vital interests of the states and their people, consumers and industry alike, in the regulation of rates and service. Indiana's interest in appellant's direct sales is obvious. That interest is certainly not less than the interest of California and her people in their portection against the evil effects of wholly unregulated sale of insurance interstate. Robertson v. People of State of California, 328 U.S. 440, 66 S. Ct. 1160, 90 L. Ed. 1366."

39. *Panhandle East, Pipe Line Co. v. Public Serv. Com'n,* - U.S. - , 68 Sup. Ct. 190 at 197, 92 L.ed. 173 at 181 (1947), not yet officially reported.

The S.E.U.A. decision and the McCarran Act have also been appraised by other courts in considering various phases of the insurance business. Apart from a decision in California that the state anti-trust statutes are now applicable,[40] the principal determination has been that under existing circumstances the rights of the states to regulate and to tax transaction of the business have not been altered.[41]

40. *Speegle v. Board of Fire Und.*, 29 C. (2d) 34, 172 P. (2d) 867 (1946).

41. *Ware v. Travelers Ins. Co.*, 150 F. (2d) 463 (C.C.A. 9th, 1945); *First National Benefit Soc. v. Garrison*, 58 F. Supp. 972, (S.D. Cal. 1945), aff'd. 155 F. (2d) 522 (C.C.A. 9th, 1946); *Glass v. Prudential Ins. Co.*, 246 Ala. 579, 22 So. (2d) 13 (1945); *State v. Prudential Ins. Co.*, 64 N.E. (2d) 150 (Ind., 1945, not officially reported) aff'd. 328 U.S. 823, 90 L.ed. 1603, 66 Sup. Ct. 1364 (1946); *In Re Insurance Tax Cases*, 160 Kan. 300, 161 P. (2d) 726, (1945) aff'd. 328 U.S. 822, 66 Sup. Ct. 1360, 90 L. ed. 1602 (1946); *Prudential Ins. Co. of America v. Barnett et. al.*, 27 So. (2d) 60 (Miss., 1946, not yet officially reported); *Keehn v. Hi-Grade Coal & Fuel Co.*, 23 N.J. Misc. 102, 41 A. (2d) 525 (1945); *Insurance Commissioner of Pennsylvania v. Griffiths*, 23 *N.J.* Misc. 96, 41A (2d) 386 (1945); *Keehn v. Laubach et at.*, 22 N.J. Misc. 380, 39A. (2d) 73 (1944) appeal dismissed 133 N.J.L. 227, 43A. (2d) 857 (1945); *Mendola v. Dineen 185* Misc. 540, 57 N.Y.S. (2d) 219 (1945); *Prudential Ins. Co. v. Murphy*, 207 S.C. 324, 35 S.E. (2d) 586 (1945), aff'd. 328 U.S. 408, 66 Sup. Ct. 1142, 90 L.ed. 1342 (1946); and cases cited therein.

III

THE DECISIONS OF THE STATES

When the McCarran Act became law on March 9, 1945, regulation of insurance by the several States varied from relatively complete supervision of all lines of insurance[42] to little or no regulation of many classes. Collaborative action believed essential in certain lines of insurance[43] could fall within the sweeping prohibitions of the Federal antitrust laws. But under the McCarran Act, after June 30, 1948, such laws (except as to boycott, coercion or intimidation) are applicable to the business of insurance only "to the extent that such business is not regulated by State law."[44] The measure of State regulation thus being the yardstick of immunity from Federal antitrust laws, the principal problem confronting State authorities and the industry has been to consider what new State controls should be formulated during the moratorium in order to preserve a system of regulation exclusively by States.[45]

We may briefly review these newly enacted laws as they affect casualty insurance, summarizing the legislation in effect on January 1, 1948. For simplification, legal citations are omitted; these are collected elsewhere[46] and may also be found in the

42. E.g., N.Y. Ins. Law, L. 1939, ch. 882, Consol. Laws, ch. 28, as amended.

43. E.g., the pooling of insurers' experience in most lines to obtain rates not excessive or inadequate. See Mowbray, "Insurance, Its Theory and Practice in the U.S." (N.Y. 1930), Chapter XIX.

44. McCarran Act, Sec. 2 (b); 15 U.S.C. 1012(b) Cf. *Parker v. Brown*, 317 U.S. 341 (1943), for similar result, in analogous situation, without such a statute. During debate on the McCarran Act Senator O'Mahoney (D. Wyo.) stated: "My whole point has always been that those combinations which the insurance industry desires to make should have a clearance from some authoritative spokesman of the public interest." 90 Cong. Rec. Part 5, p. 6627, June 23, 1944. See also statement of Attorney General Biddle in Joint Hearings on S. 1362, H.R. 3269 and H.R. 3270 before Subcommittees of Committees on the Judiciary, 78th Congr., 1st. and 2nd Sess., Part VI, pp. 637 *et seq*.

45. Desire for regulation by a Federal agency at the time was disavowed by the industry, the President, the Dept. of Justice, Senator O'Mahoney, etc. See Joint Hearings on S. 1362, H.R. 3269 and H.R. 3270 before Subcommittees of Committees on the Judiciary, 78th Congr., 1st and 2nd Sess., Parts 1-6, especially Part 6, pp. 637-640. In a letter to Senator Radcliffe, President Roosevelt stated that his administration was "not sponsoring Federal legislation to regulate insurance or to interfere with the continued regulation and taxation by the States of the business of insurance." 91 Cong. Rec. 503, Jan. 25, 1945.

46. Note (1947) 47 Col. L. Rev. 1314.

statutes of the individual states. The following summary applies to casualty lines other than workmen's compensation, the regulation of which has been traditional. Since the S.E.U.A. decision, the only new workmen's compensation rate regulation where none theretofore existed has been in Alaska, Connecticut, Hawaii, Illinois, Iowa, Montana, Nebraska, New Mexico and South Dakota. The present paper does not deal with accident and health insurance.

While seventeen states have enacted "fair trade practices" legislation specifically designed to effect an ouster of the Federal Trade Commission Act,[47] and three states have attempted to prevent application of the Clayton Act by regulating interlocking directorates and ownership,[48] these have not been the primary concern of the state legislatures. Most important has been legislation to render the Sherman Act inapplicable by the passage of rate regulatory laws. Such statutes have now become law in every state and territory except as follows: in Idaho, Rhode Island, Missouri, West Virginia, the District of Columbia and Puerto Rico, there are no laws specifically providing for regulation of casualty rates; in Virginia,[49] only automobile and fidelity and surety insurance rates are regulated and in Oklahoma[50] only automobile, glass insurance and employers liability. In all other states rating legislation of some type exists as of January 1, 1948.

In Louisiana[51] for all casualty lines and in Texas[52] for automobile insurance, a state commission literally makes the rates. In North Carolina[53] and Virginia,[54] there are other forms of regulation for automobile insurance, and in Massachusetts[55] a special form of regulation for certain statutory coverages. In most states, however, there has been enacted a system of regulation having the basic outline of the traditional New York statutes, with differences of varying practical importance. It was such a model regulatory statute that the National Association of Insurance Commissioners

47. Florida, Indiana, Maryland, Massachusetts, Michigan, Minnesota, Nebraska, New Hampshire, New Jersey, New Mexico, Pennsylvania, South Carolina, South Dakota, Tennessee, Utah, Washington and Wisconsin.
48. Connecticut, Illinois and Pennsylvania.
49. Sections 4326B1 to 4326B6 and Sec. 2154 Ins. Laws of Virginia.
50. Sec. 88 Oklahoma Ins. Laws; Opinion Atty. Gen., Feb. 27, 1928, on automobile liability insurance.
51. Sec. 4277.2-4277.3 La. Gen. Stats., Dart. Annotated 1939.
52. Art. 4268B, Sections 1 to 11a, Ins. Laws of Texas.
53. Sec. 58-246 to 58-248.6 of Article 25, Chap. 58, Ins. Laws of N. Car.
54. Sec. 4326B1 to 4326B6, and 2154, Ins. Laws of Va.
55. Chapter 175, Section 113B, Annotated Laws of Mass.

and an All-Industry Committee debated and agreed upon in 1946.

In broad outline, the statutes enacted provide that:

(1) rates must meet certain standards;

(2) rates must be filed with state supervisory officials, who are granted certain powers if the rates fail to meet the statutory standards;

(3) companies may combine in rating matters but only if their organizations for such purposes are licensed by the state.

Let us consider briefly each of these components of the rating laws.

1. *Rates must meet certain standards.*

The statutes normally provide that rates must not be "excessive, inadequate or unfairly discriminatory". Definitions of these terms are found in few of the state statutes[56] and the phrases await interpretation by the courts, which ordinarily should adopt the meanings customary in the business. In the State of Washington alone there are no statutory standards expressly applicable to casualty rates.[57]

The rates used should be made with due consideration to past and prospective loss experience, certain enumerated matters and "all other relevant factors within and outside the state."

2. *All rates must be filed with state supervisory officials, who are granted certain powers if the rates fail to meet the statutory standards.*

This is true in every state, except that in California no rate need be filed until required by the Commissioner in investigating alleged violations of law, and in Montana rates must be filed only when made by a rating organization.[58] With the rates must be filed all manuals of rules and all rating plans; in most states, these filings must be accompanied by supporting information only in the event that the state official does not have sufficient information to determine whether the filings meet the statutory standards.

56. E.g., Sec. 1852(a), Cal. Ins. Laws.

57. Sec. 19.03, Wash. Ins. Code.

58. Chapter 805, Calif. L. 1947; Sec. 11, ch. 255, Mont. L. 1947. Manual rates of course are readily available to a state Insurance Department, irrespective of a filing requirement.

Filings may be made by either an insurer or an authorized organization acting in its behalf.

In almost all states, the rates cannot be used for a certain number of days (called a "waiting period") and in the majority of states the Commissioner has power to prevent the use of rates by action before the end of the waiting period. In every state having a rate regulatory law the Commissioner at any time may examine into any existing rates and, while he may not set aside contracts already made, he may order the discontinuance of such rates in the future.

Procedures for the gathering and compilation of experience for the information of the Commissioner are uniformly provided in the laws.

3. *Companies may combine in rating matters but only if their organizations for such purposes are licensed and supervised by the state.*

This is true in all states which have enacted rate regulatory laws. Rating organizations, advisory organizations, and joint activities of such groups, are subjected to rigid scrutiny. In almost all states, membership in these concerted activities is not compulsory for any insurer. Rating organizations must permit any insurer to subscribe to their rating services and virtually all their actions are subject to appeal to the Commissioner by a member or subscriber. Deviations by a member or subscriber on a specified basis (usually a uniform percentage deviation) are sanctioned.

THE FUTURE

Reasonable men may differ in their views as to the probable success or failure of vesting in the several states such comprehensive powers over an interstate industry. What all may agree upon is that the system can succeed only if industry and government approach their respective responsibilities with an intelligent altruism.

ABSTRACT OF THE DISCUSSION OF PAPERS READ AT THE PREVIOUS MEETING

MECHANIZED UNIT REPORTING

H. T. BARBER
Volume XXXIII, Page 5
Written Discussion
R. P. GODDARD

The very title of this paper brings to some minds the thought of push-button statistics, of simply deciding upon what is wanted and "letting the machines do the work". Mr. Barber makes clear, though with due modesty he does not stress, the careful planning and continual vigilance which is required to maintain the 80-column accuracy which is a preriquisite for success in a large scale undertaking of this kind. The report indicates that the development of the mechanical process was facilitated by previous experience with the use of continuous forms in typing unit reports under the method previously employed. Every punch card is verified and carefully guarded while in transit from punching to tabulating, indicating that the personnel has had experience with the maintenance of accounting accuracy with alphabetic equipment. The ingenious use of special type-bars to translate coverage codes into symbols evokes admiration on its own account, but the final accomplishment is no mere trick, to be achieved by anybody merely by the use of special gadgets.

It is to be noted that in the mechanical process described no attempt is made to weave the preparation of unit reports into the regular fabric of accounting and loss reserve records. While this is theoretically possible, it amounts to somewhat of a tour de force for a large company and probably would not produce proportionate savings. In any event, it would not seem advisable for a company which is contemplating the mechanization of its unit reporting procedure to adopt complete mechanization at one plunge.

It goes without saying that a certain amount of adaptability is lost when a mechanical method of the type described is introduced. The fact that the Unit Statistical Plan has remained substantially unchanged over a long period of years, and the further fact that it is still performing a very useful function for both the insurance companies and the public, gives promise that it will not be abandoned or radically modified in the near future. One change which has been discussed would involve the summation of indemnity and medical for individual losses, and to this type of change a mechanical method would probably be more adaptable than the present hand methods.

Mr. Barber does not indicate the extent of the net saving in personnel, but we can assume for the sake of argument that it was not spectacular, since items not handled in one way must be handled in another, and key-punch operators, tabulators and supervisors are as difficult to obtain as experienced clerks. The principal value of the method lies not in any potential saving in expense, but in the increased efficiency of producing the unit reports themselves, and in the more immediate availability of classification experience for review by all departments of the company. The Society, and the compensation insurance industry generally, is indebted to Mr. Barber for this exposition of this pioneering feat.

N. M. VALERIUS

This is a most clear and concise report of a new method of compliance with a statistical requirement that lays on every carrier of workmen's compensation the burden of preparing a "unit report" or risk history, giving exposures, premiums, and losses in the year in each state as to each assured, to be sent to a central statistical bureau for rate-making purposes

At the outset, the author notes that, in the fifteen years since the papers by Mr. C. M. Graham and Mr. Kormes on the subject of compensation experience unit reporting, the Compensation Unit Statistical Plan has been altered only in relatively minor respects and has become universal in states using the Basic Compensation Manual. Those papers recorded in the *Proceedings* the recent institution of the Plan and reported procedures found effective in the first years of operation.

Mechanized unit reporting as developed and used by Mr. Barber's Company is the first important development in the Unit Plan field since that time. While it does not alter the Plan, as it is only a method of compiling the statistics required in the form required, except for some permutation of the items, it portends a completely mechanized Plan in time.

Mr. Graham's paper still describes essentially the method of compliance by most companies, a description distilled down quite remarkably by Mr. Barber to less than two pages as to his Company in the sub-section, "Unit Reports by Hand". That both of the earlier papers together with the discussions they evoked in the *Proceedings* are included in the "Recommendations for Study" indicates that the methods described are still considered current.

The mechanization of unit reporting has been made possible by developments in business machines, particularly two such, eighty column punch card equipment, and alphabetic punching and tabulating equipment. Eighty column equipment was available but not commonly installed when carriers began to prepare unit reports for rating organizations and as a source of internal statistics. Mr. Masterson had described the use of such equipment at the May 1930 meeting and made some quite perspicacious remarks in respect to it and the new-fledged Unit Plan, *Proceedings,* Vol. XVI, pp. 307-308.

Alphabetic punching and tabulating equipment was available about the same time but not taken up by insurance carriers until a good deal later.

It would seem that the evolution of the mechanized method of reporting in Mr. Barber's Company arose in part out of the previous method of compiling the reports and in part out of the ingenuity of some members of the staff, among whom he did not include himself. The previous method contributed in this way that the unit reports were being compiled from original sources and then in turn were becoming the source of the Company's own classification experience, via punch cards made from their data, and it was reasoned that a more economical procedure would be to punch first from original sources, then parallelly derive unit and classification experience.

Our office has followed a somewhat different procedure, which may in part explain the slower progress of evolution in its case; possibly also a less ingenious staff should be postulated. Our office had a well-developed risk history card system covering all compensation risks, when the Unit Plan came into being. One card called the registration card carried the items which in the mechanized procedure go on the Name punch Cards, and the Payroll and Premium punch Card, Kind 6, and the other, the incurred cost card, carried the items which in the mechanization go on Loss and Valuation punch Cards, Kinds 7 and 9. The registration card received original entries as a hectograph impression at the time the application was received in the Home Office and all later entries, as audits and endorsements, were made by hand. The incurred cost card was typed up at the time the first claim notice arrived to be listed thereon and was augmented and kept up to date by typed and hand entries as more claim notices or change-of-incurred notices or closed claim notices were received from the claim department.

These risk history cards were used for reviewing individual risk experience for underwriting purposes and, as policy abstracts and claim histories, served other purposes as well. As a consequence, compliance with the Unit Plan consisted essentially in transcribing this information to the required form, although of course there had to be instituted procedures of checking the completeness and accuracy of the reports, and of routing developments after the first report to the attention of the Unit Plan division, and individual claim reports where required had to be written up from the claim files. The Unit Plan was therefore rather readily assimilated into our way of doing things and we have perhaps given less thought to other ways of achieving the result that we might otherwise have.

There has been one change of some moment since the Unit Plan became a factor. Our classification experience was being derived independently of risk histories and Unit Reports, more or less as a by-product of accounting records. The near duplication of effort began to be evident as the unit Plan took in more territory and it was eventually concluded to expand the Unit Plan to all states for internal purposes and to punch the Home Office copies of the Unit Plan experience for the purpose of tabulating classification experience. This resulted in a considerable saving for the tabulating department in both personnel and machine time, because the volume of separate items to be handled is much reduced by the processing of original sources in making up the Unit Reports. The above developments and perhaps the lack of other developments were influenced in large degree by the situation that the statistical division did not happen at any time to be nearly as severely affected by the man-power shortage as our tabulating department.

It will be remembered that in mechanized unit reporting there is some handwork left in preparing claim reports and the mechanization does not extend to revised and second and later reports. There is an implication on page 15 also that not every bureau has accepted the result.

It is appreciated very much that Mr. Barber made the material of this paper available through the *Proceedings* and in such clarity of presentation. Any staff who might be considering such a system as this should be indeed grateful.

On page 12 at about the middle, the expression "claim cards" seems to be a typographical error for "name cards". The note with Figure 3 on page 19, "These have been prepared", etc., apparently pertains also to Figure 2 on page 18.

If all papers fare as well in the new economical format of the *Proceedings* as this first one, the change may not prove any great hardship.

MULTIPLE INJURY ACCIDENTS AND LOSSES IN EXCESS OF ANY SPECIFIED RETENTION: - PENNSYLVANIA WORKMEN'S COMPENSATION

GEORGE B. ELLIOTT
Volume XXXIII, Page 40
Written Discussion
CHARLES W. CROUSE

Pure premium rates for excess insurance are almost always very difficult to determine because losses of the classes covered by such insurance have occurred so infrequently in the past that it almost impossible to obtain a body of statistics upon the basis of which one can make reliable estimates of the probabilities of their occurrence in the future. Mr. Elliott, in the paper under discussion has presented a great body of statistical material relative to the occurrence of losses of one such class, to wit; the class of Pennsylvania Workmen's Compensation losses in excess of $10,000 in consequence of a single accident; and thereby he has justly earned the gratitude of everyone who ever has occasion to determine a premium rate for an insurance covering losses of that class. I will not concede, as Mr. Elliott does in the introduction of his paper, that the making of such rates is at present academic, for a considerable number of such insurances are at present being written or renewed and the proper determination of the premium to be charged for them is a matter of considerably more than academic interest to the underwriters thereof and the employers thereby assurred.

However, the value of the paper is not restricted to the problem of determining premium rates for excess insurances covering Pennsylvania Workmen's Compensation losses over $10,000. Anyone seeking statistical information - for whatever purpose - concerning the incidence of industrial accidents will find in the tables of the paper, an array of data on the incidence of accidents resulting in serious injuries or death of two or more workmen, the like of which is not readily to be found in any other article of American publication. For that reason, the paper will be read by persons of diverse callings; and therefore it is especially unfortunate that in the version which appears in the *Proceedings,* there are several irregularities in expression which are likely to confuse readers not thoroughly familiar with the computation of mathematical expectations of loss.*

There is a tacit assumption underlying the method of loss valuation employed in the paper, to which attention should be directed. For each accident which occurred in an operation other than Coal Mining and which caused a given set of one or more injuries (e. g. one permanent total, or five deaths and three major permanents), the value of loss in excess of $10,000 in consequence thereof, was taken to be the mathematical expectation of $10,000 under the present Pennsylvania scale of benefits in consequence of any accident causing a set of injuries similar to the given set in respect to the types of injuries, but without respect to the ages of the disabled or to the number and the ages of the dependents in fatal cases. The value of such expectation was computed on the basis of certain distributions of the claims arising out of

* The term "the amount of the probable excess over $10,000" which appears at the foot of page 43 should be interpreted to mean: The mathematical expectations of loss in excess of $10,000. The words: "the value of these probabilities is as follows", which precede the equations appearing at the foot of page 44, should be interpreted to mean: On the premise that a three-death accident has occurred, the mathematical expectation of loss in excess of $10,000 in consequence thereof, may be computed as follows. A similar remark applies with respect to the interpretation of the words "and their value is" which appear about the set of eleven equations on page 46.

insured Pennsylvania operations, not Coal Mining but otherwise irrespective of classification, in Policy Years 1939 through 1942. Such values were then used in the determination of pure premiums.

Now, the tacit assumption is that in any observation of the form "X deaths, Y permanent totals and Z major permanents were caused by one accident on a risk of class C and Size S", the numbers X,Y, and Z have more statistical significance in respect to the class C and the risk-size S than the numbers of the dependents actually involved in the X fatal cases, their actual ages and relationship, and the actual ages of the Y permanent totals. These later data are tacitly presumed to be so much subject to random fluctuation within any class of risks that a more reliable pure premium for that class will be obtained if the mathematical expectation of loss on account of X deaths, Y permanent totals and Z major permanents, calculated over *all* classes of risks (except Coal Mining), is used as the value of the loss corresponding to each observed event of the XYZ type, in place of values determined separately for each such event by taking into account the age and dependency situations actually found therein.

Now, I do not doubt that on practical grounds the use of this method of loss valuation was justified in the study reported by the paper under discussion; and I do not think that the results are any the less interesting or valuable than they would have been had some other method of valuation been employed. Moreover, I am aware that there is a sentence in the statute law of Pennsylvania* which in effect prohibits the use of the actual number of dependents in any particular fatal case in the valuation of that case for merit rating purposes, and I am aware that this sentence may have been thought to bear some implication concerning the making of rates for excess covers.

But the fact remains that the method of valuation which was used, rests *logically* upon the assumption to which I am inviting attention; and so far as I know, that assumption has not been statistically justified. The data relative to Pennsylvania losses of Policy Years 1939 through 1942 which are set forth in the paper, indicate that there is a significant difference between the frequency distribution of Coal Mining fatalities by type according to number and relationship of dependents, and the corresponding frequency distribution of fatalities arising out of operations other than Coal Mining; and that difference was recognized in the computation of pure premiums for Coal Mining risks. Similar significant differences may exist between classes of industries within the great class of all operations other than Coal Mining, e.g., between Manufacturing and Contracting. If such differences do exist, then it is hard to see how the aforesaid assumption *could* be statistically justified.

* Last sentence in first paragraph of Section 654 of "The Insurance Company law of 1921" as amended by Act of July 31, 1941, P.L. 607.

In the Conclusion of his paper, Mr. Elliott states that in his opinion "rates for excess coverage on a per-accident basis, which are expressed as a percentage of the manual rate, are not calculated on a sound actuarial basis". Now, I am almost certain that he does not mean this quite literally, for the mode of expressing a set of premium rates obviously has nothing to do with the soundness or unsoundness of the basis upon which they were calculated. I think he means that rates for such excess coverage of risks within any particular industrial category, calculated on the total experience of all risks of that category without distinction with respect to risk-size, ought not to be regarded as entirely reasonable or certainly adequate for those risks within that category for which such coverage will be purchased. With this opinion, I agree -- for, since excess covers are bought almost exclusively by Large Risks and since it is reasonable to expect that there are significant differences in respect to excess Loss experience between Large Risks and Small Risks *in the same industry,* such differences ought to be looked for and - if found - recognized in the making of rates for excess covers.

However, I do not think that the existence of *such* significant differences has been demonstrated in this paper. It is true, as Mr. Elliott points out, that the pure premium for excess losses on Large Manufacturing Risks, set forth in column (6) of Table I, is three times the pure premium for excess losses on Small Manufacturing Risks. But the pure premium for *all* losses on Large Manufacturing Risks, which is shown in column (5), is 1.31 times the pure premium for *all* losses on Small Manufacturing Risks. Now, in Pennsylvania Large Risks under full cover in almost any industry are - as a class - better than Small Risks under full cover in the *same* industry, just as they are in almost every other jurisdiction. In fact, the weighted mean of the deviations from manual rates determined by the Pennsylvania prospective experience rating procedure for Large Manufacturing Risks, is approximately -40%. Clearly the most probable explanation of the fact that the pure premium for all losses on Large Manufacturing Risks is *greater* than the corresponding pure premium for Small Manufacturing Risks, is to be found in the proposition that a relatively large part of the payroll for Large Risks was earned on very hazardous operations, whereas a relatively small part of the payroll for Small Risks was earned on such operations. But this proposition may also explain the fact that the pure premium for *excess* losses on Large Manufacturing *Risks* is greater than the pure premium for *excess* losses on Small Manufacturing Risks. Similar remarks with a few modifications could be made concerning risks in the categories labeled "Contracting and Quarrying" and "Other Industries."

In order to determine whether or not there is any significant difference in respect to excess losses per $100 of payroll between Large Risks and Small Risks in the *same* industry, that is to say, any such difference which is independent of the apparent correlation between risk-size and degree of inherent hazard, one would have first to classify the payrolls and losses by degree of hazard inherent in the physical operations on which they were incurred; then to compute the quotient of excess losses by payroll for each of at least two risk-sizes within each class by degree of hazard; and finally to apply to the resultant three dimensional point-set, the well established methods of multiple and partial correlation analysis

MARK KORMES

The problem of "excess" insurance ratemaking is one of great interest to me and I am, therefore, glad of the opportunity to offer several comments and remarks on the results of the Pennsylvania Study of Excess Costs which is the subject matter of Mr. Elliott's paper.

As Mr. Elliott states in the introduction, the methods used represent a statistical approach to the problem. It seems, therefore, proper to analyze somewhat the methods themselves before discussing the results of the study. I have little quarrel with the method of payroll modification; although, if better statistics for various industries were available, the results might be quite different by classification or even industry groups. I have, however, considerable doubts on the validity of the use of average loss values as used in the 1946 rate revision and assumption that such average values reflect a proper adjustment of losses to a current level. For losses in the minor and temporary classifications this method may produce satisfactory results because the large number of such cases in each and every year increases the likelihood that the distribution by extent of injury and wages will not vary materially from year to year. This can hardly be assumed for the more serious type of cases, especially deaths and permanent totals. With the trend toward smaller families and giving due consideration to the degree of abnormality of the distribution during war years, the cases of deaths without dependents will present a considerable variation during a period of fifteen years and it is quite possible that there may be found quite a definite trend in the change of distribution of such cases by industries and classifications. The cost of permanent total cases depends not only on the wage distribution but also on the age distribution of the working population. It is my opinion that some degree of refinement and possibly the evaluation of individual cases on basis of projected payrolls, together with adjustments for apparent trends, may constitute a better statistical approach and eliminate some of the objections to the use of average values.

I also have grave doubts as respects the validity of the calculation of mathematical expectation of the excess cost as calculated in this study. The various probabilities are combined as if the events were independent, which is an assumption yet to be proved. There, again, it would appear less objectionable to determine the excess cost on the basis of each actual occurrance after making such adjustment in the data as may be reasonable and adequate. In this respect the study made by the New York Compensation Rating Board (1) was definitely more satisfactory and less open to criticism. It might be proper at this point to call attention to the type-ographical error as respects the calculation of the mathematical expectation of the cost of a three-death accident where the value of the probabilities was left out.

Let us turn now to the conclusions drawn by Mr. Elliott from the results of the study.

Assuming that the differences which might have resulted from the application of more accurate methods as suggested above would not be very material, the paper brings out clearly the fact that certain types of industries have a much more pronounced tendency to produce catastrophies and the incident excess cost. In my opinion, the subdivision by industrial groups is highly unsatisfactory. Thus, for example, we have a wide variation of hazards in the manufacturing (excluding explosives) and the All Other Industry Groups. The small manufacturing risks include a very large number of small non-hazardous risks, such as clothing manufacturing; while the large risks include the heavy manufacturing industries with greater hazards and, therefore, greater likelihood of excess losses.

The difference in the results for small and large risks should have been more or less anticipated under this method of grouping. The grouping of classifications by inherent hazard, as was done in the New York study, would have produced an entirely different picture, and one, which would be more consistent with the expectation of the average underwriter.

I agree with Mr. Elliott and Mr. Crane that the rates for "excess" coverage should not be expressed as percentages of average manual rates as I have already said on a previous occasion (2). It must be remembered that a risk whose premium would be $10,000 or less is hardly a good prospect for self-insurance, and I am sure that few excess underwriters would care to place excess coverage on a self-insurer of such a small size. Again, the group of risks which are self-insured may present a different "excess" cost picture than the so-called large insured risks, I must reiterate what I have said in my discussion of Mr. Cahill's paper (2) that some type of experience rating will be necessary if this coverage should be made attractive and produce adequate results. In actual practice this is recognized by many "excess" insurers in the form of a

(1) See Mr. Cahill's paper Proceeding Vol. XXVII, p. 77.
(2) See written discussion of Mr. Cahill's paper, Proceeding Vol. XXVII, p. 363.

"contingent" profit-sharing provision in their contracts.

Perhaps a more scientific approach lies in the considerations contained in Mr. Carleton's paper dealing with non-random accident distribution (3).

In conclusion, I would like to express the hope that the various reinsurance companies will find a way of pooling their experience under such risks and present the results of their study for the benefit of the members of this Society and the insuring public in general.

ROGER A. JOHNSON JR.

Mr. Elliott's concise paper presents a novel approach to the subject of ratemaking for excess coverage.

The author's conclusion that "the cost in excess of $10,000 per accident under current Pennsylvania benefits is so small as to be almost negligible" may be true, but it certainly would not apply in New York, whose average values are roughly double those used by Mr. Elliott in his Pennsylvania study. An analysis of five years of New York losses made several years ago indicated that about 7½% of total losses are in excess of $10,000 per claim and about 8% in excess of $10,000 per accident. Under current conditions even higher percentages would probably apply. Furthermore, there are other states with higher benefit levels than Pennsylvania where the excess cost may be significant.

Rates for this type of coverage are needed in New York in view of the fact that the Chairman of the Workmen's Compensation Board has promulgated new rules relative to the privilege of self-insurance and as a part of those rules has required that all self insurers make provision for catastrophe losses *either* by depositing additional security *or* by filing proof of excess coverage on a standard form of policy with specified limits written by a carrier licensed to do an excess or reinsurance business in the State of New York. Since the Superintendent of Insurance has ruled that such coverage is in the nature of reinsurance and as such the rates are not subject to his approval, the Compensation Insurance Rating Board has published "advisory" rates for the guidance of its members in writing this coverage.

It is Mr. Elliott's opinion "that rates for excess coverage on a per-accident basis, which are expressed as a percentage of the manual rate, are not calculated on a sound actuarial basis, in view of the well-defined differences between 'large' and 'small' risks." Since, in Pennsylvania, manual rates are made excluding the experience of large ($10,000 or over) and minimum premium risks, it is logical for him to carry this theory over into a study of this nature.

(3) Volume XXXII, p. 21.

It should be emphasized that the "percentage" method, as applied in New York, provides for varying percentages of manual rate depending upon the classification. Without going fully into the ratemaking method employed, which was fully covered in J.M. Cahill 's paper*, let it suffice to say that all classifications were assigned by actuarial and engineering judgment to three hazard groups. A single ratio of excess losses to serious losses was determined for each hazard group based on a study of more than 2,300 cases. The classification percentage recognized this ratio, the classification ratio of serious to total losses, and a proper loading for expenses. Assuming that the excess losses (or excess pure premium) vary widely by classification, it is more likely that the indicated variations between "large" and "small" risks are primarily due to the types of classifications which predominate in those groups. This theory gains more credence when it is noted that in some industry groups the large size has a higher pure premium while in others it is lower, thus indicating that size of risk, in itself, is not necessarily significant. While time does not permit actual testing, I suggest that if the "percentage" rates were extended by a set of classification payrolls (for New York or any other state) further subdivided by size of risk, the average rates obtained would vary in much the same manner as the pure premiums developed by Mr. Elliott's study. If so, this would seem to refute his argument that such rates are actuarially unsound merely because of a demonstrable variation between premiums sizes groups in a give industry group. Obviously, the method which was employed may be subject to criticism of one type or another, but to be classed as "actuarially unsound" seems unnecessarily harsh.

* P.C.A.S. Vol. XXVII

REVIEWS OF BOOKS AND PUBLICATIONS

CLARENCE A. KULP, BOOK REVIEW EDITOR

Bond Value Tables. John. Hage. Martinus Nijhoff, The Hague, 1946. Pp. XII , 243.

These tables were originally published in Holland, and the accompanying explanatory text is an English translation of the original Dutch text. The book contains 4 main tables:

Table I	Irredeemable Loans.
Table II	Loans Redeemable in one Sum.
Table III	Loans Reedemable by Equal Installments.
Table IV	Loans Redeemable by Annuities.

In constructing these tables the following assumptions were made.

1. The face amount of the loan is 100.

2. The loanee pays interest on the loan semiannually at a nominal interest rate of 100j.percent. For definiteness, this nominal annual interest rate, 100j, will here be called the coupon interest rate.

3. In Table II the loanee repays the face amount of the loan in one sum at the end of the term of the loan. In Tables III and IV the loanee makes partial repayments of principal at the end of each year during the life of the loan.

4. The interest rate on the loan obtained by the loaner is computed on an effective annual rate basis. This effective annual interest rate, 100r percent, will here be called the yield rate.

The content of each of the 4 tables and the range covered in each case are as follows:

Table I Irredeemable Loans. The arguments of this table are the coupon interest rates, 100j, and the yield rates, 100r. Each entry in this table represents the present value, computed at an effective annual yield rate of 100r percent, of a perpetuity of coupon interest payments of 50j per 100 face amount of loan, payable semiannually (that is, a nominal annual coupon interest rate of 100j percent, payable twice a year). These entries are tabulated to two places of decimals.

The range and tabulation interval for the arguments of the tables are the following:

Argument	Range	Tabulation Interval
100j	2.5 - 7	0.5
100r	2 - 8	0.125

Table II Loans Redeemable in One Sum. The arguments of this table are the term of the loan in years, n: the coupon interest rate, 100j; and the yield rate, 100r. Each entry in this table represents the sum of the following two present values, computed at an effective annual yield rate of 100r percent:

1. The present value of the redemption payment, 100, made at the maturity of the loan.

2. The present value of coupon interest payments of 50j each, made semiannually.

These entries are tabulated to two places of decimals. The range and tabulation interval for the arguments of the table are as follows:

Arguments	Range	Tabulation Interval
n	1 - 80	1
100j	3 - 7	0.5
100r	2 - 8	0.125

Table III Loans Redeemable by Equal Installments. The arguments of this table are the number of years in the life of the loan, n; the coupon interest rate, 100j; and the yield rate, 100r. Each entry in this table represents the sum of the following two present values, computed at an effective annual yield rate of 100r percent.

1. The present value of partial repayments of principal, each equal to 100/n and made at the end of each year during the term of the loan.

2. The present value of the coupon interest payments made semiannually during the life of the loan. In any year each of the two semiannual coupon interest payments is equal to 50j percent of the principal of the loan outstanding at the beginning of that year.

These entries are tabulated to two decimal places, and the arguments of the table have the following range and tabulation interval:

Argument	Range	Tabulation Interval
n	1 - 80	1
100j	3 - 7	0.5
100r	2 - 8	0.125

Table IV Loans Redeemable by Annuities. The arguments of this table are the number of years in the term of the loan, n; the coupon interest rate, 100j and the yield rate, 100r. Each entry in this table represents the sum of two present values, computed at an effective annual yield rate equal to 100r percent, of the following two portions of an annuity:

1. The present value of the portion of the annuity relating to the repayment of principal of the loan, and payable at the end of each year during the life of the loan.

2. The present value of the portion of the annuity relating to the payment of coupon interest on the loan, and payable semiannually during the term of the loan.

The entries are tabulated to two decimal places, and the range and tabulation intervals of the arguments are as follows:

Argument	Range	Tabulation Interval
n	1 - 80	1
100j	2.5 - 7	0.5
100r	2 - 8	0.125

In addition to these 4 tables the book under review contains sections on *Notes Re Application of Tables* and on *Composition of the Tables and Formulae Applied.* There are also 3 auxiliary tables which can be used in solving the various types of problems relating to loans which are discussed in the first of the above-mentioned sections. According to the author one of the features of the 4 main tables is the fact that all particulars relating to a given period of a loan are shown on one page, which greatly facilitates the practical use of the tables. Also, it has been found possible to insert auxiliary columns on each page of Tables I to III which enable the reader to calculate in a simple way such matters as coupon-tax and redemption of the loan at a premium and to perform linear interpolation on these tables.

From the foregoing discussion it is evident that the term, bond, in the title of the book is used in a much broader sense than is customary in the United States. In this country the term, bond value table, would be applied only to Table II. The use of an effective annual yield rate in these tables rather than a nominal annual yield rate, convertible twice yearly, is also somewhat different practice from that followed in most of the tables published in this country.

While this set of tables would serve as a handbook for making rough computations with reference to various types of loans, yet it would seem to this reviewer that these tables could not well be used for more accurate results owing to the fact that the entries in all cases are carried only to two decimal places, and the yield rate interval in all cases is 1/8 percent. It is true, of course, that in cases where the more accurate results are desired these tables could be used to provide good first approximations.

Otto C. Richter

Compulsory Health Insurance. Elizabeth W. Wilson. Studies in Industrial and Collective Security, No. 3. National Industrial Conference Board, Inc. N.Y.C., 1947. Pp. 138.

The president of the National Industrial Conference Board says, in his foreword to Miss Wilson's Book:

> As in other welfare measures, much of the current argument on both sides is emotional and highlights the needs or desires of certain groups in our society. Questions of cost, economic feasibility and quality of service are for the most part unexplored in proposed legislation or are given secondary treatment. Too often we embark upon such problems in the belief that a modest initial provision cannot hurt our economy or upset our time-tested way of doing things. Only later do we discover that the costs have mushroomed; that vested interests in the experiment's continuance have become influential, ambitious or entrenched; that what was at first a modest demand has become gigantic, insistent, economically dangerous, and politically irresistible.

This book "explores in detail the questions of cost and practical feasibility which should be answered before an informed decision on this far-reaching change can be made". Miss Wilson is frankly opposed to compulsory health insurance and this analysis sets forth her reasons.

The book summarizes very briefly the activities of state and national governments relating to health insurance studies and legislation in the period from 1912 to 1944, and describes in more detail the Wagner-Murray-Dingell Bills of 1945. The main part of the book is a discussion of the W-M-D bills against Dr. Sinai's criteria: "The system must be medically sound, economically sound, socially sound and administratively sound." Within the limits of a small book Miss Wilson analyses the problems and objections associated with a governmentally operated system of compulsory medical care and cash sickness insurance. The book will be an essential source book on compulsory health insurance, both as a compendium of arguments and because of its complete documentation which provides an exhaustive bibliography.

The strongest section is that which discusses, against the background of British and German experience, the administrative problems of malingering by patients and over-doctoring by physicians The analysis leads to the conclusion that the solution of these problems would result in lodging considerable discretionary power in the chief administrator, operating through an army of medical policemen; a situation which, in turn, would cause rigidity of medical treatment and ineffective use of the supply of physicians, at excessive cost and with no guaranty of successful results.

The section on medical adequacy makes use of the argument that there are not enough hospital beds, not enough physicians, nurses and dentists, to implement a system of compulsory medical care at the same high level of medical practice which we enjoy today, and that it would be unwise to enact legislation guaranteeing hospital and medical care which could not be provided even if, in all other respects, the system worked satisfactorily. To that argument the social planners might reply that they would defer the full application of the ultimate services envisioned by the bill until they had planned into existence an adequately enlarged supply of hospital beds and medical personnel. Miss Wilson, however, summarizes the arguments for believing that bureaucratic methods of recruiting, training and management would result in poorer medical care and a much lower caliber of medical personnel than can be developed under voluntary non-governmental organization of medical care. She argues that the problem of providing medical care for the small proportion of the population who need assistance does not require that we regiment the rest of the population and the entire medical profession.

The section on economic feasibility is primarily concerned with the dollar cost of a compulsory health system. Several valuable pages discuss the size and incidence of the taxes which would be necessary to support such a system. The book does not point out, however, that the greatest cost of such a system would be measured not in terms of dollars but in terms of increased friction in the economic machine, in dampened progress, in generally lowered efficiency and in a lower standard of living, even for the poorest segment of society, than we can attain if we refrain from compulsory methods. For the issue of socializing medical care is but a part of the general issue of socialization versus incentive competition. It is easy to make an emotional case for socialization as a "liberal" measure. It is equally easy to make a strong logical case against it. It is unfortunate that political decisions commonly over-value emotion and under-value logic.

In discussing these issues we have somehow fallen into the unfortunate habit of regarding socialization as "liberal" and competitive enterprise as "reactionary". The "liberals" speak eloquently of their ideals but the believers in incentive enterprise have been relatively non-vocal and too frequently have seemed to apologize for their belief. We need today a modern Adam Smith to reestablish popular understanding that the profit motive, properly policed, is a strong power for social good and as such should engender pride rather than apology in its believers; and to help delineate the boundary between constructive policing of the profit motive and destructive interference therewith. This book does not approach that goal but it contains arguments and sources which the modern Adam Smith would use in discussing the compulsory health insurance phase of the major issue.

Jarvis Farley

How to Buy Insurance, Philip Gordis, W. W. Norton & Co., New York, 1947. Pp. xviii, 352

The purpose of this book, as stated in its Foreword, is "...to guide the average person in buying *all* the usual insurance he may require on his life, his health, his retirement, and the various types of property he owns. The emphasis throughout is on the actual procedure to follow in order to enjoy the maximum protection at the minimum cost." It is not intended for the professional insurance buyer, as might be supposed from its title, but for the uninformed layman. Unfortunately perusal by the average layman no doubt will lead him to the erroneous belief that he is now well-informed and that he can act as his own insurance adviser. The results of such policy may well be disastrous.

The book is written in "popular" style. It cannot be reviewed according to the standards applicable to a text, a research study or a professional article; it measures up in no respect to such works. It represents no real contribution to insurance literature but merely describes the coverages afforded by a variety of insurance contracts, attempts to find "bargains" in insurance coverage and to set forth rules to follow to "avoid the pitfalls of inadequate or improper insurance at the same time as you keep your insurance outlay down to the absolute minimum." Among such pitfalls the author includes the coinsurance clause in fire insurance, referring to it as "an agreement you may have entered into without knowing it."

The author divides the book into 7 sections, "each of which may be read as a unit," but for purposes of this review they can be consolidated into two groups, one on property and liability insurance and the other on personal insurance.

The principal advice of the author with reference to property and liability insurance is repeated in chapter after chapter. It boils down to placing insurance in a mutual, dividend - paying company on a 3-year term basis whenever possible. As for the first part of this advice, serious consideratioh is given only to the question of comparative cost of insurance. The question of safety is met by recommending certain mutual companies and suggesting that inquiry be made to the State Insurance Department which "will furnish without charge an appraisal of any company that operates in the state" and by checking in an accepted insurance rating publication. The question of company or agency service is not considered at all except to state that most of the companies recommended by the author "operate agencies or accept business from all regularly licensed brokers. Your own agent or broker can usually place your insurance in one of these companies without undue difficulty." In the opinion of this reviewer, the most important problem of the layman in obtaining insurance is to choose a competent agent or broker with a professional attitude, and trust to his judgment for advice as to coverages and for service at any time it may be required, especially in case of loss. Furthermore, choice of a particular carrier is more important than choice of type of carrier.

With the second part of the author's advice, that insurance be placed on a 3-year term basis, little fault can be found. However, the unsubstantiated statement is made that "Policies may usually be purchased for 5 years too, but the extra savings involved does not warrant this procedure." No mention is made of the reinstatement requirement and the consequent unearned premium risk in comparing annual and term policy costs; the interest factor is merely mentioned in passing.

The author's recommendations (pp. 13-14; see also p. 110) as to the procedure to follow in changing from annual non-dividend policies to 3-year term mutual policies are carelessly expressed and ambiguous. Is it the author's intent that the holder of a one-year, non-dividend policy should have it "rewritten in the same company for a 3-year period" or should he "wait until the expiration of the present policy and have it renewed (*sic*) in a mutual, dividend-paying company"? No doubt the latter is what the author has in mind, but he does not limit the former recommendation to dividend-paying policies. The average layman would hardly discover the inconsistency between the former recommendation and the author's basic recommendation to obtain dividend-paying insurance.

Among the illustrations to show the saving in cost which can be accomplished by following the author's advice is one involving residence burglary and theft insurance (pp. 22-23). It is assumed that with an agent's or broker's advice a policy would be written on the most expensive and inappropriate basis -- the "100% blanket" form. Comparison is then made with the cost of a "divided cover" form, including specifically described items, which properly fits the items included in the illustration. Naturally a savings is shown, but it is not pointed out that the "divided cover" form is the form most frequently used and that a competent agent or broker would hardly suggest writing the given risk on the 100 per cent blanket form; in fact, it is stated that "It is fairly common to find insurance on a household such as outlined above written without breaking the property down according to its type."

The book does contain some good advice and suggestions. The author emphasizes the desirability of inventorying one's property, of carrying full or substantial insurance to value, of having different policies concurrent, of insuring the liability hazard beyond the basic policy limits, of accepting a deductible clause in one's automobile collision insurance, and of various other accepted insurance procedures. But he argues against "rental value" and "additional living expense" covers (p. 100) and contends that the hazards other than windstorm in the extended coverage endorsement are relatively unimportant in the average insurance program(p. 98).

The principal advice of the author with reference to life insurance is to buy nothing other than short term insurance policies renewable at least until age 65. He even advises dropping higher premium policies one may now be carrying and replacing them with term insurance. Here the reasoning of the author is most shallow but his writing is likely to be quite persuasive to the average layman. He has resurrected the old arguments against life insurance for any purpose other than pure protection--arguments which Linton answered so ably 10 years ago in *Life Insurance Speaks For Itself*. One can hardly believe that Gordis is acquainted with Linton's work, yet one of the very few footnote references in his book is to this source (p. 172).

On pages 128 to 130 a comparison is made between the cash value of a $10,000, 20-year endowment insurance policy and the accumulation of 2½ per cent of a straight savings fund in which is deposited each year an amount equal to the premium, less dividend, payable under the insurance. The savings fund is shown to have accumulated $949 more than the endowment insurance policy by the end of 20 years. No allowance is made by the author for the cost of protection under the policy. The conclusion is reached that "purely as a method of savings, the life insurance policy is definitely not recommended." Subsequently (p. 131) the author points out that "a life insurance company...must incur special expenses which the saving or investment organization is spared. The operating costs...must be paid out of the policyholders' premiums. But the more important in the expense account of the life insurance company, of course, is the *insurance* factor which the savings institution naturally avoids." Such reasoning "speaks for itself" -- but not well.

In discussing life insurance as a means of saving and investment none of its advantages are mentioned although the author recognizes some of them - for example, he advances them as reasons for not having insurance proceeds paid in a lump sum. Also he suggests, rather inconsistently, that one might leave dividends to accumulate with the insurance company.

Not only is one who follows the author's advice in danger of placing his insurance improperly on a renewable term insurance basis, but he is also in danger of improperly estimating the amount of his insurance needs. On page 151 the author illustrates how one proceeds to determine the amount of insurance necessary to provide $150 a month for 10 years and $70 a month thereafter during the lifetime of one's wife, now age 45. A table, the basis of which is not disclosed and in which no differentiation is made between males and females, indicates that $2,640 will supply a monthly income of $10 for life to a beneficiary age 45. Therefore $18,480 is required to provide the lifetime income of $70 per month. At 2½ per cent interest, $1,064 is required to provide an income of $10 per month for 10 years certain. Therefore $8,512 is required to supply $80 per month for 10 years certain. The conclusion is reached that $26,992 will provide $150 per month for 10 years and $70 a month thereafter during the lifetime of the beneficiary. Unfortunately one who counts upon $150 a month to care for a wife and children during the first 10 years while the children may be dependent must be certain that the wife will live throughout those 10 years. If she dies before 10 years, the income for the remainder of the 10 year period will be reduced to the inadequate level of $80 per month. The average layman would be wise to entrust his life insurance programming to more experienced, careful hands.

Many other criticisms of this section might be made but this review already is longer than the book merits in the *Proceedings*.

C. M. Kahler*

Insurance Principles and Practices. Robert Riegel and Jerome S. Miller, Prentice Hall, N.Y.C. 1947, Third Edition. Pp. xi, 788.

This book is a gem. It is written in a lucid, crisp, simple style. It is refreshing reading experience after the fog of complexity and ponderousness one finds all too frequently in technical literature.

In a formal sense this book is a revision of two previous editions. Actually, it is a new book. Eighteen years have elapsed since the last revision. The changes in the ever dynamic insurance institution

*Guest Reviewer

during this period have been bombshell in character. This left the authors with a mere foundational shell to work on. They have wrought well.

The book runs the full gamut of private and social insurance. It tries valiantly to do all this in 767 pages, a Brobdingnagian task. To impart coherence in the presentation there are 9 major subdivisions. The first Part deals with *Insurance in General*. It covers the fundamental facts of insurance life such as: types of insurance carriers; structure of the insurance business; uses of insurance. Part II is a description of life insurance. Part III brings together the insurances against disability; accident and health; workmen's compensation; social insurance. Parts IV and V encompass the field of fire insurance and related risks. Part VI *Insurance Against Transportation Risks*, covers the marine area, ocean and inland. This exposition of the book's structural skeleton gives a clue to the mammoth proportions of the authors' task. A text of this type is probably the most difficult to write. The authors have to parcel out the lineage to each facet of the insurance institution with a New England conscience. The waves of minutiae in the business stand ready to engulf their frail literary bark at every turn. With remarkable success the authors have created a balance between depth and breadth of discussion. Occasionally they step off the deep end and lose their balance. An illustration can be found on page 42. The authors, discussing unemployment compensation, state: "Except when provisions are introduced to give employers the benefit of reduced premiums for continuous employment there is a lack of incentive to keep men on the payroll." Experience rating in unemployment compensation has been maligned and praised through hundreds of pages of material. Its benefits have been seriously questioned. With a stroke of a single sentence this moot problem is settled.

At the end of each chapter are a summary in outline form, a bibliography and problems. The summaries are genuine outlines of the chapters. They are testimonials to the fine sense of organizations of Dr. Reigel and his associate. They should be invaluable aids to teacher and student. The bibliographies are good but their presence in the text is questionable. The splendid project of the insurance librarians in issuing periodic compilations of the latest in insurance literature has made the need for bibliographies in text books academic. The bibliography in the text is a still picture of insurance writings. The work of the librarians is a moving photograph of the literature as it emerges in print. The problems are thought-provoking. They will be especially helpful to teachers to whom insurance teaching is a sideline endeavour and who do not have the time or background to develop their own problems.

The book needs another teaching aid, a teacher's manual which will develop information not susceptible to inclusion in the text but useful to the teacher for classroom discussion. An illustration can be found in the treatment of mutual carriers. On page 31 reference is made to "factory mutuals" but their mode of operation is not explained. Space is not available in the text for such description, but it could be placed in the teacher's manual.

A little over one-seventh of the book covers the field denoted as casualty insurance. The chapter on accident and health insurance is one of the stand-out efforts in the book. It is exhaustive and well organized. As evidence of the authors' skill in language economy, they cover the physical and financial losses occasioned by accident and disease, a definition of the field; a comprehensive outline of the measurers utilized to meet the problem - from workmen's compensation for the work injury to the Rhode Island health insurance law; a careful analysis of the commercial contracts and their provisions; a good statement of the rating system; a set of criteria for the purchase of accident and health insurance. To ramble a bit, it is interesting to note that the authors take seriously the distinction between accident and accidental means and go to some length to prove it--hypothetically. A reading of the cases on the subject reveals much confusion and uncertainty. The predictive power of legal precedent is a dangerous support to rely on in this question. One can think only of the colloquy between Hamlet and Polonious.

Poloniόus: What do you read, my Lord?
Hamlet: Words, words, words.

The chapter on workmen's compensation is excellent but, at least for the novice, emphasizes rate-making too much. The other casualty chapters are of high quality.

In the history of every new field of knowledge, first attempts at writing are descriptive in nature. As the field matures, the literature becomes both descriptive and constructively critical. In the insurance field most of our literature, at least in book form, has been descriptive. But the time is here when the experts who writes should not only describe but evaluate. In this way the industry's literary craft can always alert it to the need for improvement and development. Riegel's book takes a modest step in the path of evolution.

This book should become an insurance best seller. It deserves to be read by all who deal in insurance. For the beginner in insurance or the neophyte in a particular phase of the business, the book can be a challenging teacher and guide.

Laurence J. Ackerman*

*Guest Reviewer

Modern Pension Plans, Hugh O'Neill, Prentice-Hall, New York, 1947. Pp ix, 382.

This book is comprehensive in scope; it discusses the purposes and values of industrial pension plans and traces their development in this country. It describes, in elementary fashion, the tools needed to provide pensions and related benefits; these tools including annuities of different kinds, life insurance contracts with endowment or annuity provisions, group life insurance and pension trusts. It discusses fundamental provisions of retirement plans and the relative merits of different methods of funding and administering such plans, and ends with a survey of a group of 612 industrial pension plans in which a number of statistical tabulations are presented from the standpoint of particular characteristics.

The author estimates that there are some 7500 funded industrial pension plans in this country of which about 4800 are "individual annuity policy plans", 2000 are group annuity plans and 700 are self-administered. He states that possibly 95 percent of these plans have been established within the last 10 years, a great majority within the last 5 years, and that the greater proportion of individual annuity plans is found among employers with from 100 to 200 employees. He states that of 6 "individual annuity policies" major use is made of only the "retirement income policy". This is mentioned here particularly because the retirement income policy is usually classed as a life insurance rather than as an annuity policy and it is attractive to the life insurance companies because of the life insurance element. This is understandable when we bear in mind, as the author states, that "only a small minority of employees live, or remain in the employ of a particular employer until retirement age." Thus, while a retirement plan may be largely waste motion so far as providing retirement income is concerned, this objective serves as an incentive to substantial life insurance coverage when the retirement income policy is used, business which life insurance companies find profitable as is indicated by their encouragment of agents by means of commissions higher than on retirement annuity contracts, or by the companies' refusal to issue the latter.

A critical review of this study would be as long as the book itself because of the wide variety of topics and the controversial nature of many of them. The first 17 pages make use of the headings: *Whose Pension Plan?*, *Advantages of Pension Plans* (to employers), and *Who Pays for Pensions?* Discussion has been endless on these, and is not minimized in this book by the fact that the author labors the concept of pensions as deferred pay.

It is unfortunate that the author does not emphasize that his discussion is limited almost entirely to industrial pension plans, because many of his statements are true only when so limited and provision for retirement is far from insignificant in public employment and employment for non-profit institutions. In the industrial field it is true, as the author states generally, that pension plans have seldom been requested by employees; but it is equally true that in the field of public employment, outside the college field, the employer has rarely taken the initiative.

The retirement contract, rather than the retirement income policy is by far the most common means of funding retirement income for employees of non-profit institutions but the description of this contract given by the author is fundamentally inaccurate with respect to the bulk of contracts so used. This is of some importance because the absence of cash and loan values in a large majority of the retirement annuity contracts used in retirement plans of non-profit institutions, coupled with the complete ownership of these contracts by the employees (a status practically unknown in industrial plans), presents a substantially different philosophy of pensions than that prevailing in the industrial field. One consequence is that employer contributions are not interpreted as income to the employee at the time the contributions are made, despite the absence of any pension trust.

Another fundamental difference between the retirement annuity contracts used in industry and most of those now being issued to employees of private non-profit institutions and to employees of colleges and universities that are publicly administered institutions, is that, while the former fix premiums and the benefits that these premiums will purchase for the whole period of the contracts, the latter permit increases in premiums and provide that upon 3 months notice the purchasing power of premiums thereafter paid may be modified.

The author states, page 146, that the money purchase principle "is used rarely in individual annuity plans". Here again he is apparently thinking only of industrial pensions. The fact is that the money purchase method is used almost exclusively by non-profit institutions - and with individual retirement annuity contracts -and more than 500 such plans now exist.

Aside from the factual information furnished, the value of this book lies largely in its elementary presentation of tools of retirement plans and the fact that the reader is exposed to most of the arguments, pro and con, regarding many of the most controversial issues that surround methods of providing retirement income and related benefits. Little originality is shown in stating these arguments; the author usually avoids taking a strong position on any point and usually makes little effort to evaluate the relative merits of conflicting arguments.

Some typographical errors have crept in, and what the reviewer considers errors of statement are too numerous to discuss here. Perhaps this is inevitable in a work of this sort but there is evidence that the book may have been somewhat hastily thrown together. Nevertheless it will give the reader a generally accurate impressions of developments in industrial pensions, something difficult to get from any other single volume. But the novice should read much more widely and discuss pension problems with other workers in this field more mature than himself before he feels qualified to form opinions. Wisdom is attained only by the process of successive approximations.

Rainard B. Robbins

Principles and Practice of Accident Insurance. W. A. Dinsdale. Buckley Press Limited, London, England, 1946, 1947. Parts I, II. Pp. 117. Parts I and II separately bound.

This rather curious little book of which the authors says in the preface, "This book is to some extent a departure from the orthodox in that it is a text-book mainly in note form", was primarily intended for the use of students preparing for the examinations of the Chartered Insurance Institute in the field of casualty insurance. Contrary to what might be the expectation of the American student it is not even mainly concernedwith personal health and accident insurance, but with the whole field of what in this country is called casualty insurance. In the section on *Scope of Accident Insurance* the author says, "Indeed, the accident department caters for all types of insurance for which provision is not made by the marine, fire and life departments."

The unique character of the book is that it starts out as a set of very condensed notes on the several topics discussed. These are printed on the right-hand pages which are numbered consecutively. There are a few explanatory footnotes on these pages, cited by letter reference. The left-hand pages are numbered the same as the right-hand with the letter "A" following. On these pages are more elaborate notes on the text of the righ-hand pages and citation of authorities. The reader is referred to these by number references in the text. These pages are headed "additional notes" and there is considerable blank space in them which the author explains is for the students' own notes. The citations to both footnotes and "additional notes" are printed in line in the text, not superscript as is the usual custom and, until the reader becomes accustomed to this practice, it is a bit confusing.

There are 3 chapters in Part I of the book dealing with *Principles:* I. *Introduction,* which discusses the scope of accident insurance, the history of its development, the classification of insurers (carriers), legal aspects, compulsory insurance, moral and physical hazards, the form of the contracts, etc.; II. *The Law of Contract: Its Application to Insurance Contracts;* and III. *Special Principles Governing Insurance Contracts: Their Application to Accident Insurance.* In this chapter are discussed the important concepts of good faith, insurable interest, indemnity, subrogation, contribution, method of apportionment and proximate cause.

Part II is entitled *Basic Practice*. It consists of 8 chapters (IV-XI inclusive) titled respectively *Proposal Forms, Cover Notes and Premiums, Policy Forms, Endorsements, Renewal Procedure, Claims, Other Features of Practice, Statutory Regulation of Accident Insurance*.

It appears to be more common in England to base the policy on a proposal (or application) than in this country and less uniformity in policy and proposal forms.

Throughout the book one is struck by the difference in terminology from that to which we are accustomed, though the difference is not confusing. *Cover notes* are referred to in this country as *binders*. It appears that policies are usually issued from head offices and not by agents, and agents are less often than here authorized to bind. The smaller area with opportunity more promptly to contact the head office may account for this difference in practice.

The value of this book to members of this society will, we think, be in the concise presentation of the main points of English practice in casualty insurance with which ours may be compared. There is naturally much in common but notably there are considerable differences.

A. H. Mowbray

Workmen's Compensation Insurance. Frank Lang . Richard D. Irwin, Inc., Chicago, 1947, Pp. 139.

The extent of accelerated interest in the use of statistics as the means of knowing where an underwriter is treading or what an industry is doing, by way of experience, is very well reflected in this book by Mr. Frank Lang of the Division of Research of the Association of Casualty and Surety Executives. The book is undoubtedly the result of extensive work and has the earmarks of having cost its sponsors a good deal of money.

Worded largely in lay language, the text is built around the experience of state funds and private insurance companies, giving in detail for a number of years numerous break-downs on the various phases of compensation underwriting experience. The book is written in language that anybody familiar with insurance matters can understand.

The book is arranged in 4 parts, an appendix and an index. To the professional man Part I, and Chapter 1, will be more than reading matter. It deals with the growth of workmen's compensation insurance and the progress it has made. Part II, Chapter 2, deals with the payment of benefits including the subject of dishonest claims and time-lag in paying claims.

Chapter 3 concerns medical and rehabilitation services, and Chapter 4 discusses industrial accident prevention with emphasis on the efforts of safety bureaus and other organizations and accident prevention work in monopolistic funds.

In Chapter 5 an analysis is given of the cost of workmen's compensation insurance, rate-making procedures and rate-making principles.

The Appendix contains a number of tables including exhibits of experience of various industries in various states, average annual wages, and employment by industry and state.

The book is recommended as reading matter for candidates for membership in the Society.

H. Economidy

PUBLICATIONS RECEIVED

Innkeepers' Liabilities to the Public (With Appendix on Common Carriers' Liabilities). W. A. Dinsdale, 2nd Edit. Buckley Press Ltd., London 1947.

ACCIDENT RATES WITH CONFIDENCE LIMITS

BY

ELI A. GROSSMAN

The pure premium formula for an individual risk is generally based on an average annual accident rate determined by

$$(1)\quad \bar{n} = \frac{n_1 + n_2 + \cdots \quad n_k}{k}$$

$\bar{n}$ = average annual accident rate
n_i = number of accidents in the ith year for the risk
k = number of years of experience
This gives the simplest and most plausible estimate for the actual rate. However, it is obvious that the actual accident rate may be greater or less than this. In fact, in the limit, it is equally likely to be on either side. What is wanted in practice is a safe estimate that is the smallest upper bound for which we can be reasonably confident that the actual rate will be less than this bound.

This paper proposes a method for finding this bound, such that when given a certain confidence level, say, 95% then the method will give a bound which is greater than the actual rate 95% of the time. Of course, 100% certainty cannot be obtained, but the method can be applied to any other confidence level. In the following discussion, 95% has been used, since it seems to be a reasonable level for practical use.

The method is based upon the confidence levels of the Poisson Exponential Distribution*. Because the Poisson Distribution, as used here, gives the probability of a certain number of accidents and not the probability of a certain loss, the number of accidents observed and the actual accident rate will be treated. It may be that sometimes it is desirable to find loss rates. Given the losses, by assuming an average loss per accident, the number of accidents may be obtained. After determining the bound for the accident rate, it can be translated back to losses. For a more exact and theoretical answer, the Poisson Exponential could be modified to account for this if the distribution of the losses are known**. However, in this paper, the details of such a refinement are not discussed.

To illustrate the procedure, consider the case when only one year of experience is given. Let a be the actual unknown accident rate and n the number of accidents observed in one year. It is known that given a, the probability of n accidents denoted by p is

$$(2)\quad p = \frac{e^{-\alpha}\alpha^n}{n!}$$

The problem in question is the converse: given the value of n, what can be said about a? It will be shown that 95% of the time a is not greater than A where A is defined by the equation

*The application of confidence limits to the Poisson Exponential was first done by W. E. Ricker in a paper "Fiducial Limits of the Poisson Frequency Distribution Journal of the American Statistical Association, June, 1937.

**See "Notes on Mathematical Statistics" by F. E. Satterthwaite Proceedings, Vol. XXIX.

$$(3)\quad \sum_{j=0}^{n} \frac{e^{-A} A^{j}}{j!} = .05$$

Table #1 gives values of A corresponding to values of n from 0 to 83

Now the application of the method simply consists of taking the number of accidents per risk during the year denoted by n, and entering table #1 for the value of A to be used.

Example 1. Suppose one years experience shows that 6 accidents occurred. What rate is to be used for 95% confidence? Referring to table #1 for $n=6$, it is found that $A=11.8$, so that if it is stated that the actual accident rate is not greater than 11.8, that will be correct 95% of the time.

In the case of k years experience, the equation corresponding to (3) is

$$(4)\quad \sum_{j=0}^{k\bar{n}} \frac{e^{-kA}(kA)^{j}}{j!} = .05$$

By means of this formula, the same table as before may be used, by entering with $k\bar{n}$ which gives kA, and since k is known, A may be found.

Example 2. Given the data below, for a five year period, what average yearly accident rate should be used for 95% confidence?

Year	No. of Accidents
1941	6
1942	10
1943	8
1944	4
1945	12
Total	40

Here $k\bar{n} = 40$ and from table #1, this gives $kA= 52.1$. Since $k=5$, then $A=10.4$

For values of n greater than 83, the relation between A and n is very closely given by

$$(5)\quad A=n+1.353+1.645\sqrt{.676+n}$$

Example 3. Given a total of 900 accidents for a risk for a period of 5 years, what yearly value should be used to have 95% confidence? This number is beyond the end of the table, and so asymptotic equation (5) is used, where $k\bar{n}$ is substituted for n and kA' for A. This gives

$$kA'=900+1.353+1.645\sqrt{.676+900} \qquad \text{or}$$
$$A'=190$$

Appendix

In the mathematical theory below, the following assumptions are made,

1. The actual accident rate or hazard remains constant during the period of investigation.
2. The distribution of accidents may be represented by the Poisson Distribution.

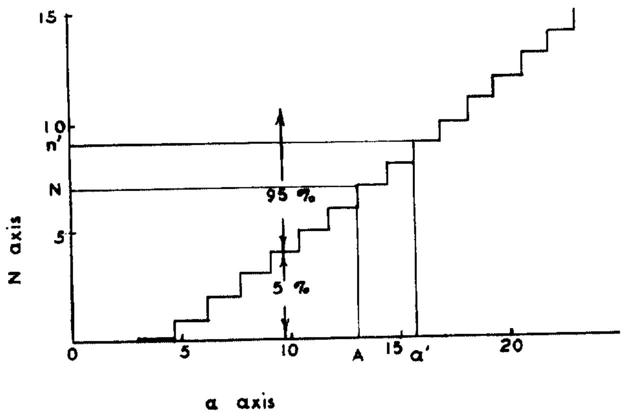
First the statement will be proved for one year's experience. It is known that given a, the probability of n accidents, p, is given by

$$p = \frac{e^{-\alpha}\alpha^n}{n!}$$

For each value of a, the value of n, N say, is found such that

$$\sum_{j=0}^{N} \frac{e^{-\alpha}\alpha^j}{j!} \leq .05 < \sum_{j=0}^{N+1} \frac{e^{-\alpha}\alpha^j}{j!}$$

A graph of N versus a would look like this



By our construction, for each value of a, the probability of a value of N underneath the curve is 5% while the probability of a value of N above or on the curve is 95%. Now given N we move over from the left until we reach the curve. The value of a will be called A. Now it is clear that if the actual value of a were say a' greater than A, the probability of getting any value of N less than n' is only 5%. Since the observed value of N is less than n', it may be said 95% of the time the actual value of a is less than A.

Now consider the case of k years experience. The probability, P, of a certain set of values say $n_1, n_2, \ldots\ n_k$ is given by

$$P = \frac{e^{-\alpha}\alpha^{n_1}}{n_1!}\,\frac{e^{-\alpha}\alpha^{n_2}}{n_2!}\cdots\qquad\frac{e^{-\alpha}\alpha^{n_k}}{n_k!}\quad\text{or}$$

$$= \frac{e^{-k\alpha}\alpha^{n_1+n_2+\cdots\quad n_k}}{n_1!\;n_2!\cdots\qquad n_k!}$$

$$= \frac{(k\bar{n})!}{(k\bar{n})!}\,\frac{e^{-k\alpha}\;\alpha^{k\bar{n}}}{n_1!\;n_2!\cdots\qquad n_k!}$$

Now P must be summed for all possible ways that $\bar{n}$ could occur, but imposing the condition that

$n_1 + n_2 + \cdots \qquad n_k = k\bar{n}$

where $n_1, n_2, \ldots \qquad n_k$ vary with integral positive values and $k\bar{n}$ is fixed. Denoting that sum by $\sum P$ so that

$$\sum P = \frac{e^{-k\alpha}}{(k\bar{n})!}\sum\frac{(k\bar{n})!\;\;\alpha^{k\bar{n}}}{n_1!\;n_2!\cdots\qquad n_k!}$$

The terms of the form

$$\frac{(k\bar{n})!}{n_1!\,n_2!\cdots\qquad n_k!}$$

are the coefficients of $x^{n_1}y^{n_2}\ldots\quad w^{n_k}$
in the expansion of *

$(x + y + \cdots \qquad w)^{k\bar{n}}$

*See Higher Algebra by Hall and Knight Chap. XV.

By letting

$x = y = \dots \qquad w = 1$

we find that

$$\sum \frac{(k\bar{n})!}{n_1!\, n_2! \dots \quad n_k!} = k^{k\bar{n}}$$

and it follows that

$$\sum p = \frac{e^{-ka}\ (ka)^{k\bar{n}}}{(k\bar{n})!}$$

which shows that the expression for k years is the same form as for one year, and that exactly the same argument may be applied as before.

Table #1 was constructed from "Poisson's Exponential" by E. C. Molina. In this book integral values of

$$\sum_{n}^{\infty} \frac{e^{-a} a^n}{n!}$$

are given for values of a from zero to 100. In order to satisfy equation (3) values of a were determined by linear interpolation to the nearest tenth for integral values of n for which

$$\sum_{n+1}^{\infty} \frac{e^{-A} A^n}{n!} = .95$$

As a increases, the Poisson distribution approaches the normal curve. By making use of the normal curve, we can express the asymptotic relation of A and n in terms of normal curve constants.

$A = n + 1.6449\sqrt{A}$ or

(6) $A = n + 1.353 + 1.645\sqrt{.676 + n}$

This type of relationship is also cited in the paper by Ricker. The figures in the schedule below compare A when actually computed and when found by asymptotic formula (6)

	Actual Computation	By Asymptotic Formula
n	A	A
1	4.7	4.5
25	34.9	34.6
64	78.8	78.5
81	97.5	97.2
100	118.1	117.8
150	171.7	171.5
175	198.4	198.2

To compute a table similar to table #1, but with different confidence limits, one could use these procedures. By means of the values in Molina's book, interpolate for the desired confidence as done above for 95%. The asymptotic formula

$$a = n + m\sqrt{a}$$

may be used. Here m is the ratio of the deviation from the mean to the desired point, over the standard deviation for a normal curve. For graphical readings, there are published charts of probability curves showing Poisson's exponential summation by Thorndike in Bell System Technical Journal, Oct. 1926.

Thanks are due Mr. Warren Page for carrying out numerical computations.

Table #1

For 95% Confidence Limits

n	A	n	A	n	A
0	3.0	30	40.7	60	74.4
1	4.7	31	41.9	61	75.5
2	6.3	32	43.0	62	76.6
3	7.8	33	44.1	63	77.7
4	9.2	34	45.3	64	78.8
5	10.5	35	46.4	65	79.9
6	11.8	36	47.6	66	81.0
7	13.2	37	48.7	67	82.1
8	14.4	38	49.8	68	83.2
9	15.7	39	50.9	69	84.3
10	17.0	40	52.1	70	85.4
11	18.2	41	53.2	71	86.5
12	19.5	42	54.3	72	87.6
13	20.7	43	55.5	73	88.7
14	21.9	44	56.6	74	89.8
15	23.1	45	57.7	75	90.9
16	24.3	46	58.8	76	92.0
17	25.5	47	59.9	77	93.1
18	26.7	48	61.1	78	94.2
19	27.9	49	62.2	79	95.3
20	29.1	50	63.3	80	96.4
21	30.3	51	64.4	81	97.5
22	31.5	52	65.5	82	98.6
23	32.6	53	66.7	83	99.6
24	33.8	54	67.8		
25	34.9	55	68.9		
26	36.1	56	70.0		
27	37.3	57	71.1		
28	38.4	58	72.2		
29	39.6	59	73.3		

For values of n greater than 83 use the relation

$$A = n + 1.353 + 1.645\sqrt{.676 + n}$$

In all the above, n represents the number of accidents that are experienced, and A is the number of accidents to be used for 95% confidence.

OBITUARY

RAYMOND VAN ARSDALE CARPENTER

1875 - 1947

Raymond Van Arsdale Carpenter, a Charter Member of the Casualty Actuarial Society, died suddenly at his home in New York City on March 11, 1947 in his seventy-second year.

He was born on May 7, 1875 in Jersey City, New Jersey. After graduating from Plainfield, N.J., High School he attended Rutgers University and received the degree of B.Sc. in 1897 and was later honored by Rutgers with the degree of M.Sc. He was a member of the Phi Beta Kappa Society and the Delta Upsilon fraternity.

Mr. Carpenter entered the service of the Metropolitan Life Insurance Company in 1898 as a clerk in the Actuarial Division. He became a Fellow of the Actuarial Society of America in 1905. He was promoted to official rank as Assistant Actuary of the Metropolitan in 1909 and in 1922 was made an Actuary of the Company in charge of Industrial Actuarial work. He was appointed Senior Actuary in 1939 and retired from active service at the end of 1939.

As an internationally recognized expert on Industrial Insurance, he was the author of the article on that subject in the Encyclopedia Britannica. At various times he was called upon to lecture before the Insurance Society of New York and before students preparing for the Fellowship examinations of the Actuarial Society of America. In addition to the authorship of various articles relating to Industrial Insurance, he was co-author with the late Haley Fiske of An Epoch in Life Insurance, published in 1924, which detailed the history to that time of the Metropolitan Life Insurance Company.

Mr. Carpenter never considered a question superficially and his judgment was held in high regard. Of a quite and unassuming nature, his sterling qualities were best appreciated by those who knew him closest. His memory will be held dear by his friends and associates.

OBITUARY

ELMER H. DEARTH

1859 - 1947

Elmer H. Dearth, charter member of the Society, died on March 26, 1947 in Des Moines, Iowa, at the age of eighty-seven years.

Mr. Dearth was born June 6, 1859 in Sangerville, Maine. Beginning his career in Maine as a newspaper man, in 1883 he came to Minnesota, where he published two newspapers until 1891. He first became interested in insurance in 1889, when he was appointed deputy insurance commissioner of Minnesota. He served three terms as insurance commissioner from 1897 to 1905, then resigned to establish his own insurance firm in St. Paul, Minnesota.

In 1912 he moved to Detroit to become the secretary and general manager of the newly-organized Michigan Workmen's Compensation Mutual Insurance Company, now known as the Michigan Mutual Liability Company. In 1914 he became the secretary and actuary of the company. In 1915 he resigned to become the president of the Manufacturers and Traders Casualty Company, which name was changed in 1917 to General Casualty and Surety Company of Detroit. When that company was reinsured in 1931, Mr. Dearth remained in Detroit as an insurance counsellor for various manufacturing concerns. In 1934 he retired to his home in St. Paul.

By reason of his great age, Mr. Dearth had not attended any meetings in recent years. Only the older members will recall his friendly manner and helpful counsel arising out of an unnusually broad experience as an insurance commissioner and as an insurance executive.

OBITUARY

DAVID RALPH McCLURG

1895 - 1947

David Ralph McClurg was born on October 3, 1895 at Sheakleyville, Pennsylvania. Following graduation from Westminster College in 1917, he served in the first World War. He became an insurance examiner for two years with the Nebraska State Insurance Department and resigned to take the actuarial science courses at the University of Michigan. He was associated for one year with William B. Young, Omaha consulting actuary. In 1923 he was a co-founder of the National Equity Life Insurance Company of Little Rock, Arkansas. He served this company as secretary-treasurer and actuary until his death on April 27, 1947 at Little Rock, Arkansas.

Mr. McClurg took all the examinations of the Society, becoming as Associate in 1922 and a Fellow in 1923. He was also a Fellow of the Actuarial Society of America and of the American Institute of Actuaries.

CASUALTY ACTUARIAL SOCIETY

November 14, 1947

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	Emma C. Maycrink	*Editor*
	Thomas O. Carlson	*Librarian*
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	Harold J. Ginsburgh	1949
	Charles J. Haugh	1951
†*Ex-Vice-Presidents:*	Albert Z. Skelding	1949
	Harry V. Williams	1951
†*Elected:*	Arthur E. Cleary	1948
	J. W. Carleton	1948
	Arthur N. Matthews	1948
	Clarence A. Kulp	1949
	John A. Mills	1949
	Francis S. Perryman	1949
	George B. Elliott	1950
	N. E. Masterson	1950
	Jarvis Farley	1950

* Terms expire at the annual meeting in November 1948.

† Terms expire at the annual meeting in November of the year given.

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ABSTRACT FROM THE MINUTES OF THE MEETING

MAY 23, 1947

The semi-annual meeting of the Casualty Actuarial Society was held at the Carmel Country Club, Carmel, New York, on Friday, May 23, 1947.

In the absence of President Haugh, Vice President Cahill called the meeting to order at 10:30 A. M., the roll was called, showing the following thirty-six Fellows and eleven Associates present:

FELLOWS

Ault	Elliott	Oberhaus
Barber	Fondiller	Perryman
Berkeley	Ginsburgh	Pruitt
Blanchard	Goddard	Ross
Brown, F.S.,	Graham, C.M.,	Smick
Burling	Johnson	Smith, S.E.,
Cahill	Kormes	Valerius
Carleton	Linder	Van Tuyl
Carlson	Masterson	Williams
Cogswell	Matthews	Williamson
Crouse	Maycrink	Wittick
Edwards	Mills	

ASSOCIATES

Bailey	Grossman	Rowell
Black, N.C.,	Montgomery, J.C.,	Uhthoff
Furnivall	Myers	Warren, C.S.,
Gildea	Rodermund	Wieder

By invitation, a number of officials of Casualty insurance Companies and other organizations were present.

The minutes of the meeting held November 22, 1946 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 Educational Committee (Thomas O. Carlson, Chairman) submitted the Eighth Edition of the Recommendations for Study, which was approved by the Council to be effective with the 1948 examinations. These recommendations are included in this number of the *Proceedings*.

No formal papers were presented at this meeting of the Society.

Informal discussion of the following topics was participated in by the members of the Society and by representatives of insurance organizations:

1. Overall retrospective rating.

2. Uniform accounting, including size of risk experience, new forms of annual statement, simplification of accounting and statistical procedures, and related subjects.

3. The outlook for automobile insurance.

4. The improvement of exposure bases.

Upon motion, the meeting adjourned at 4 P.M.

ABSTRACT FROM THE MINUTES OF THE MEETING

NOVEMBER 14, 1947

The annual meeting of the Casualty Actuarial Society was held at the Hotel Biltmore, New York on Friday, November 14, 1947.

President Haugh called the meeting to order at 10:30 A.M., the roll was called, showing the following fifty-one Fellows and thirteen Associates present:

FELLOWS

Allen	Eppink	Perryman
Ault	Farley	Pruitt
Barber	Fondiller	Rodermund
Barker	Ginsburgh	Rosenberg
Barter	Goddard	Ross
Berkeley	Graham, C.M.	Rowell
Blanchard	Graham, W.J.	Salzmann
Brown, F.C.,	Haugh	Shapiro
Cahill	Johnson	Skillings
Carlson	Kelly	Smick
Carleton	Koloditzky	Smith, S.E.,
Coates	Kormes	Tarbell
Cogswell	Linder	Uhthoff
Comstock	McConnell	Valerius
Corcoran	Masterson	Van Tuyl
Crouse	Maycrink	Wieder
Elliott	Oberhaus	Williams

ASSOCIATES

Bailey	Hart	Stoke
Bugbee	Lufkin	Turner
Dowling	Marsh	Vergano
Grossman	Munterich	Wolfrum
	Scammon	

By invitation, a number of officials of casualty insurance companies and other organizations were present.

Mr. Haugh read his Presidential Address.

The Minutes of the meeting held May 23, 1947 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. Edward S. Allen, Loring M. Barker, M. Stanley Hughey, Matthew Rodermund, Norman Rosenberg, John H. Rowell, Ruth Salzmann, Dunbar R. Uhthoff and John W. Wieder, Jr. had passed the necessary examinations and had been admitted as Fellows: a diploma was presented to each by the President. John W. Clark, James B. Gardiner, Harold J. George, Stanley W. Gingery, Robert W. Lufkin, George C. Munterich, Robert C. Perry, Lawrence W. Scammon, Max J. Schwartz, Paul A. Turner, Elia Vergano and Richard J. Wolfrum had passed the necessary examinations and had been admitted as Associates. The eighth Edition of the Recommendations for Study are included in this number of the *Proceedings*.

The President announced the deaths since the last annual meeting of the Society, of three Fellows, Raymond V. Carpenter, Elmer H. Dearth and D. Ralph McClurg: obituary notices appear in this number of the *Proceedings*.

The Auditing Committee (Howard G. Crane, Chairman) reported that the books of the Secretary-Treasurer had been audited and his accounts verified.

The report of the Secretary-Treasurer was read and accepted. The report on finances follows:

CASUALTY ACTUARIAL SOCIETY
ANNUAL REPORT ON FINANCES

Cash Receipts and Disbursements from October 1, 1946 to September 30, 1947.

Income

On deposit Oct. 1, 1946 in Marine Midland Trust Co.		$3,902.15
Members Dues	$2,508.00	
Sales of Proceedings	1,100.76	
Examinations Fees	707.00	
Luncheons & Dinners	328.00	
Michelbacher Fund	444.95	
Mortality Tables Reprint	141.50	
Foreign Exchange	-5.73	5,224.48
Total........................		$9,126.63

Disbursements

Printing & Stationery	$4,336.47
Postage, Tel., Express, Etc.	188.63
Secretarial Work	470.50
Examination Expense	727.61
Luncheon & Dinners	403.56
Mortality Table Reprint	88.01
Miscellaneous	130.87
Total........................	$6,345.65
On deposit Sept. 30, 1946 in Marine Midland Trust Co.	2,780.98
Total........................	$9,126.63

Assets

Cash in Bank	$2,780.98
Bonds Owned	* 3,750.00

*Present Redemption Value is $4,660.00

Total Assets	$6,530.98

Liabilities

Unpaid Printing Bills:	$1,519.80
Michelbacher Fund	2,349.81
Fondiller Prize	100.00
Total Liabilities	$3,969.61
Surplus	2,561.37
Total Liabilities & Surplus	$6,530.98

The Examination Committee (George B. Elliott, General Chairman) submitted a report of which the following is a summary:

1947 EXAMINATIONS - SUCCESSFUL CANDIDATES

The following is a list of those who passed the examinations held by the Society on April 9 and 10, 1947:

ASSOCIATESHIP EXAMINATIONS

PART I:

G.S. Bloomfield	F. DeBartolo	R.D. Hostetter,Jr.(Sec.2)*
Ruby Bregman	D.P. Frame	N.F. Jones(Sec. 2*)
W.R. Burns	T.M. Galt	G.S. Ramsey
W.J. Carroll	H.J. George	J.A. Resony
R.W. Coble	G.E. Gould	E.A. Rode
	C.C. Hewitt,Jr.	

PART II:

C. Bloomfield	J.L. Dolby	C.C. Hewitt,Jr.(Sec.4)*
F.J. Bush	N.M. Franklin	N.F. Jones(Sec.4)*
R.W. Coble	T.M. Galt	R.A. Nix
W.W. Cooke	H.J. George	S.L. Olds
		E.A. Rode

PART III:

W.R. Burns	G.E. Gould	C.C. Hewitt,Jr.(Sec.6)*
R.B. Burstein	G.F. Letwin	N.F. Jones(Sec.6)*
G.L. Carter	S.L. Olds	C.N. Kaplan (Sec.6)*
J.W. Clarke	C. Reimer	R.D. Morse,Jr.(Sec.6)*
T.M. Galt	E.A. Rode	V.S. Zarowski
H.J. George	C.J. Stafford	

PART IV:

E.R. Benedict	C.C. Hewitt,Jr.	G.A. Reynolds
R. Bregman	E.S. Jackson	E.A. Rode
R.B. Burstein	A. Jenkins,Jr.	C.J. Stafford
M. Cheetham	N.F. Jones	W.I. Struble
F. DeBartolo	G.F. Letwin	H. Thompson
T.M. Galt	A.L. Mayerson	R.J. Wolfrum
G.E. Gould	C. Reimer	

PART V:

Edward S. Allen	William Leslie, Jr.	Max J. Schwartz
John W. Clarke	Robert W. Lufkin	Paul A. Turner
J.B. Gardiner	George Munterich	Elia Vergano
S.W. Gingery	Robert C. Perry	Richard J. Wolfrum
H.F. LaCroix,Jr.	Norman Rosenberg	John C. Wooddy

*Credited to veterans by the Council under Rule 4(d) which provides for having completed equivalent courses at Universities of recognized standards.

FELLOWSHIP EXAMINATIONS

PART I:

Loring M. Barker	M.S. Hughey	Harold W. Schloss
J.B. Gardiner	M. Rodermund	John W. Wieder,Jr.
	Ruth Salzmann	

PART II:

Edward S. Allen	M. Rodermund	Harold W. Schloss
Loring M. Barker	J.H. Rowell	John W. Wieder,Jr.
M.S. Hughey	Ruth Salzmann	

PART III:

Edward S. Allen	M. Rodermund	Harold W. Schloss
Loring M. Barker	Norman Rosenberg	D.R. Uhthoff
M.S. Hughey	J.H. Rowell	J.W. Wieder,Jr.
	Ruth Salzmann	

The Council's re-election of Emma C. Maycrink as Editor, and of Thomas O. Carlson as Librarian, was announced.

The annual elections were then held and the following officers and members of the Council were elected:

President......................James M. Cahill
Vice President.................Harmon T. Barber
Vice President.................Russell P. Goddard
Secretary-Treasurer............Richard Fondiller
Editor.........................Emma C. Maycrink
Librarian......................Thomas O. Carlson

Members of Council (terms expire in 1950)

George B. Elliott, N.E. Masterson, Jarvis Farley

(Term expires in 1949)

Clarence A. Kulp

(Term expires in 1948)

Arthur N. Matthews J.W. Carleton

The papers appearing in this Number were presented.

Informal discussion of the following topic was participated in by the members of the Society and by representatives of insurance organizations:

Problems of ratemaking under new rate regulatory laws.

Upon motion, the meeting adjourned at 4:40 P.M.

CASUALTY ACTUARIAL SOCIETY

EXAMINATION COMMITTEE
SEYMOUR E. SMITH, GENERAL CHAIRMAN

IN CHARGE OF
ASSOCIATESHIP EXAMINATIONS

CHARLES W. CROUSE, CHAIRMAN
EDWARD S. ALLEN
JOHN W. WIEDER, JR.

IN CHARGE OF
FELLOWSHIP EXAMINATIONS

ERNEST T. BERKELEY, CHAIRMAN
ROGER A. JOHNSON, JR.
SAMUEL M. ROSS

EXAMINATION FOR ENROLLMENT AS ASSOCIATE

PART I

May 11, 1948 *Time 9:30 to 12:30 o'clock*

1. (a) Prove that the sum of the squares of the deviations of any set of variates from their arithmetic mean, is less than the sum of the squares of their deviations from any other point.

   (b) Prove that if M_x be the arithmetic mean of observed values of X and M_y be the arithmetic mean of the corresponding observed values of Y, then the point (M_x, M_y) is on the line of regression of Y on X.

2. State the principle upon which curve-fitting by the Method of Moments is based. Then use that Method to fit a curve to the following data. Give the reason for your choice of the form of the curve.

w:	1	2	3	4	5
R:	.983	.986	.992	1.000	1.011

3. (a) From the following data, determine the value of r_{xy}.

Year	X	Y	Year	X	Y
1907	11	11	1912	14	12
1908	13	9	1913	15	12
1909	10	14	1914	16	7
1910	12	14	1915	11	12
1911	16	9	1916	12	20

   (b) Outline three methods which are used in weighting prices in the construction of price index numbers, and state the advantages and disadvantages of each of them.

4. Ω is an infinite class of cases in each of which a certain continuous variable, X, has a unique value. In 100,000 cases drawn at random from Ω, the values of X have been observed, and the characteristics of their distribution support the hypothesis that the cases in Ω are normally distributed with respect to X. The first and second moments of the observed values about $X = 100$, computed by grouping them in class intervals of width $w = 1.00$, were found to be -1.120000 and 101.3377, respectively.

   (a) Estimate (to the nearest .01) the probability that if a single case were drawn at random from Ω, the value of X in that case would be found to lie within the interval $M - 1$ to $M + 1$, where M is the arithmetic mean value of X for the entire class Ω. Sĕt forth the assumptions involved in your estimation.

   Given: $\frac{1}{\sqrt{2\pi}} e^{-\frac{t^2}{2}} = \phi(t) = .399$ for $t = 0$; $.397$ for $t = .10$

   (b) Estimate (to nearest 100) the minimum number of cases which would have to be included in a random sample drawn from Ω in order that the probability that the arithmetic mean value of X for the sample will lie outside the aforesaid interval, shall be not greater than .01.

   Given: $A_\phi\Big]_{2.58}^{\infty} = \int_{2.58}^{\infty} \phi(t)dt = .005$

5. (a) Prove that $a_{\overline{m+n}|} \equiv a_{\overline{m}|} + v^m a_{\overline{n}|}$

   (b) A man proposes to deposit D dollars in a savings bank on the last day of each month for k years, and to withdraw W dollars on July 1 of each year for t years, the first such withdrawal to be made six months after the last deposit. On each deposit the savings bank pays ordinary simple interest at the rate of $x\%$ per year from the first day of the month following the month in which the deposit is made; and in the account of every depositor, accrued interest is converted to principal as of the close of business on June 30 and December 31 of every year. Write a formula expressing in terms of x, k, t and W, the value which D must have in order that the balance in bank after the last withdrawal shall be exactly zero.

6. The values of $(1+i)^n$ required in solving problems (a) and (b) in this question, are to be obtained by expanding the function in a binomial series.

   (a) Find the present value (to the nearest dollar) of an annuity of \$120 per annum payable in equal monthly installments for 5 years, if money is worth 3% effective and the first payment is to be made 61 months after the date of valuation.

   (b) A perpetuity providing for the payment of \$1000 at the end of every fifth year is to be converted exactly two years after the date of the last such payment, to an annuity due payable annually for 6 years. If money is worth 3% effective, what should be the annual rent of the annuity? Express your result in the form $(a \times b) \div (c \times d)$ in which a, b, c and d are numbers expressed to four significant figures. Do not take time to perform the operations of multiplication and division therein indicated.

NOTE: The following values, each of which is stated for $i = .025$, will be useful in solving problems 7 (a) and 8 (a).

$$\frac{1}{a_{\overline{40|}}} = .039836 \qquad v^{10} = .78120 \quad v^{20} = .61027 \quad v^{30} = .47674$$

7. (a) What price shall be paid for a 5% non-callable bond of \$1,000 par value redeemable at \$1,070 on May 15, 1958, with interest payable on May 15 and November 15, purchased May 15, 1948, to yield exactly 5% nominal, convertible semiannually?

   (b) For the purchaser of the bond, outline a schedule for determining the book values thereof as of the dates upon which interest is payable, and complete the entries in the schedule for such dates through May 15, 1950.

8. A building just completed has cost \$300,000. It is estimated that its life will be 40 years; that at the end of each decade thereof, except the last, \$20,000 will be required for renovation; and that at the end of its life, the building will have a salvage value of \$20,000.

(a) Determine (to the nearest dollar) the sum which must be invested at the end of each year of its life, in a fund earning interest at an effective rate of 2½%, to cover the estimated requirements for renovation and to provide for replacement of the original cost less the estimated salvage value.

(b) Write a formula expressing the amount in the fund at the end of the 25th year of the building's life, if withdrawals therefrom for renovations have been made exactly in accordance with the estimated requirements.

PART II

May 11, 1948 *Time 1:30 to 4:30 o'clock*

1. (a) The curve $x^2y + 12y = 144$ has one maximum point and two points of inflection. Find the area of the triangle formed by the tangents to the curve at these three points. Sketch the curve, showing the triangle.

(b) Find the limit of $\dfrac{x^3-3x+2}{x^3-x^2-x+1}$ as x approaches 1.

2. (a) Find the function, $f(x)$, satisfying the following conditions:

$$D_x\, f(x) = \sec^3 x \qquad \text{and} \qquad f(0) = 0$$

(b) Evaluate: $$\int_0^1 x^2\sqrt{1-x^3}\,dx$$

(c) Prove that if $\theta < 1$, then $$\int_0^\infty e^{\theta x} \cdot e^{-x} \cdot dx = \frac{1}{1-\theta}$$

3. (a) Find the length of the spiral of Archimedes, $\rho = a\theta$, from the origin to the end of the first revolution.

(b) Expand $\cosh x$ into an infinite power series in x. What proposition would one have to demonstrate in order to prove that the series converges to $\cosh x$ for every real value of x?

4. (a) Prove that if $z = y^{\sin\phi}$, then $\frac{\partial^2 z}{\partial y \partial \phi} = z(1 + \log_e z)\frac{\cos\phi}{y}$

(b) Evaluate: $$\int_0^1\int_{y^2}^1\int_0^{1-x} x\,dz\,dx\,dy$$

5. (a) Given that $U_x = 2x^4 - 12x^3 + x^2 - 4x - 15$, find $\Delta^2 U_x$.

(b) Find the polynomial, $P(x)$, of lowest degree for which $P(0) = 1280$; $P(1) = 189$; $P(4) = 0$; $P(5) = 465$; $P(8) = 0$; and $P(10) = 0$.

6. (a) Given: $\rho(1000) = .474$; $\rho(2000) = .390$; $\rho(3000) = .338$; and $\rho(4000) = .305$. By interpolation, determine a value for $\rho(2500)$ and state the reason for your choice of the formula employed in your computation.

(b) Given the following table of values of $U_{x:y}$, determine by interpolation a value for $U_{3:2}$

	$y = 0$	$y = 5$	$y = 10$
$x = 0$:	0	75	300
$x = 5$:	25	200	525
$x = 10$:	100	375	800

7. (a) Find the sum of the first n terms of the series in which the xth term is

$$\frac{1}{(3x-2)(3x+1)(3x+4)}$$

If the series be infinite, to what value does it converge?

(b) Find the sum of the first n terms of the series:

$$2 + 8 + 24 + 64 + 160 + \ldots\ldots$$

8. (a) Prove that $\Delta^n o^m \equiv n(\Delta^{n-1} o^{m-1} + \Delta^n o^{m-1})$

(b) On the assumption that third and higher differences of the function $p(x)$ are negligible, develop a formula for approximate evaluation of $\int_0^1 xp(x)dx$ in terms of $p(0)$, $p(1)$, and $p(2)$.

PART III

May 12, 1948 *Time 9:30 to 12:30 o'clock*

1. (a) One bag contains 5 white and 3 red balls, and another bag contains 4 white and 5 red balls. From one of them, to be chosen at random, 2 balls are to be drawn. Compute the probability that they will be of different colors.

(b) A set S containing mn members has been divided into m subsets, each contain n members. Find the probability that k specified members of S are in the same subset, after r subsets have been examined and found not to contain any of the k specified members. ($1<k\leqq n$ and $0\leqq r<m$)

2. (a) If the value of x is to be chosen at random from the first one hundred positive integers, find the probability that $x+\frac{100}{x}$ will be greater than 50.

(b) Of two purses, one originally contained 3 dimes and 1 penny, and the other contained 3 pennies and 1 dime. A coin was drawn from one and dropped into the other, but it is not known from which purse the coin was taken. Then from each purse, a coin is drawn, and each of the drawn coins is found to be a penny. If neither of them be replaced, what are the odds against obtaining two pennies in a second drawing of coins, one from each purse? Set forth the assumptions upon which your answer is based.

3. If $6n$ tickets numbered 0, 1, 2, 3, ..., $6n - 1$ be placed in a bag, and three of them be drawn out simultaneously, show that the probability that the sum of the numbers on them will be exactly $6n$, is

$$\frac{3n}{(6n-1)(6n-2)}$$

4. (a) Prove that in an indefinite series of independent trials in each one of which the probability of success is a certain constant $p > 0$, the expectation (i.e., the probable value) of the number of failures preceding the first success is $\frac{1-p}{p}$.

(b) A and B propose to play a sequence of games. Of any single game of the sequence, the probability that A will be the winner is ½ and a drawn game is impossible. The loser in each game is to pay one dollar to the winner; and the sequence is to continue until one or the other has lost all of his money. A has m dollars and B has n dollars. Find the probability that A will win all of B's money.

5. (a) Express in commutation symbols the net level annual premium for each of the following policies issued at age 30 for a face amount of $1000.

(i) Ten year term insurance;

(ii) Ten payment twenty year endowment insurance;

(iii) Whole life insurance providing for the return, without interest, upon the death of the insured, of all net premiums paid prior thereto, in addition to the face amount of the policy.

(b) A certain life insurance policy provides for the payment of \$10,000 in event of death between the date of issue and age 41, \$9,700 in event of death between ages 41 and 42, \$9,400 in event of death between ages 42 and 43, and so on, the amount of insurance decreasing \$300 each year until it reaches \$1000 at age 70, after which it remains constant. Premiums are payable annually from date of issue to age 64, inclusive. Show that the net level annual premium for this policy issued at age x may be expressed as follows:

$$\frac{10{,}000M_x - 300(R_{41} - R_{71})}{N_x - N_{65}}$$

6. (a) Develop by the retrospective method an expression in commutation symbols for the 35th terminal reserve for a twenty payment life insurance policy issued at age 30 providing \$2000 in event of death before age 60 and \$1000 in event of death after age 60; and show that the result is equivalent to the expression for the same reserve obtained by the prospective method.

   (b) Define the three groups into which all life insurance policies are divided under the New Jersey Standard system of reserve modification. What modification determines the minimum reserves by that Standard for policies in each group?

7. From the equation which expresses the Gompertz-Makeham law of mortality, derive the formula:

$$l_x = ks^x g^{c^x}$$

Prove that if l_x be determined in accordance with this formula, and if w be defined by the equation: $2c^w = c^x + c^y$, then: ${}_np_{xy} = ({}_np_w)^2$

8. The symbols $l_x^{(r)}$ and $m_x^{(r)}$ are defined as follows:

$l_x^{(r)}$ = the number of widows living unmarried at beginning of age x;

$m_x^{(r)}$ = the number of widows remarrying during age x.

Develop a formula in terms of v, $l_x^{(r)}$ and $m_x^{(r)}$ for the present value (W) of an annuity due of one dollar per annum payable annually so long as a widow now of age x shall live and remain unmarried, together with a provision that B dollars shall be paid immediately upon her remarriage. Define symbols for the commutation columns which would facilitate computations of such present values, and then express W in terms of such symbols.

PART IV

May 12, 1948 *Time 1:30 to 4:30 o'clock*

1. (a) Discuss briefly the special considerations involved in the underwriting of non-cancelable accident and health policies.

   (b) Explain the difference in coverage between a Primary Commercial Blanket Bond and a Blanket Position Bond.

2. (a) Distinguish between the following residence theft coverages:

   (i) Divided Coverage;

   (ii) 50% Blanket Coverage;

   (iii) 100% Blanket Coverage;

   (iv) Specific Coverage.

   (b) The XYZ Lumber Company receives shipments of lumber by rail and the freight cars are unloaded at a platform on the premises. Deliveries to customers are made by the company's trucks. The company also operates a retail hardware and farm equipment store located on the same premises. List the coverages, and the hazards which each insures against, which you think should be included in a complete program of liability insurance protection for this risk.

3. (a) Outline the basic steps in the determination of the premium for a policy of boiler insurance including bodily injury liability coverage.

   (b) Of the factors relative to individual private passenger automobile risks which influence the judgment of underwriters in the selection of such risks for liability insurance, name the three which you consider to be the most important, and give the reasons for your answer.

4. (a) Distinguish between paragraphs One (a) and One (b) of the

insuring agreement in the Standard Workmen's Compensation and Employers' Liability Policy.

(b) What are the meanings of the terms "Ex-Medical Coverage" and "Full Medical Coverage" as they are used in Workmen's Compensation Insurance?

5. (a) What are the desirable characteristics of a premium basis?

(b) How is allocated claim expense treated in the making of premium rates for insurances of the following forms: Burglary; Glass; Automobile Liability; Workmen's Compensation; Boiler and Machinery?

6. (a) Why are loss and expense constants included in premiums for Workmen's Compensation Policies?

(b) How are revised manual premium rates for "non-reviewed" classes determined in the course of any state-wide rate revision under the present procedure of the National Council on Compensation Insurance?

7. (a) Discuss the problems involved in using experience on policies written in accordance with the Automobile Fleet Plan in the making of manual premium rates for automobile liability insurance on commercial vehicles.

(b) A large percentage of automobile owners have always been uninsured. Discuss the possibilitiy of developing a low-limits automobile liability policy, to be offered at rates lower than present rates for insurance under the basic limits of \$5,000/10,000 for bodily injury and \$5,000 for property damage, as a means of attracting some of the uninsured automobile owners.

8. In periods of general price and wage increases, such as those we have witnessed in 1946 and 1947, the natural lag in the experience available for premium rate making is of serious consequence. As a means of correcting the effects of the lag, discuss:

(a) the possibility of including a wage level factor in formulae for the determination of manual rates for Workmen's Compensation Insurance; and

(b) the possibility of including a general price index factor in formulae for the determination of manual rates for such lines as automobile property damage liability and glass insurance.

EXAMINATION FOR ENROLLMENT AS FELLOW

PART I

May 11, 1948 *Time 9:30 to 12:30 o'clock*

1. Discuss the comparative attractiveness of industrial securities as an investment for casualty insurance companies and explain what tests may be used to determine their desirability.

2. (a) Discuss the effect of government finance on monetary stability.

   (b) Describe the position of the government in the credit system.

3. (a) Under what circumstances does speculation create security from the standpoint of the economic theory of risk?

   (b) What was the threefold aim accomplished by the adoption of Workmen's Compensation Acts?

4. (a) Name three objects of the legal requirements of insurable interest.

   (b) What are the five elements of insurance coverage?

5. (a) Name three mandatory provisions in the New York Law which must be included in an automobile policy.

   (b) Discuss the powers of the New York Superintendent of Insurance with respect to rates for various lines.

6. (a) State the provisions of the All Industry Casualty and Surety Rate Regulatory Bill relating to the making of rates.

   (b) The All Industry Bill contains certain provisions intended to preserve competition and independent operation for the various insurers. Name three of these provisions relating to

i) Independent insurers

ii) Members or subscribers of rating organizations

7. As a result of the McCarran Act, many states have enacted rate regulatory laws which are intended to prevent the application of certain Federal anti-trust laws after the expiration of the present moratorium on July 1, 1948. Name these anti-trust laws, state briefly what they prohibit and explain the effect they have had on the drafting of state rate regulatory laws.

8. The stated purpose of the All Industry Bill and similar bills is to promote the public welfare. Do you believe the regulation of the casualty insurance business resulting from the adoption of these bills by the various states will be more beneficial to the public than the regulation in effect prior to the Supreme Court decision in the South Eastern Underwriters case? Discuss.

PART II

May 11, 1948 *Time 1:30 to 4:30 o'clock*

1. (a) Contrast the New York Automobile Liability and Public Liability Experience Rating Plans in their treatment of excess limits coverage.

   (b) Why is it necessary to place a limitation on the size of each loss to enter the rating in a "no-split" experience rating plan?

2. Under the National Council experience rating plan for Workmen's Compensation, it is possible for a risk having a 40.% loss ratio year after year to produce a substantial debit modification. How would you justify this result to a policyholder?

3. (a) Explain the purpose and calculation of expected loss rates in the National Council experience rating plan for Workmen's Compensation.

   (b) The experience rating plan of the National Council for Workmen's Compensation produces an off-balance. Explain why this occurs, the effect it has from a rate-making viewpoint, and what steps are taken, as a result, in the rate-making procedure.

4. The Workmen's Compensation experience rating plan of the National

Council is now available on an interstate basis in a number of states and provides for a single modification applicable to all the states included in the rating.
Discuss the advantages and disadvantages of having a different modification for each state and indicate one way in which such modifications might be calculated.

5. (a) The excess pure premium ratio table used in developing the Workmen's Compensation Retrospective Rating Plans A, B and C is keyed to an expected loss ratio of 59.8%. Why was it necessary to make an adjustment before entering the table for the determination of the insurance charges for states with different expected loss ratios and how was this adjustment made?

   (b) Discuss briefly the advantages and disadvantages of combining Workmen's Compensation with other third party liability lines under a single retrospective rating plan.

6. (a) Name and describe briefly four types of voluntary medical or hospital insurance plans in use in this country.

   (b) Discuss the advantages and disadvantages of cash as opposed to service benefits in a program of health insurance.

7. (a) Compare the provisions for financing and administration in the Social Security Act for old age insurance with those for unemployment benefits.

   (b) The Federal Old Age Insurance Tax is frozen at the 1.% level until 1950. Do you believe this is preferable to having it increase in accordance with the schedule originally set up? Discuss.

8. State the essential features of a complete social insurance scheme. What are the three outstanding characteristics of existing American programs for relief and social security that constitute major issues today and how can insurance carriers help in settling these problems?

PART III

May 12, 1948 *Time 9:30 to 12:30 o'clock*

1. (a) A common method of computing the unearned premium reserve on Workmen's Compensation business is to set up the deposit premium with a term of one year and then apply the semi-monthly unearned premium factors. In view of the fact that many policies in this line are on a periodic audit basis, do you think this method produces a proper unearned premium reserve? Discuss.

   (b) Discuss the requirements of Schedule P with respect to the following items:

      i) Allocated loss expense reserve
      ii) Unallocated loss expense reserve
      iii) Incurred but not reported loss reserve

2. (a) Give a brief summary of subdivision 2 of Section 326 of the New York Insurance Law concerning reserves for outstanding losses and loss expenses for lines of insurance other than Liability and Workmen's Compensation.

   (b) Under what circumstances may the provisions of subdivision 2 of Section 326 be modified?

3. (a) Describe three methods of testing the adequacy of case reserves prospectively.

   (b) A 1948 amendment to the New York Workmen's Compensation Law provides that the maximum monthly wage to be used in computing death benefits shall be increased to $227.50. In addition, the percentages payable to dependents are increased in the case of children, widow without children, orphans, parents, brothers and sisters, grandparents and grandchildren. Discuss the effect of this law on Special Bulletin No. 207 and outline the necessary steps to be taken.

4. (a) What is the "equity" in the unearned premium reserve and what is its approximate size for a multiple line casualty company?

(b) What effect does the change in the "equity" in the unearned premium reserve have on the "true" surplus of an insurance company during a period of rising premium volume?

5. (a) Discuss the advantages and disadvantages of statistics on a calendar year written-paid basis, a calendar year earned-incurred basis and a policy year basis for:

   i) Automobile Bodily Injury liability insurance

   ii) Glass insurance

(b) Why is the method used in Automobile rate making for developing policy year experience reported as of twelve months to an ultimate basis not suitable for Workmen's Compensation rate making?

6. (a) What type of experience is the Burglary, Theft and Robbery Statistical Plan, which became effective on January 1, 1948, designed to develop? Explain briefly how the desired results can be obtained from the information required by the plan.

(b) A casualty company doing a nationwide business decides to make a classification and size of risk analysis of its Workmen's Compensation experience by punching the unit report information. Design the necessary premium and loss cards and make such comments as you believe essential to describe the method that should be followed.

7. The current high level of wages is being given considerable attention by state supervisory authorities in their consideration of proposed rate revisions for Workmen's Compensation. What external statistics are available on this point and do you believe they provide an adequate answer? Discuss.

8. (a) Demonstrate that the number of accidents in casualty insurance is distributed in accordance with the Poisson Distribution.

(b) Describe briefly a method that might be used to test classification relativities.

PART IV

May 12, 1948 *Time 1:30 to 4:30 o'clock*

1. (a) In order to prepare the Casualty Insurance Expense Exhibit, how would you allocate the following expenses by line of insurance for a small casualty company?
   - (i) Inspection
   - (ii) Allocated Claim Expense
   - (iii) Unallocated Claim Expense
   - (iv) Individual Risk Rating
   - (v) Policy Writing

   (b) Outline briefly a method of handling premium collections on punch cards.

2. From the following data taken from the records of a casualty insurance company, prepare the income and disbursement pages of the annual statement blank of the National Association of Insurance Commissioners. The information given refers to transactions in 1947 and assets and liabilities as of December 31, 1947. In your answer you may use the number of each item rather than the description to conserve time:

1. Net premiums written	\$ 60,000,000
2. Interest, dividends and real estate income	3,000,000
3. Gross profit on sale of ledger assets	100,000
4. Gross increase by adjustment in book value of ledger assets	20,000
5. Losses paid	20,000,000
6. Paid for investigation and adjustment of claims	6,000,000
7. Underwriting expenses paid (prior to deduction of ⅛ of 1% of mean invested assets)	23,090,000
8. ⅛ of 1% of mean invested assets	90,000
9. Investment expenses paid	200,000
10. Dividends to stockholders	1,000,000
11. Gross loss on sale of ledger assets	50,000
12. Gross decrease by adjustment in book value of ledger assets	500,000

13.	Book value of real estate	2,000,000
14.	Book value of bonds	69,000,000
15.	Book value of stocks	20,000,000
16.	Cash	7,800,000
17.	Premiums in course of collection less than 90 days due	10,000,000
18.	Premiums in course of collection over 90 days due 12/31/47	100,000
19.	Interest, dividends and rent accrued 12/31/47	200,000
20.	Market value of stocks over book value 12/31/47	1,000,000
21.	Book value of bonds over amortized value 12/31/47	200,000
22.	Reserve for losses 12/31/47	40,000,000
23.	Reserve for investigation and adjustment of claims 12/31/47	1,000,000
24.	Reserve for unearned premiums 12/31/47	30,000,000
25.	Underwriting expenses unpaid 12/31/47	4,000,000
26.	Capital 12/31/47	5,000,000
27.	Surplus 12/31/47	29,800,000
28.	Unearned premiums 12/31/46	25,000,000
29.	Unpaid losses 12/31/46	35,000,000
30.	Unpaid loss expense 12/31/46	900,000
31.	Unpaid underwriting expense 12/31/46	3,500,000
32.	Interest, dividends and rents accrued 12/31/46	300,000
33.	Market value of stocks over book value 12/31/46	1,500,000
34.	Surplus 12/31/46	28,770,000
35.	Capital 12/31/46	5,000,000
36.	Ledger assets (as per balance) 12/31/46	96,620,000
37.	Premiums in course of collection over 90 days due 12/31/46	150,000
38.	Book value of bonds over amortized value 12/31/46	100,000

3. Make use of the information provided in question 2 to prepare the assets and liabilities pages of the annual statement blank of the National Association of Insurance Commissioners. Again use item numbers instead of descriptions to conserve time.

4. Make use of the information provided in question 2 to prepare the underwriting and investment exhibit of the annual statement blank of the National Association of Insurance Commissioners. Again use item numbers instead of descriptions to conserve time.

5. Discuss the problems involved in creating an Assigned Risk Plan for Automobile Bodily Injury and Property Damage Liability Insurance and include an indication of the various types of applicants for this coverage.

6. The Workmen's Compensation rate-making procedure is frequently criticized because it does not key the rates to an up-to-date level of experience. Could this defect be remedied by keying to the latest one or two calendar years' experience? Discuss.

7. Expenses for most lines of casualty insurance are included in the rates as a percentage of the rate. Is this theoretically correct? What items of expense would it be better to load in another manner? Discuss.

8. A casualty company writing a large volume of Automobile business had had a decrease in the average outstanding amount of Automobile Bodily Injury claims at December 31, 1947 as compared with December 31, 1946, but little change in the number. Having in mind the effect of inflation on the cost of claims, the company wishes to determine the reason for the situation, fearing that the level of reserves on this line may be inadequate. Outline the investigation you think should be made.

INDEX TO VOLUME XXXIV

CASUALTY ACTUARIAL SOCIETY

ORGANIZED 1914

1948 YEAR BOOK

(Addendum to Volume XXXIV of the *Proceedings*)

Corrected to February 1, 1948 No. 27

FOREWORD

The Casualty Actuarial Society was organized November 7, 1914 as the Casualty Actuarial and Statistical Society of America, with 97 charter members of the grade of Fellow. The present title was adopted on May 14, 1921. The object of the Society is the promotion of actuarial and statistical science as applied to the problems of casualty and social insurance by means of personal intercourse, the presentation and discussion of appropriate papers, the collection of a library and such other means as may be found desirable.

Prior to 1914 little technical study was given to the actuarial and underwriting problems of most of the branches of casualty insurance. The organization of the Society was brought about through the suggestion of Dr. I. M. Rubinow, who became the first president. The problems surrounding workmen's compensation were at that time the most urgent, and consequently many of the members played a leading part in the development of the scientific basis upon which workmen's compensation insurance now rests.

The members of the Society have also presented original papers to the *Proceedings* upon the scientific formulation of standards for the computation of both rates and reserves in accident and health insurance, liability, burglary, and the various automobile coverages. The presidential addresses constitute a valuable record of the current problems facing the casualty insurance business. Other papers in the *Proceedings* deal with acquisition costs, pension funds, legal decisions, investments, claims, reinsurance, accounting, statutory requirements, loss reserves, statistics, and the examination of casualty companies. The Committee on Compensation and Liability Loss Reserves submitted a report which has been printed in *Proceedings* No. 35 and No. 36. The Committee on Remarriage Table submitted a report including tables, printed in *Proceedings* No. 40. The Special Committee on Bases of Exposure submitted a report which is printed in *Proceedings* No. 43. "The Recommendations for Study" will appear in *Proceedings* No. 64 and are in effect for the 1948 examinations. The Report of the Committee on Mortality for Disabled Lives together with commutation tables and life annuities has been printed in *Proceedings* No. 62.

The lower grade of membership in the Society is that of Associate. Examinations have been held every year since organization; they are held on the second Tuesday and following Wednesday during the month of 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 282, consisting of 155 Fellows and 127 Associates. The annual meeting of the Society is held in New York in November.

The Society issues a publication entitled the *Proceedings* which contains original papers presented at the meetings. The *Proceedings* also contain discussions of papers, reviews of books and current notes. This Year Book is published annually and "Recommendations for Study" is a pamphlet which outlines the course of study to be followed in connection with the examinations for admission. These two booklets may be obtained free upon application to the Secretary-Treasurer, 90 John Street, New York 7, N. Y.

CASUALTY ACTUARIAL SOCIETY

NOVEMBER 14, 1947

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	GEORGE B. ELLIOTT	1950
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* Terms expire at the annual meeting in November 1948.

† Terms expire at the annual meeting in November of the year given.

COMMITTEES

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MEMBERSHIP OF THE SOCIETY, NOVEMBER 14, 1947

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.

Admitted	
*Nov. 21, 1930	AINLEY, JOHN W., Supervising Underwriter, The Travelers Insurance Company, 700 Main Street, Hartford 15, Conn.
*Nov. 14, 1947	ALLEN, EDWARD S., Rate Analyst (Casualty), Connecticut Insurance Department, Hartford 2, Conn.
*Nov. 13, 1931	AULT, GILBERT E., Actuary, Church Pension Fund and Church Life Insurance Corporation, 20 Exchange Place, New York 5, N. Y.
May 23, 1924	BAILEY, WILLIAM B., (Retired), 52 West Hill Drive, West Hartford, Conn.
*Nov. 20, 1924	BARBER, HARMON T., Associate Actuary, Casualty Department, The Travelers Insurance Co., 700 Main Street, Hartford 15, Conn.
*Nov. 14, 1947	BARKER, LORING M., Firemen's Fund Indemnity Company, 401 California Street, San Francisco 20, Calif.
*Nov. 20, 1942	BART, ROBERT D., West Bend Aluminum Co., West Bend, Wis.
*Nov. 18, 1932	BARTER, JOHN L., Vice-President, Hartford Accident & Indemnity Co., Hartford 15, Conn.
*Nov. 13, 1931	BATHO, ELGIN R., Assistant Actuary, Berkshire Life Insurance Co., Pittsfield, Mass.
†	BENJAMIN, ROLAND, Treasurer, Fidelity & Deposit Company of Maryland and American Bonding Company, Baltimore 3, Md.
*Nov. 22, 1934	BERKELEY, ERNEST T., Actuary, Employers Liability Assurance Corporation and American Employers Insurance Company, Boston 7, Mass.
†	BLACK, S. BRUCE, President, Liberty Mutual Insurance Company, 175 Berkeley Street, Boston 17, Mass.
Apr. 20, 1917	BLANCHARD, RALPH H., Professor of Insurance, School of Business, Columbia University, New York 27, N. Y.
†	BREIBY, WILLIAM, Vice-President, Pacific Mutual Life Insurance Company, Los Angeles 55, Cal.
*Nov. 18, 1927	BROWN, F. STUART, Assistant to Vice-President, Bankers Indemnity Insurance Company, 15 Washington Street, Newark 2, N. J.
Oct. 22, 1915	BROWN, HERBERT D., (Retired), Glenora, Yates County, New York.

FELLOWS

Admitted	
†	Buck, George B., Consulting Actuary for Pension Funds, 150 Nassau Street, New York 7, N. Y.
Apr. 20, 1917	Burhop, William H., Executive Vice-President, Employers Mutual Liability Insurance Company, Wausau, Wis.
*Nov. 23, 1928	Burling, William H., Assistant Actuary, The Travelers Insurance Company, 700 Main Street, Hartford 15, Conn.
*Nov. 19, 1929	Cahill, James M., Secretary, National Bureau of Casualty Underwriters, 60 John Street, New York 7, N. Y.
*Nov. 18, 1932	Cameron, Freeland R., Executive Vice-President and General Manager, Public National Insurance Co., Miami Beach, Florida.
†	Cammack, Edmund E., Vice-President and Actuary, Aetna Life Insurance Company, Hartford 15, Conn.
*Nov. 17, 1938	Carleton, John W., Assistant Actuary, Liberty Mutual Insurance Company, 175 Berkeley Street, Boston 17, Mass.
*Nov. 21, 1930	Carlson, Thomas O., Actuary, National Bureau of Casualty Underwriters, 60 John Street, New York 7, N. Y.
*Mar. 20, 1941	Carver, Harry C., Professor of Mathematics, University of Michigan, Ann Arbor, Michigan.
*Nov. 13, 1936	Cleary, Arthur E., Midston House, 22 East 38th Street, New York 17, N. Y.
*Nov. 15, 1918	Coates, Barrett N., Coates and Herfurth, Consulting Actuaries, 620 Market Street, San Francisco 4, Calif.
*Nov. 17, 1922	Coates, Clarence S., Third Vice-President, Lumbermens Mutual Casualty Company, Mutual Insurance Bldg., Chicago 40, Ill.
Oct. 27, 1916	Cogswell, Edmund S., First Deputy Commissioner of Insurance, 100 Nashua Street, Boston 14, Mass.
Feb. 19, 1915	Collins, Henry, (Retired), Timberlane, Route 4, Easton, Md.
*Nov. 23, 1928	Comstock, W. Phillips, Statistician, London Guarantee & Accident Company, 55 Fifth Avenue, New York 3, N. Y.
*Nov. 22, 1934	Constable, William J., Resident Vice-President, Lumbermens Mutual Casualty Company, 260 Tremont Street, Boston, Mass.
*Nov. 22, 1934	Cook, Edwin A., Assistant General Manager and Secretary, Interboro Mutual Indemnity Insurance Company, 270 Madison Avenue, New York 16, N. Y.
†	Copeland, John A., Consulting Actuary, Candler Building, Atlanta, Ga.
*Nov. 18, 1925	Corcoran, William M., Consulting Actuary, Wolfe, Corcoran & Linder, 116 John Street, New York 7, N. Y.
*Nov. 19, 1926	Crane, Howard G., Vice-President and Treasurer, General Reinsurance Corporation, and North Star Reinsurance Corporation, 90 John Street, New York 7, N. Y.
*Nov. 22, 1946	Crouse, Charles W., Actuary, Manufacturers Casualty Insurance Company, 16th St. and Pennsylvania Boulevard, Philadelphia 3, Pa.

FELLOWS

Admitted	
*Nov. 18, 1932	DAVIES, E. ALFRED, Associate Comptroller, Liberty Mutual Insurance Company, 175 Berkeley Street, Boston 17, Mass.
*Nov. 18, 1927	DAVIS, EVELYN M., Woodward, Ryan, Sharp & Davis, Consulting Actuaries, 41 Park Row, New York 7, N. Y.
†	DEKAY, ECKFORD C., President, DeKay & Company, 84 William Street, New York 7, N. Y.
*Nov. 17, 1920	DORWEILER, PAUL, Actuary, Aetna Casualty & Surety Company, Hartford 15, Conn.
*Nov. 24, 1933	EDWARDS, JOHN, Casualty Actuary, Ontario Insurance Department, 91 Arundel Avenue, Toronto 6, Ontario, Canada.
*Nov. 15, 1940	ELLIOTT, GEORGE B., Chief Actuary, Bureau of Rate Regulation, Pennsylvania Insurance Department, 134 South 4th Street, Philadelphia, Pa.
*Nov. 17, 1922	ELSTON, JAMES S., Assistant Actuary, Life Department, The Travelers Insurance Co., 700 Main Street, Hartford 15, Conn.
*Nov. 15, 1935	EPPINK, WALTER T., Vice-President, Merchants Mutual Casualty Co., Merchants Mutual Building, Buffalo 5, New York.
†	FACKLER, EDWARD B., Consulting Actuary, Fackler & Company, 8 West 40th Street, New York 18, N. Y.
†	FALLOW, EVERETT S., Actuary, Accident Department, The Travelers Insurance Co., 700 Main Street, Hartford 15, Conn.
*Nov. 15, 1940	FARLEY, JARVIS, Actuary and Asst. Treasurer, Massachusetts Indemnity Co., 632 Beacon Street, Boston 15, Mass.
†	FARRER, HENRY, Insurance Company of North America, 99 John Street, New York 7, N. Y.
*Nov. 15, 1935	FITZHUGH, GILBERT W., Third Vice-President, Metropolitan Life Insurance Co., 1 Madison Avenue, New York 10, N. Y.
Feb. 19, 1915	FONDILLER, RICHARD, Woodward and Fondiller, Consulting Actuaries, 90 John Street, New York 7, N. Y.
†	FRANKLIN, CHARLES H., (Retired), 6225 Princeton Way, Hawthorne Hills, Seattle, Washington.
*Nov. 18, 1927	FREDRICKSON, CARL H., Actuary, Canadian Underwriters Association, 55 York Street, Toronto, Canada.
*Nov. 22, 1934	FULLER, GARDNER V., Manager, Special Risk Department, Lumbermens Mutual Casualty Co., Mutual Insurance Bldg., Chicago 40, Ill.
Feb. 19, 1915	GARRISON, FRED S., Secretary, The Travelers Indemnity Co., 700 Main Street, Hartford 15, Conn.
*Nov. 20, 1924	GINSBURGH, HAROLD J., Vice-President, American Mutual Liability Insurance Co., 142 Berkeley Street, Boston 16, Mass.
*Nov. 21, 1930	GLENN, J. BRYAN, 5214 First Street, N.W., Washington 11, D.C.
*Nov. 13, 1931	GODDARD, RUSSELL P., Assistant Actuary, American Mutual Liability Insurance Company, 142 Berkeley Street, Boston 16, Mass.

FELLOWS

Admitted	
†	Goodwin, Edward S., 750 Main Street, Hartford 3, Conn.
*Nov. 19, 1926	Graham, Charles M., Chief Self-Insurance Examiner, Workmen's Compensation Board of N. Y., 80 Center Street, New York 13, N. Y.
†	Graham, William J., Vice-President, Equitable Life Assurance Society, 393 Seventh Avenue, New York 1, N. Y.
†	Greene, Winfield W., Executive Vice-President, General Reinsurance Corporation and North Star Reinsurance Corporation, 90 John Street, New York 7, N. Y.
†	Hammond, H. Pierson, (Retired), 22 Vanderbilt Road, West Hartford, Conn.
Oct. 27, 1916	Hardy, Edward R., Secretary-Emeritus, Insurance Institute of America, Inc., 80 John Street, New York 7, N. Y.
Oct. 22, 1915	Hatch, Leonard W., (Retired), 425 Pelham Manor Road, Pelham Manor, New York.
*Nov. 19, 1926	Haugh, Charles J., Secretary, Compensation and Liability Dept., The Travelers Insurance Co., Hartford 15, Conn.
Oct. 22, 1915	Hodgkins, Lemuel G., (Retired), 5 Whitman Road, Worcester 5, Mass.
Oct. 22, 1915	Holland, Charles H., Suite 2001, 165 Broadway, New York 6, N. Y.
*Nov. 22, 1934	Hooker, Russell O., Actuary, Connecticut Insurance Department, Hartford 2, Conn.
Nov. 18, 1932	Huebner, Solomon S., Professor of Insurance, University of Pennsylvania, Philadelphia 4, Pa.
†	Hughes, Charles, (Retired), 285 Smith St., Freeport, N. Y.
*Nov. 14, 1947	Hughey, M. Stanley, Lumbermens Mutual Casualty Company, Mutual Insurance Building, Chicago 40, Ill.
Nov. 19, 1929	Hull, Robert S., (Deceased November 30, 1947).
†	Hunter, Arthur, (Retired), 124 Lloyd Road, Montclair, N. J.
Feb. 25, 1916	Jackson, Charles W., 74 Quimby Avenue, White Plains, N. Y.
*Nov. 19, 1929	Jackson, Henry H., Vice-President & Actuary, National Life Insurance Co., Montpelier, Vt.
*Nov. 14, 1941	Johnson, Roger A., Actuary, Compensation Insurance Rating Board, 125 Park Avenue, New York 17, N. Y.
*Nov. 16, 1939	Jones, Harold M., John Hancock Mutual Life Insurance Company, Boston 17, Mass.
*Nov. 17, 1938	Kardonsky, Elsie, 66 Corbin Place, Brooklyn 29, N. Y.
Nov. 17, 1938	Kelly, Gregory C., General Manager, Pennsylvania Compensation Rating & Inspection Bureau, 938 Public Ledger Bldg., Philadelphia 6, Pa.
*Nov. 19, 1926	Kelton, William H., Associate Actuary, Life Department, The Travelers Insurance Co., 700 Main Street, Hartford 15, Conn.

FELLOWS

Admitted	
*Nov. 21, 1919	KIRKPATRICK, A. LOOMIS, Manager Insurance Department, Chamber of Commerce of the U. S. A., 1615 H Street, N.W., Washington 6, D. C.
*Nov. 14, 1941	KOLODITZKY, MORRIS, Associate Actuary, State Insurance Fund, 625 Madison Avenue, New York 22, N. Y.
*Nov. 24, 1933	KORMES, MARK, Consulting Actuary, 285 Madison Avenue, New York 17, N. Y.
Nov. 23, 1928	KULP, CLARENCE A., Professor of Insurance, University of Pennsylvania, Logan Hall, 36th Street and Woodland Avenue, Philadelphia 4, Pa.
Nov. 13, 1931	LA MONT, STEWART M., (Retired), Hotel Claremont, Berkeley, Cal.
*Nov. 24, 1933	LANGE, JOHN R., Chief Actuary, Wisconsin Insurance Department, State House, Madison 3, Wis.
†	LEAL, JAMES R., Vice-President and Secretary, Interstate Life and Accident Co., Interstate Building, 540 McCallie Avenue, Chattanooga 3, Tenn.
†	LESLIE, WILLIAM, General Manager, National Bureau of Casualty Underwriters, 60 John Street, New York 7, N. Y.
*Nov. 20, 1924	LINDER, JOSEPH, Consulting Actuary, Wolfe, Corcoran & Linder, 116 John Street, New York 7, N. Y.
*Nov. 13, 1936	LYONS, DANIEL J., Associate Actuary, Guardian Life Insurance Co., 50 Union Square, New York 3, N. Y.
†	MAGOUN, WILLIAM N., (Retired), 33 Fearing Road, Hingham, Mass.
*Nov. 23, 1928	MARSHALL, RALPH M., Assistant Actuary, National Council on Compensation Insurance, 45 East 17th Street, New York 3, N. Y.
*Nov. 18, 1927	MASTERSON, NORTON E., Vice-President and Actuary, Hardware Mutual Casualty Co. and Hardware Dealers Mutual Fire Insurance Co., Stevens Point, Wis.
*Nov. 19, 1926	MATTHEWS, ARTHUR N., Asst. Actuary, Casualty Department, The Travelers Insurance Co., 700 Main Street, Hartford 15, Conn.
May 19, 1915	MAYCRINK, EMMA C., Secretary-Treasurer, Association of New York State Mutual Casualty Companies, 60 East 42nd Street, New York 17, N. Y.
*Nov. 15, 1935	McCONNELL, MATTHEW H., Underwriter, Employers Mutual Liability Ins. Co., 12 S. 12th Street, Philadelphia 7, Pa.
*Oct. 31, 1917	McMANUS, ROBERT J., Statistician, Casualty Department, The Travelers Insurance Co., 700 Main Street, Hartford 15, Conn.
†	MICHELBACHER, GUSTAV F., President, Great American Indemnity Co., 1 Liberty Street, New York 5, N. Y.
*Nov. 17, 1938	MILLER, JOHN H., Vice-President and Actuary, Monarch Life Insurance Company, Springfield, Mass.
†	MILLIGAN, SAMUEL, Vice-President, Metropolitan Life Insurance Co., 1 Madison Avenue, New York 10, N. Y.
*Nov. 18, 1937	MILLS, JOHN A., Vice-President and Actuary, Lumbermens Mutual Casualty Co. and American Motorists Insurance Co., Mutual Insurance Bldg., Chicago 40, Ill.

FELLOWS

Admitted	
*Nov. 18, 1921	MONTGOMERY, VICTOR, President, Pacific Employers Insurance Co., 1033 So. Hope Street, Los Angeles 15, Calif.
Nov. 19, 1926	MOONEY, WILLIAM L., (Retired), 47 Pleasant Street, West Hartford 7, Conn.
†	MOORE, GEORGE D., Actuary, National Association of Insurance Agents, 80 Maiden Lane, New York 7, N. Y.
†	MOWBRAY, ALBERT H., Consulting Actuary, 806 San Luis Road, Berkeley 7, Calif.
*Nov. 17, 1920	MUELLER, LOUIS H., 740 El Camino Del Mar, San Francisco 21, Calif.
†	MULLANEY, FRANK R., Vice-President and Secretary, American Mutual Liability Insurance Co., and American Policyholders' Insurance Co., and Vice-President, Allied American Mutual Fire Insurance Co., 142 Berkeley Street, Boston 16, Mass.
May 28, 1920	MURPHY, RAY D., Vice-President and Actuary, Equitable Life Assurance Society, 393 Seventh Avenue, New York 1, N. Y.
*Nov. 15, 1935	OBERHAUS, THOMAS M., Consulting Actuary, Woodward and Fondiller, 90 John Street, New York 7, N. Y.
†	OLIFIERS, EDWARD, Consulting Actuary, Caixa Postal 8 Pertopolis, Rio, Brazil.
†	ORR, ROBERT K., 226 S. Logan Street, Lansing, Mich.
*Nov. 21, 1919	OUTWATER, OLIVE E., Actuary, Benefit Association of Railway Employees, 901 Montrose Avenue, Chicago 13, Ill.
*Nov. 21, 1930	PERRYMAN, FRANCIS S., Vice-President and Actuary, Eagle Indemnity Co., Globe Indemnity Co. and Royal Indemnity Co., 150 William Street, New York 8, N. Y.
*Nov. 14, 1941	PETERS, STEFAN, 1207 Peralta Avenue, Berkeley 5, Calif.
Nov. 19, 1926	PHILLIPS, JESSE S., Chairman of Board, Great American Indemnity Co., 1 Liberty Street, New York 5, N. Y.
*Nov. 24, 1933	PICKETT, SAMUEL C., Rating Supervisor, Connecticut Insurance Department, Hartford 2, Conn.
*Nov. 17, 1922	PINNEY, SYDNEY D., 290 Wolcott Hill Road, Wethersfield 9, Conn.
*Nov. 13, 1931	PRUITT, DUDLEY M., Actuary, General Accident Fire & Life Assurance Corp., Fourth & Walnut Sts., Philadelphia 5, Pa.
May 23, 1919	RICHARDSON, FREDERICK, Chairman of the Board, General Accident Fire and Life Assurance Corporation, Perth, Scotland.
*Nov. 19, 1926	RICHTER, OTTO C., Actuary, American Telephone & Telegraph Co., 195 Broadway, New York 7, N. Y.
May 24, 1921	RIEGEL, ROBERT, Professor of Statistics and Insurance, University of Buffalo, Buffalo 14, New York.

FELLOWS

Admitted	
*Nov. 14, 1947	RODERMUND, MATTHEW, Actuary and Assistant Comptroller, Interboro Mutual Indemnity Insurance Company, 270 Madison Avenue, New York 16, N. Y.
*Nov. 16, 1923	ROEBER, WILLIAM F., General Manager, National Council on Compensation Insurance, 45 East 17th Street, New York 3, N. Y.
*Nov. 14, 1947	ROSENBERG, NORMAN, Actuary, Public Service Mutual Insurance Company, 342 Madison Avenue, New York 17, N. Y.
*Nov. 17, 1943	ROSS, SAMUEL M., Asst. Actuary, National Bureau of Casualty Underwriters, 60 John Street, New York 7, N. Y.
*Nov. 14, 1947	ROWELL, JOHN H., Group Insurance Actuary, Connecticut General Life Insurance Company, Hartford 2, Conn.
*Nov. 14, 1947	SALZMANN, RUTH, Assistant Actuary, Hardware Mutual Casualty Company, Stevens Point, Wisc.
*Nov. 20, 1942	SATTERTHWAITE, FRANKLIN E., General Electric Company, 4110 Bowser Avenue, Fort Wayne, Ind.
*Nov. 18, 1937	SHAPIRO, GEORGE I., First Vice-President and General Manager, Public Service Mutual Insurance Co., 342 Madison Avenue, New York 17, N. Y.
*Nov. 13, 1931	SILVERMAN, DAVID, c/o Wolfe, Corcoran & Linder, 116 John Street, New York 7, N. Y.
*Nov. 24, 1933	SINNOTT, ROBERT V., Assistant Secretary, Hartford Accident and Indemnity Company, 690 Asylum Ave., Hartford 15, Conn.
*Nov. 19, 1929	SKELDING, ALBERT Z., Actuary, National Council on Compensation Insurance, 45 East 17th Street, New York 3, N.Y.
*Nov. 19, 1929	SKILLINGS, E. SHAW, Actuary, Allstate Insurance Co., 20 North Wacker Drive, Chicago 6, Ill.
*Nov. 18, 1932	SMICK, JACK J., Associate Actuary, Woodward and Fondiller, Consulting Actuaries, 90 John Street, New York 7, N. Y.
*Nov. 15, 1940	SMITH, SEYMOUR E., Assistant Secretary, Casualty Department, The Travelers Insurance Co., Hartford 15, Conn.
*Nov. 24, 1933	ST. JOHN, JOHN B., Associate Actuary, Towers, Perrin, Forster & Crosby, Inc., 12 South 12th Street, Philadelphia 7, Pa.
Nov. 18, 1927	STONE, EDWARD C., Chairman of the Board, Employers' Liability Assurance Corporation, Limited, and American Employers' Insurance Company, 110 Milk Street, Boston 7, Mass.
Oct. 22, 1915	STRONG, WILLIAM RICHARD, No. 4 "Sheringham," Cotham Road, Kew, Victoria, Australia.
*Nov. 17, 1920	TARBELL, THOMAS F., Actuary, Casualty Department, The Travelers Insurance Co., 700 Main Street, Hartford 15, Conn.
†	THOMPSON, JOHN S., President, Mutual Benefit Life Insurance Co., 300 Broadway, Newark 4, N. J.
†	TRAIN, JOHN L., President and General Manager, Utica Mutual Insurance Co., 185 Genesee Street, Utica 1, New York.

FELLOWS

Admitted	
Nov. 17, 1922	TRAVERSI, ANTONIO T., Consulting Actuary and Accountant, Bank of Adelaide Chambers, Margaret St., Sydney, Australia.
*Nov. 14, 1947	UHTHOFF, DUNBAR R., Supervisor Actuarial Department, National Council on Compensation Insurance, 45 East 17th Street, New York 3, N. Y.
*Nov. 23, 1928	VALERIUS, NELS M., Assistant Actuary, Aetna Casualty and Surety Co., Hartford 15, Conn.
*Nov. 21, 1919	VAN TUYL, HIRAM O., Supt., Accounts Department, London Guarantee & Accident Co., 55 Fifth Avenue, New York 3, N. Y.
*Nov. 17, 1920	WAITE, ALAN W., Secretary, Aetna Casualty and Surety Co., Hartford 15, Conn.
*Nov. 15, 1935	WAITE, HARRY V., Actuary, The Travelers Fire Insurance Co., 700 Main Street, Hartford 15, Conn.
*Nov. 18, 1925	WARREN, LLOYD A. H., Professor of Actuarial Science, University of Manitoba, 64 Niagara Street, Winnipeg, Manitoba, Canada.
*Nov. 14, 1947	WIEDER, JOHN W., JR., Aetna Casualty and Surety Company, Hartford 15, Conn.
*Nov. 15, 1935	WILLIAMS, HARRY V., Assistant Secretary, Hartford Accident and Indemnity Co., Hartford 15, Conn.
Nov. 14, 1941	WILLIAMSON, WILLIAM R., President, The Wyatt Company, 1029 Vermont Avenue, N.W., Washington 5, D. C.
*Nov. 13, 1931	WITTICK, HERBERT E., Secretary, Pilot Insurance Co., 199 Bay Street, Toronto, Canada.
†	WOLFE, LEE J., Consulting Actuary, Wolfe, Corcoran & Linder, 116 John Street, New York 7, N. Y.
May 24, 1921	WOOD, ARTHUR B., President and Managing Director, Sun Life Assurance Company of Canada, Montreal, Canada.

ASSOCIATES

Those marked (*) have been enrolled as Associates upon examination by the Society.

Admitted	
May 23, 1924	ACKER, MILTON, Manager, Compensation and Liability Division, National Bureau of Casualty Underwriters, 60 John Street, New York 7, N. Y.
*Nov. 15, 1918	ACKERMAN, SAUL B., Professor of Insurance, New York University, 90 Trinity Place, New York 6, N. Y.
*Nov. 16, 1939	AIN, SAMUEL N., Pension Trust Division, Bureau of Internal Revenue, Washington, 25, D. C.
Apr. 5, 1928	ALLEN, AUSTIN F., President and General Manager, Texas Employers Insurance Association and Employers Casualty Co., Dallas 1, Texas.
Nov. 15, 1918	ANKERS, ROBERT E., Secretary and Treasurer, Continental Life Insurance Co., Investment Building, Washington 5, D.C.
*Nov. 21, 1930	ARCHIBALD, A. EDWARD, Vice-President and Actuary, Volunteer State Life Insurance Company, Chattanooga 1, Tenn.
*Nov. 16, 1939	BAILEY, ARTHUR L., Chief Actuary, Rating Bureau, State Insurance Department, 61 Broadway, New York 6, N. Y.
*Nov. 24, 1933	BARRON, JAMES C., Asst. Treasurer, General Reinsurance Corporation, 90 John Street, New York 7, N. Y.
*Nov. 23, 1928	BATEMAN, ARTHUR E., 121 Raymond Street, Cambridge, Mass.
*Nov. 15, 1940	BATHO, BRUCE, Associate Actuary, Life Insurance Company of Georgia, Atlanta 1, Georgia.
*Nov. 18, 1925	BITTEL, W. HAROLD, Chief Actuary, Department of Banking and Insurance, Trenton 7, New Jersey.
Nov. 17, 1920	BLACK, NELLAS C., Manager, Statistical Department, Maryland Casualty Co., Baltimore 3, Md.
*Nov. 15, 1940	BLACKHALL, JOHN M., California Western States Life Insurance Company, Sacramento, Calif.
*Nov. 22, 1934	BOMSE, EDWARD L., Supt. New York Met. Special Risks, Royal Indemnity Co., 150 William Street, New York 8, N. Y.
*Nov. 23, 1928	BOWER, PERRY S., Great West Life Assurance Company, Winnipeg, Manitoba, Canada.
*Nov. 15, 1918	BRUNNQUELL, HELMUTH G., Assistant Actuary, The Northwestern Mutual Life Insurance Co., Milwaukee 2, Wis.
*Oct. 22, 1915	BUFFLER, LOUIS, Director, Underwriting Department, State Insurance Fund, 625 Madison Avenue, New York 22, N. Y.
*Nov. 20, 1924	BUGBEE, JAMES M., Manager, Automobile Department, Maryland Casualty Co., Baltimore 3, Md.
Mar. 31, 1920	BURT, MARGARET A., Office of George B. Buck, Consulting Actuary, 150 Nassau Street, New York 7, N. Y.
Nov. 17, 1922	CAVANAUGH, LEO D., President, Federal Life Insurance Co., 168 N. Michigan Avenue, Chicago 1, Ill.
*Nov. 18, 1927	CHEN, S. T., Actuary, China United Assurance Society, 104 Bubbling Well Road, Shanghai, China.
*Nov. 14, 1947	CLARK, JOHN W., Casualty Actuarial Department, Travelers Insurance Company, 700 Main Street, Hartford 15, Conn.

ASSOCIATES

Admitted	
*Nov. 18, 1927	CONROD, STUART F., Actuary and Assistant Treasurer, Loyal Protective Life Insurance Co., 19 Deerfield Street, Boston 15, Mass.
*Nov. 24, 1933	CRAWFORD, WILLIAM H., Secretary, Fireman's Insurance Co. of Newark, N. J. & Affiliated Fire & Casualty Co.'s Pacific Dept., 220 Bush Street, San Francisco 4, Cal.
*Nov. 18, 1932	CRIMMINS, JOSEPH B., Assistant Actuary, Metropolitan Life Insurance Co., 1 Madison Avenue, New York 10, N. Y.
*Nov. 18, 1925	DAVIS, MALVIN E., Actuary, Metropolitan Life Insurance Co., 1 Madison Avenue, New York 10, N. Y.
*Nov. 24, 1933	DAVIS, REGINALD S., Assistant Commissioner, Division of Real Estate, State of California, 1020 N Street, Sacramento, Calif.
*Nov. 14, 1941	DOWLING, WILLIAM F., Asst. Treasurer, Lumber Mutual Casualty Co., 41 E. 42nd Street, New York 17, N. Y.
May 25, 1923	ECONOMIDY, HARILAUS E., 1817 Center Street, Galveston, Texas.
June 5, 1925	EGER, FRANK A., Secretary, Indemnity Insurance Co. of North America, 1600 Arch Street, Philadelphia 3, Pa.
*Nov. 16, 1923	FITZ, L. LEROY, Group Department, John Hancock Mutual Life Insurance Company, Boston 17, Mass.
*Nov. 16, 1923	FLEMING, FRANK A., Actuary, General Manager, Mutual Casualty Rating Bureau, 60 East 42nd Street, New York 17, N. Y.
Nov. 20, 1924	FROBERG, JOHN, Manager, California Inspection Rating Bureau, 500 Sansome Street, San Francisco 11, Calif.
*Nov. 13, 1936	FRUECHTEMEYER, FRED J., Accountant, Andrew Jergens Company, Cincinnati, Ohio.
*Nov. 19, 1929	FURNIVALL, MAURICE L., Assistant Actuary, Accident Department, The Travelers Insurance Co., 700 Main Street, Hartford 15, Conn.
*Nov. 14, 1947	GARDINER, JAMES B., Metropolitan Life Insurance Co., 1 Madison Avenue, New York 10, N. Y.
*Nov. 14, 1947	GEORGE, J. H., Assistant Actuary, National Life Insurance Co., Montpelier, Vt.
*Nov. 18, 1932	GETMAN, RICHARD A., Life Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford 15, Conn.
*Nov. 17, 1922	GIBSON, JOSEPH P., JR., Vice President, and General Manager, Excess Insurance Company of America, 99 John Street, New York 7, N. Y.
*Nov. 16, 1923	GILDEA, JAMES F., The Travelers Insurance Co., 700 Main Street, Hartford 15, Conn.
*Nov. 14, 1947	GINGERY, STANLEY W., Acting Supervisor, The Prudential Insurance Co., Newark, N. J.
Nov. 19, 1929	GORDON, HAROLD R., Managing Director, Health & Accident Underwriters Conference, 176 West Adams Street, Chicago 3, Ill.
*Nov. 18, 1927	GREEN, WALTER C., Consulting Actuary, 211 West Wacker Drive, Chicago 6, Ill.
*Nov. 15, 1940	GROSSMAN, ELI A., Administrator (Actuarial), United States Life Insurance Co., 84 William St., New York 7, N. Y.

ASSOCIATES

Admitted	
*Nov. 15, 1935	GUERTIN, ALFRED N., Actuary, American Life Convention, 230 N. Michigan Ave., Chicago 1, Ill.
*Nov. 16, 1939	HAGEN, OLAF E., Metropolitan Life Insurance Company, 1 Madison Avenue, New York 10, N. Y.
*Nov. 18, 1921	HAGGARD, ROBERT E., Supervisor, Permanent Disability Rating Bureau, Industrial Accident Commission, 965 Mission Street, San Francisco 3, Calif.
*Nov. 17, 1922	HALL, HARTWELL L., Associate Actuary, Connecticut Insurance Department, Hartford 2, Conn.
*Nov. 13, 1936	HAM, HUGH P., Assistant General Manager, Western Assurance Company, Toronto, Canada.
Mar. 24, 1932	HARRIS, SCOTT, Vice-President, Joseph Froggatt & Co., 74 Trinity Place, New York 6, N. Y.
*Mar. 25, 1924	HART, WARD VAN BUREN, Assistant Actuary, Connecticut General Life Insurance Co., Hartford 2, Conn.
Nov. 21, 1919	HAYDON, GEORGE F., General Manager, Wisconsin Compensation Rating & Inspection Bureau, 715 N. Van Buren Street, Milwaukee 2, Wis.
Nov. 17, 1927	HIPP, GRADY H., Executive Vice-President, Liberty Life Insurance Co., Greenville, S. C.
*Nov. 16, 1945	HOLZINGER, ERNEST, Actuary, Pension Planning Company, 527 Fifth Avenue, New York 17, N. Y.
Nov. 19, 1929	JACOBS, CARL N., President, Hardware Mutual Casualty Co., Stevens Point, Wis.
*Nov. 18, 1921	JENSEN, EDWARD S., Supt., Group Department, Occidental Life Insurance Co., Los Angeles 55, Calif.
Nov. 21, 1930	JONES, H. LLOYD, Deputy General Attorney, of Phoenix-London Group, Vice-President, Phoenix Indemnity Company, and Deputy United States Manager, London Accident & Guarantee Co., 55 Fifth Avenue, New York 3, N. Y.
*Nov. 21, 1919	JONES, LORING D., (Retired) 64 Raymond Ave., Rockville Centre, Long Island, N. Y.
*Nov. 15, 1940	KELLY, ROBERT G., 2127 California St., Washington 8, D. C.
*Nov. 17, 1922	KIRK, CARL L., Assistant U. S. Manager, Zurich General Accident & Liability Insurance Co., 135 South LaSalle Street, Chicago 3, Ill.
*Nov. 15, 1935	KITZROW, ERWIN W., Vice-President, Hardware Mutual Casualty Co., Stevens Point, Wis.
*Nov. 16, 1939	KNOWLES, FREDERICK, 5724 Mountain Sights Ave., N. D. G., Montreal, Canada.
*Nov. 18, 1937	LASSOW, WILLIAM, 185 206th St., Bronx 58, New York.
*Nov. 17, 1938	LIEBLEIN, JULIUS, 2710-29th Street, S. E., Washington 20, D. C.
*Nov. 14, 1947	LUFKIN, ROBERT W., Liberty Mutual Insurance Co., 175 Berkley Street, Boston, Mass.
*Nov. 13, 1931	MACKEEN, HAROLD E., The Travelers Insurance Co., 700 Main Street, Hartford 15, Conn.
Mar. 24, 1932	MAGRATH, JOSEPH J., Executive Assistant, Chubb & Sons, 90 John Street, New York 7, N. Y.
*Nov. 18, 1925	MALMUTH, JACOB, Examiner, New York Insurance Department, 61 Broadway, New York 6, N. Y.

ASSOCIATES

Admitted	
Mar. 24, 1927	MARSH, CHARLES V. R., (Retired), 3413 Forest Park Avenue, Baltimore 16, Md.
*Nov. 13, 1936	MAYER, WILLIAM H., JR., Actuarial Department, Metropolitan Life Insurance Co., 1 Madison Avenue, New York 10, N. Y.
*Nov. 17, 1922	McIVER, ROSSWELL A., Actuary, Washington National Insurance Co., 610 Church Street, Evanston, Ill.
*Nov. 17, 1922	MICHENER, SAMUEL M., Actuary, Columbus Mutual Life Insurance Co., 303 East Broad Street, Columbus 15, Ohio.
*Nov. 13, 1931	MILLER, HENRY C., Comptroller and Actuary, State Compensation Insurance Fund, 450 McAllister Street, San Francisco 2, Calif.
*Nov. 19, 1926	MILNE, JOHN L., Actuary, Philadelphia Life Insurance Company, 111 North Broad Street, Philadelphia 7, Pa.
Nov. 17, 1922	MONTGOMERY, JOHN C., Secretary and Treasurer, Bankers Indemnity Insurance Co., 15 Washington Street, Newark 2, N. J.
May 25, 1923	MOORE, JOSEPH P., President, North American Accident Insurance Co., 455 Craig Street, W., Montreal, Canada.
*Nov. 21, 1919	MOTHERSILL, ROLLAND V., Chairman of the Board, Anchor Casualty Co., Anchor Insurance Building, 2700 University Avenue, St. Paul 4, Minn.
*Nov. 14, 1947	MUNTERICH, GEORGE C., Lumber Mutual Casualty Insurance Company of New York, 41 East 42nd Street, New York 17, N. Y.
*Nov. 18, 1937	MYERS, ROBERT J., Actuarial Consultant, Social Security Administration, Washington 25, D. C.
*Nov. 15, 1935	NELSON, S. TYLER, Casualty Actuary, Casualty Rating Division, Illinois Insurance Department, Springfield, Ill.
*Oct. 27, 1916	NEWELL, WILLIAM, (Retired), 1225 Park Avenue, New York 28, N. Y.
*Nov. 18, 1925	NICHOLSON, EARL H., Actuary, Joseph Froggatt & Co., 74 Trinity Place, New York 6, N. Y.
May 23, 1919	OTTO, WALTER E., President, Michigan Mutual Liability Co., 163 Madison Avenue, Detroit 26, Mich.
*Nov. 19, 1926	OVERHOLSER, DONALD M., Office of George B. Buck, Consulting Actuary, 150 Nassau Street, New York 7, N. Y.
Nov. 20, 1924	PENNOCK, RICHARD M., Actuary, Pennsylvania Manufacturers' Association Casualty Insurance Co., Finance Building, Philadelphia 2, Pa.
*Nov. 14, 1947	PERRY, ROBERT C., Vice President and Actuary, State Farm Life Insurance Company, Bloomington, Ill.
Nov. 19, 1929	PHILLIPS, JOHN H., Vice-President and Actuary, Employers' Mutual Liability Insurance Co., Wausau, Wis.
*Nov. 17, 1920	PIKE, MORRIS, Associate Actuary, John Hancock Mutual Life Insurance Co., Boston 17, Mass.
*Nov. 23, 1928	PIPER, KENNETH B., Vice-President and Actuary, Provident Life and Accident Insurance Co., Chattanooga 2, Tenn.
*Nov. 17, 1922	POORMAN, WILLIAM F., Vice-President and Actuary, Central Life Assurance Society, Fifth and Grand Avenues, Des Moines 6, Iowa.

ASSOCIATES

Admitted	
*Nov. 13, 1936	POTOFSKY, SYLVIA, Senior Actuary, State Insurance Fund, 625 Madison Avenue, New York 22, N. Y.
Nov. 17, 1922	POWELL, JOHN M., President, Loyal Protective Life Insurance Co., 19 Deerfield Street, Boston 15, Mass.
*Nov. 15, 1918	RAYWID, JOSEPH, President, Joseph Raywid & Co., Inc., 92 William Street, New York 7, N. Y.
Nov. 19, 1932	RICHARDSON, HARRY F., Secretary-Treasurer, National Council on Compensation Insurance, 45 East 17th Street, New York 3, N. Y.
*Nov. 18, 1932	ROBERTS, JAMES A., Life Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford 15, Conn.
*Nov. 18, 1927	SARASON, HARRY M., Associate Actuary, General American Life Insurance Co., 1501 Locust Street, St. Louis 3, Mo.
Nov. 16, 1923	SAWYER, ARTHUR, Globe Indemnity Co., 150 William Street, New York 7, N. Y.
*Nov. 14, 1947	SCAMMON, LAWRENCE W., Actuary, Massachusetts Rating and Inspection Bureau, 89 Broad Street, Boston, Mass.
*Nov. 14, 1947	SCHWARTZ, MAX J., State Insurance Department, Albany 1, N. Y.
*Nov. 20, 1930	SEVILLA, EXEQUIEL S., Manager, National Life Insurance Co., Regina Building, Manila, Philippines.
*Nov. 20, 1924	SHEPPARD, NORRIS E., Professor of Mathematics, University of Toronto, Toronto 5, Canada.
Nov. 15, 1918	SIBLEY, JOHN L., Assistant Secretary, United States Casualty Co., 60 John Street, New York 7, N. Y.
*Nov. 18, 1921	SMITH, ARTHUR G., Assistant General Manager, Compensation Insurance Rating Board, Pershing Square Bldg., 125 Park Avenue, New York 17, N. Y.
*Nov. 19, 1926	SOMERVILLE, WILLIAM F., Secretary, St. Paul Mercury Indemnity Co., St. Paul 2, Minn.
*Nov. 18, 1925	SOMMER, ARMAND, Supt. of Agencies, Continental Casualty Co., 910 So. Michigan Avenue, Chicago 5, Ill.
*Nov. 15, 1918	SPENCER, HAROLD S., Statistician, Aetna Casualty and Surety Co., Hartford 15, Conn.
Nov. 20, 1924	STELLWAGEN, HERBERT P., Executive Vice-President, Indemnity Insurance Company of North America, 1600 Arch Street, Philadelphia 3, Pa.
*Nov. 16, 1923	STOKE, KENDRICK, Actuary, Michigan Mutual Liability Company, 163 Madison Avenue, Detroit 26, Mich.
*Nov. 21, 1930	SULLIVAN, WALTER F., Asst. Actuary, State Compensation Insurance Fund, 450 McAllister Street, San Francisco 2, Calif.
*Nov. 21, 1919	TRENCH, FREDERICK H., Manager, Underwriting Department, Utica Mutual Insurance Co., 185 Genesee Street, Utica 1, N. Y.
*Nov. 14, 1947	TURNER, PAUL A., Assistant Actuary, Joseph Froggath & Co., 74 Trinity Place, New York 6, N. Y.
*Nov. 20, 1924	UHL, M. ELIZABETH, National Bureau of Casualty Underwriters, 60 John Street, New York 7, N. Y.
*Nov. 14, 1947	VERGANO, ELIA, Compensation Insurance Rating Board, 125 Park Avenue, New York 17, N. Y.

ASSOCIATES

Admitted	
May 23, 1919	WARREN, CHARLES S., Secretary, Massachusetts Automobile Rating and Accident Prevention Bureau, 89 Broad Street, Boston 10, Mass.
*Nov. 18, 1932	WEINSTEIN, MAX S., Actuary, New York State Employees' Retirement System, 256 Washington Ave., Albany 1, N. Y.
*Nov. 18, 1925	WELLMAN, ALEXANDER C., Vice-President, Protective Life Insurance Co., Birmingham, Ala.
*Nov. 21, 1930	WELLS, WALTER I., Asst. Actuary, State Mutual Life Assurance Co., Worcester 8, Mass.
Mar. 21, 1929	WHEELER, CHARLES A., Chief Examiner of Casualty Companies, New York Insurance Department, 61 Broadway, New York 6, N. Y.
*Nov. 18, 1927	WHITBREAD, FRANK G., Vice-President, Reliance Life Insurance Company, Pittsburgh, Pa.
*Nov. 16, 1939	WITTLAKE, J. CLARKE, Assistant Actuary, Business Men's Assurance Company, Kansas City 10, Mo.
*Nov. 14, 1947	WOLFRUM, RICHARD J., Actuarial Department, Liberty Mutual Insurance Company, 175 Berkley Street, Boston, Mass.
*Oct. 22, 1915	WOOD, DONALD M., Childs & Wood, General Agents, Royal Indemnity Company, 175 W. Jackson Blvd., Chicago 4, Ill.
*Nov. 18, 1937	WOOD, DONALD M., JR., Childs & Wood, 175 West Jackson Blvd., Chicago 4, Ill.
*Nov. 18, 1927	WOOD, MILTON J., Associate Actuary, Life Department, The Travelers Insurance Co., 700 Main Street, Hartford 15, Conn.
*Oct. 22, 1915	WOODMAN, CHARLES E., (Retired), 75 Norman Place, Tenafly, N.J.
*Nov. 22, 1934	WOODWARD, BARBARA H., Hughes, Hubbard & Ewing, 1 Wall Street, New York 5, N. Y.
*Nov. 18, 1925	WOOLERY, JAMES M., Vice-President and Actuary, Occidental Life Insurance Company, Raleigh, North Carolina.

SCHEDULE OF MEMBERSHIP, NOVEMBER 14, 1947

	Fellows	Associates	Total
Membership, November 22, 1946	150	125	275
Additions:			
By election	..	..	..
By reinstatement	..	..	
By examination	9	12	21
	159	137	296
Deductions:			
By death	3	0	3
By withdrawal	1	2	3
By transfer from Associate to Fellow	..	8	8
Membership, November 14, 1947	155	127	282

OFFICERS OF THE SOCIETY

Since Date of Organization

Elected	*President*	*Vice-Presidents*	
1914-1915	*I. M. Rubinow	A. H. Mowbray	*B. D. Flynn
1916-1917	*J. D. Craig	*J. H. Woodward	*H. E. Ryan
1918	*J. H. Woodward	*B. D. Flynn	G. D. Moore
1919	*B. D. Flynn	G. D. Moore	W. Leslie
1920	A. H. Mowbray	W. Leslie	*L. S. Senior
1921	A. H. Mowbray	*L. S. Senior	*H. E. Ryan
1922	*H. E. Ryan	G. F. Michelbacher	E. E. Cammack
1923	W. Leslie	G. F. Michelbacher	E. E. Cammack
1924-1925	G. F. Michelbacher	*S. B. Perkins	R. H. Blanchard
1926-1927	*S. B. Perkins	G. D. Moore	T. F. Tarbell
1928-1929	G. D. Moore	S. D. Pinney	P. Dorweiler
1930-1031	T. F. Tarbell	*R. A. Wheeler	W. W. Greene
1932-1933	P. Dorweiler	W. F. Roeber	*L. S. Senior
1934-1935	W. W. Greene	R. H. Blanchard	C. J. Haugh
1936-1937	*L. S. Senior	S. D. Pinney	F. S. Perryman
1938-1939	F. S. Perryman	H. T. Barber	W. J. Constable
1940	S. D. Pinney	H. J. Ginsburgh	J. M. Cahill
1941	R. H. Blanchard	H. J. Ginsburgh	J. M. Cahill
1942	R. H. Blanchard	Albert Z. Skelding	Charles J. Haugh
1943-1944	H. J. Ginsburgh	Albert Z. Skelding	Charles J. Haugh
1945-1946	C. J. Haugh	J. M. Cahill	H. V. Williams
1947	J. M. Cahill	Harmon Barber	Russell P. Goddard

Secretary-Treasurer

1914-1917......*C. E. Scattergood
1918-1947 .... R. Fondiller

Editor†

1914.............W. W. Greene
1915-1917...........R. Fondiller
1918..............W. W. Greene
1919-1921....G. F. Michelbacher
1922-1923........O. E. Outwater
1924-1932........R. J. McManus
1933-1943.........*C. W. Hobbs
1944-1947........E. C. Maycrink

Librarian†

1914..............W. W. Greene
1915.................R. Fondiller
1916-1921...........L. I. Dublin
1922-1924...........E. R. Hardy
1925-1937.............W. Breiby
1937-1947..........T. O. Carlson

*Deceased.

†The offices of Editor and Librarian were not separated until 1916.

FELLOWS WHO HAVE DIED

The (†) denotes original membership at date of organization, November 7, 1914

Admitted		*Died*
May 24, 1921	Edward J. Bond	Nov. 12, 1941
May 19, 1915	Thomas Bradshaw	Nov. 10, 1939
June 5, 1925	William Brosmith	Aug. 22, 1937
†	William A. Budlong	June 4, 1934
Nov. 18, 1932	Charles H. Burhans	June 15, 1942
Feb. 19, 1915	F. Highlands Burns	Mar. 30, 1935
†	Raymond V. Carpenter	Mar. 11, 1947
Feb. 19, 1915	Gordon Case	Feb. 4, 1920
†	Charles T. Conway	July 23, 1921
†	Walter G. Cowles	May 30, 1942
†	James D. Craig	May 27, 1940
†	James McIntosh Craig	Jan. 20, 1922
May 26, 1916	Frederick S. Crum	Sept. 2, 1921
†	Alfred Burnett Dawson	June 21, 1931
†	Miles Menander Dawson	Mar. 27, 1942
†	Elmer H. Dearth	Mar. 26, 1947
May 19, 1915	Samuel Deutschberger	Jan. 18, 1929
†	Ezekiel Hinton Downey	July 9, 1922
May 19, 1915	Earl O. Dunlap	July 5, 1944
†	David Parks Fackler	Oct. 30, 1924
Feb. 19, 1915	Claude W. Fellows	July 15, 1938
†	Benedict D. Flynn	Aug. 22, 1944
†	Charles S. Forbes	Oct. 2, 1943
May 26, 1916	Lee K. Frankel	July 25, 1931
Feb. 25, 1916	Joseph Froggatt	Sept. 28, 1940
†	Harry Furze	Dec. 26, 1945
†	Theodore E. Gaty	Aug. 22, 1925
May 19, 1915	James W. Glover	July 15, 1941
Oct. 22, 1915	George Graham	Apr. 15, 1937
Oct. 22, 1915	Thompson B. Graham	July 24, 1946
May 25, 1923	William A. Granville	Feb. 4, 1943
†	William H. Gould	Oct. 28, 1936
†	Robert Cowen Lees Hamilton	Nov. 15, 1941
Nov. 21, 1919	Robert Henderson	Feb. 16, 1942
†	Robert J. Hillas	May 17, 1940
Nov. 15, 1918	Frank Webster Hinsdale	Mar. 18, 1932
May 23, 1924	Clarence W. Hobbs	July 21, 1944
Nov. 19, 1926	Charles E. Hodges	Jan. 22, 1937
†	Frederick L. Hoffman	Feb. 23, 1946
Nov. 21, 1919	Carl Hookstadt	Mar. 10, 1924
†	Burritt A. Hunt	Sept. 3, 1943
Nov. 28, 1921	William Anderson Hutcheson	Nov. 19, 1942
May 19, 1915	William C. Johnson	Oct. 7, 1943
Nov. 23, 1928	F. Robertson Jones	Dec. 26, 1941
Nov. 18, 1921	Thomas P. Kearney	Feb. 11, 1928
Oct. 22, 1915	Virgil Morrison Kime	Oct. 15, 1918
†	Edwin W. Kopf	Aug. 3, 1933
Feb. 17, 1915	John M. Laird	June 20, 1942
Feb. 19, 1915	Abb Landis	Dec. 9, 1937
Nov. 17, 1922	Arnette Roy Lawrence	Dec. 1, 1942
Nov. 18, 1921	James Fulton Little	Aug. 11, 1938

FELLOWS WHO HAVE DIED—*Continued*

Admitted		Died
Nov. 23, 1928	Edward C. Lunt	Jan. 13, 1941
Feb. 19, 1915	Harry Lubin	Dec. 20, 1920
Nov. 16, 1923	D. Ralph McClurg	Apr. 27, 1947
May 23, 1919	Alfred McDougald	July 28, 1944
Feb. 15, 1915	Franklin B. Mead	Nov. 29, 1933
Apr. 20, 1917	Marcus Meltzer	Mar. 27, 1931
†	David W. Miller	Jan. 18, 1936
†	James F. Mitchell	Feb. 9, 1941
†	Henry Moir	June 8, 1937
Feb. 19, 1915	William J. Montgomery	Aug. 20, 1915
May 19, 1915	Edward Bontecou Morris	Dec. 19, 1929
†	Lewis A. Nicholas	Apr. 21, 1940
†	Stanley L. Otis	Oct. 12, 1937
Nov. 13, 1926	Bertrand A. Page	July 30, 1941
Nov. 18, 1921	Sanford B. Perkins	Sept. 16, 1945
Nov. 15, 1918	William Thomas Perry	Oct. 25, 1940
†	Edward B. Phelps	July 24, 1915
†	Charles Grant Reiter	July 30, 1937
†	Charles H. Remington	Mar. 21, 1938
†	Isaac M. Rubinow	Sept. 1, 1936
†	Harwood Eldridge Ryan	Nov. 2, 1930
†	Arthur F. Saxton	Feb. 26, 1927
†	Emil Scheitlin	May 2, 1946
†	Leon S. Senior	Feb. 3, 1940
Apr. 20, 1917	Charles Gordon Smith	June 22, 1938
Feb. 19, 1915	John T. Stone	May 9, 1920
Feb. 25, 1916	Wendell Menville Strong	Mar. 30, 1942
†	Robert J. Sullivan	July 19, 1934
Nov. 22, 1934	Walter H. Thompson	May 25, 1935
Nov. 18, 1921	Guido Toja	Feb. 28, 1933
May 23, 1919	Archibald A. Welch	May 8, 1945
Nov. 19, 1926	Roy A. Wheeler	Aug. 26, 1932
†	Albert W. Whitney	July 27, 1943
†	S. Herbert Wolfe	Dec. 31, 1927
†	Joseph H. Woodward	May 15, 1928
†	William Young	Oct. 23, 1927

ASSOCIATES WHO HAVE DIED

Admitted		Died
Oct. 22, 1915	Don A. Baxter	Feb. 10, 1920
Nov. 22, 1934	John J. Gately	Nov. 3, 1943
Nov. 20, 1924	Leslie LeVant Hall	Mar. 8, 1931
Oct. 31, 1917	Edward T. Jackson	May 8, 1939
Nov. 19, 1929	Fritz Muller	Apr. 27, 1945
Nov. 23, 1928	Karl Newhall	Oct. 24, 1944
Nov. 18, 1927	Alexander A. Speers	June 25, 1941
Mar. 23, 1921	Arthur E. Thompson	Jan. 17, 1944
Nov. 21, 1919	Walter G. Voogt	May 8, 1945
Nov. 18, 1925	James H. Washburn	Aug. 19, 1946
Nov. 17, 1920	James J. Watson	Feb. 23, 1937
Nov. 18, 1921	Eugene R. Welch	Jan. 17, 1945
Nov. 15, 1918	Albert Edward Wilkinson	June 11, 1930

CONSTITUTION

(As Amended November 15, 1940)

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 Fellows and those who may be duly admitted to Fellowship as hereinafter provided. The Associates shall be the present Associates and those who may be duly admitted to Associateship as hereinafter provided.

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.

Any person who shall have qualified for Associateship may 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.

Article IV.—*Officers and Council.*

The officers of the Society shall be a President, two Vice-Presidents, a Secretary-Treasury, an Editor, and a Librarian. The Council shall be composed of the active officers, nine other Fellows and, during the four years following the expiration of their terms of office, the ex-Presidents and ex-Vice-Presidents. The Council shall fill vacancies occasioned by death or resignation of any officer or other member of the Council, such appointees to serve until the next annual meeting of the Society.

ARTICLE V.—*Election of Officers and Council.*

The President, Vice-Presidents, and the Secretary-Treasurer shall be elected by a majority ballot at the annual meeting for the term of one year and three members of the Council shall, in a similar manner, be annually elected to serve for three years. The President and Vice-Presidents shall not be eligible for the same office for more than two consecutive years nor shall any retiring member of the Council be eligible for re-election at the same meeting.

The Editor and the Librarian shall be elected annually by the Council at the Council meeting preceding the annual meeting of the Society. They shall be subject to confirmation by majority ballot of the Society at the annual meeting.

The terms of the officers shall begin at the close of the meeting at which they are elected except that the retiring Editor shall retain the powers and duties of office so long as may be necessary to complete the then current issue of *Proceedings.*

ARTICLE VI.—*Duties of Officers and Council.*

The duties of the officers shall be such as usually appertain to their respective offices or may be specified in the by-laws. The duties of the Council shall be to pass upon candidates for membership, to decide upon papers offered for reading at the meetings, to supervise the examination of candidates and prescribe fees therefor, to call meetings, and in general, through the appointment of committees and otherwise, to manage the affairs of the Society.

ARTICLE VII.—*Meetings.*

There shall be an annual meeting of the Society on such date in the month of November as may be fixed by the Council in each year, but other meetings may be called by the Council from time to time and shall be called by the President at any time upon the written request of ten Fellows. At least two weeks notice of all meetings shall be given by the Secretary.

ARTICLE VIII.—*Quorum.*

Seven members of the Council shall constitute a quorum. Twenty Fellows of the Society shall constitute a quorum.

ARTICLE IX.—*Expulsion or Suspension of Members.*

Except for non-payment of dues no member of the Society shall be expelled or suspended save upon action by the Council with not more than three negative votes followed by a three-fourths ballot of the Fellows present and voting at a meeting of the Society.

ARTICLE X.—*Amendments.*

This constitution may be amended by an affirmative vote of two-thirds of the Fellows present at any meeting held at least one month after notice of such proposed amendment shall have been sent to each Fellow by the Secretary.

BY-LAWS

(As Amended November 22, 1946)

Article I.—*Order of Business.*

At a meeting of the Society the following order of business shall be observed unless the Society votes otherwise for the time being:

1. Calling of the roll.
2. Address or remarks by the President.
3. Minutes of the last meeting.
4. Report by the Council on business transacted by it since the last meeting of the Society.
5. New membership.
6. Reports of officers and committees.
7. Election of officers and Council (at annual meetings only).
8. Unfinished business.
9. New business.
10. Reading of papers.
11. Discussion of papers.

Article II.—*Council Meetings.*

Meetings of the Council shall be called whenever the President or three members of the Council so request, but not without sending notice to each member of the Council seven or more days before the time appointed. Such notice shall state the objects intended to be brought before the meeting, and should other matter be passed upon, any member of the Council shall have the right to re-open the question at the next meeting.

Article III.—*Duties of Officers.*

The President, or, in his absence, one of the Vice-Presidents, shall preside at meetings of the Society and of the Council. At the Society meetings the presiding officer shall vote only in case of a tie, but at the Council meetings he may vote in all cases.

The Secretary-Treasurer shall keep a full and accurate record of the proceedings at the meetings of the Society and of the Council, send out calls for the said meetings, and, with the approval of the President and Council, carry on the correspondence of the Society. Subject to the direction of the Council, he shall have immediate charge of the office and archives of the Society.

The Secretary-Treasurer shall also send out calls for annual dues and acknowledge receipt of same; pay all bills approved by the President for expenditures authorized by the Council of the Society; keep a detailed account of all receipts and expenditures, and present an abstract of the same at the annual meetings, after it has been audited by a committee of the Council.

The Editor shall, under the general supervison 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 Council shall fix the annual dues for Fellows and for Associates. The payment of dues will be waived in the case of Fellows or Associates who have attained the age of seventy years or who, having been members for a period of at least twenty years, shall have attained the age of sixty-five years. Fellows and Associates who have become totally disabled while members may upon approval of the Council be exempted from the payment of dues during the period of disability.

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.

SYLLABUS OF EXAMINATIONS

(Effective 1948 and Thereafter)

ASSOCIATESHIP

Part	*Sections*	*Subjects*
I	1	Descriptive and Analytical Statistics.
	2	Compound Interest and Annuities Certain.
II	3	Differential and Integral Calculus.
	4	Calculus of Finite Differences.
III	5	Probabilities.
	6	Life Contingencies, Life Annuities and Life Assurances.
IV	7	Policy Forms and Underwriting Practice in Casualty Insurance.
	8	Casualty Insurance Rate Making Methods.

FELLOWSHIP

I	9	Insurance Economics.
	10	Insurance Law and Regulation.
II	11	Individual Risk Rating.
	12	Social Insurance.
III	13	Determination of Premium, Loss and Expense Reserves.
	14	Advanced Problems in Casualty Insurance Statistics.
IV	15	Advanced Problems in Casualty Insurance Accounting.
	16	Advanced Problems in the Underwriting and Administration of Casualty Insurance.

RULES REGARDING EXAMINATIONS FOR ADMISSION TO THE CASUALTY ACTUARIAL SOCIETY

1. **Dates of Examination.**

Examinations will be held on the second Tuesday and following Wednesday during the month of May in each year in such cities as will be convenient for three or more candidates.

2. **Filing of Application.**

Application for admission to examination should be made on the Society's blank form, which may be obtained from the Secretary-Treasurer. No applications will be considered unless received before the fifteenth day of February preceding the dates of examination. Applications should definitely state for what parts the candidate will appear.

3. **Fees.**

The examination fee is $2.00 for each part, with a minimum of $5.00 for each year in which the candidate presents himself; thus for one or two parts, $5.00, for three parts, $6.00, etc. Examination fees are payable to the order of the Society and must be received by the Secretary-Treasurer before the fifteenth day of February preceding the dates of examination.

4. **Associateship and Fellowship Examinations.**

(a) The examination for Associateship consists of four parts and that for Fellowship consists of four parts. A candidate may take any one or more of the four parts of the Associateship Examination. A candidate may present himself for part of the Fellowship Examination either (a) if he has previously passed the Associateship Examination and all preceding parts of the Fellowship Examination, or (b) if he concurrently presents himself for and submits papers for all unpassed parts of the Associateship Examination and all preceding unpassed parts of the Fellowship Examination. Subject to the foregoing requirements, the candidate will be given credit for any part or parts of either examination which he may pass.

(b) A candidate who has passed the Associateship Examination Parts I-IV prior to 1941, but who has not been enrolled as an Associate because of lack of the experience qualifications required by the examination rules effective prior to 1941, will be enrolled as an Associate upon passing the current Associateship Examination Part IV.

(c) An Associate who has passed no part of the Fellowship Examination under the Syllabus effective prior to 1941 is required, in order to qualify for admission as a fellow, to pass the current Associateship Examination Part IV and Fellowship Examination Parts I-IV.

(d) A candidate who has passed one or more parts of the Associateship or Fellowship Examinations under the Syllabus effective prior to 1948 will receive credit for the corresponding parts of the new Syllabus in accordance with the following table:

Parts Passed Under Old Syllabus (Effective Prior to 1948)			*Parts Credited Under New Syllabus (Effective in 1948)*		
Associateship,	Part	I	Associateship,	Part	I - Section 2
"	"	II	"	"	II
"	"	III	"	"	I - Section 1
"	"	IV	"	"	III
"	"	V	"	"	IV
Fellowship,	Part	I	Fellowship,	Part	I
"	"	II	"		Parts III & IV - Section 15
"	"	III	"		Parts II & IV - Section 16

Partial examinations will be given to those students requiring same in accordance with the foregoing credits.

(e) In the case of a candidate for admission as Associate who has served for a period of at least two years in the armed forces of the United States or Canada or services directly connected therewith, and who shall have completed courses in any of the sections included in Parts I, II of the Associate Examinations at a college or university of recognized standards, the examinations in such sections may be waived at the discretion of the Examination Committee subject to the following conditions and limitations.

1. Such courses shall have been completed within 10 years prior to date of application for such waiver.
2. The courses shall have been at least equivalent to those required to qualify the candidate to meet the examination requirements.
3. The grades obtained shall have been satisfactory.

The foregoing waiver of examinations provision shall not apply to candidates applying for admission subsequent to February 15, 1948. Any such waiver made shall lapse if the candidate shall fail to attain Associateship status prior to December 1, 1950.

5. **Alternative to Passing of Fellowship Parts III and IV.**

As an alternative to the passing of Parts III and IV of the Fellowship Examination, a candidate may elect to present an original thesis on an approved subject relating to casualty or social insurance. Such thesis must show evidence of ability for original research and the solution of advanced problems in casualty insurance comparable with that required to pass Parts III and IV of the Fellowship Examination, and shall not consist solely of data of an historical nature. Candidates electing this alternative should communicate with the Secretary-Treasurer and obtain through him approval by the Examination Committee of the subject of the thesis. In communicating with the Secretary-Treasurer, the candidate should state, in addition to the subject of the thesis, the main divisions of the subject and general method of treatment, the approximate number of words and the approximate proportion to be devoted to data of an historical nature. All theses must be in the hands of the Secretary-Treasurer before the second Tuesday in May of the year in which they are to be considered. No examination fee will be required in connection with the presentation of a thesis. All theses submitted are, if accepted, to be the property of the Society and may, with the approval of the Council, be printed in the *Proceedings*.

6. **Waiver of Examinations for Associate.**

The examinations for Associate will be waived under Article III of the Constitution only in case of those candidates who meet the following qualifications and requirements:

(a) The candidate shall be at least thirty-five years of age.

(b) The candidate shall have had at least ten years' experience in casualty actuarial or statistical work or in a phase of casualty insurance which requires a working knowledge of actuarial or statistical procedure or in the teaching of casualty insurance principles in colleges or universities. Experience limited exclusively to the field of accident and health insurance shall not be admissible.

(c) For the two years preceding date of application, the candidate shall have been in responsible charge of the actuarial or statistical department of a casualty insurance organization or of an important division of such department or shall have occupied an executive position in connection with the phase of casualty work in which he is engaged, or, if engaged in teaching, shall have attained the status of a professor. In the case of a candidate who has spent at least one year in the armed forces of the United States or Canada or services directly connected therewith, the two years requirement stated above shall be reduced to one year.

(d) The candidate shall have submitted a thesis approved by the Examination Committee. Such thesis must show evidence of original research and knowledge of casualty insurance and shall not consist solely of data of an historical nature. Candidates electing this alternative should communicate with the Secretary-Treasurer and obtain through him approval by the Examination Committee of the subject of the thesis. In communicating with the Secretary-Treasurer, the candidate should state, in addition to the subject of the thesis, the main divisions of the subject and general method of treatment, the approximate number of words and the approximate proportion to be devoted to data of an historical nature.

LIBRARY

The Society's library contains all of the references listed in the Recommendations for Study, including the books noted as being out of print, with the exception of certain periodicals and publications subject to periodical revision. It also contains numerous other works on casualty actuarial matters. Registered students may have access to the library by receiving from the Society's Secretary-Treasurer the necessary credentials. Books may be withdrawn from the library for a period of two weeks upon payment of a small service fee and necessary postage.

The library is in the immediate charge of Miss Mabel B. Swerig, Librarian of the Insurance Society of New York, 107 William Street, New York City.

CASUALTY ACTUARIAL SOCIETY

ORGANIZED 1914

Recommendations for Study

EDUCATIONAL COMMITTEE

THOMAS O. CARLSON, *Chairman*

FREELAND R. CAMERON — JACK J. SMICK

CLARENCE A. KULP — NELS M. VALERIUS

NORTON E. MASTERSON

EIGHTH EDITION, 1947

The following schedule comprises a complete set of the *Proceedings* issued to date.

Number	Volume	Pages	Number	Volume	Pages
1	I	76	31	XV	136
2	I	130	32	XV	168
3	I	109	33	XVI	282
4	II	186	34	XVI	167
5	II	148	35	XVII	160
6	II	196	36	XVII	191
7	III	128	37	XVIII	252
8	III	200	38	XVIII	279
9	IV	248	39	XIX	214
10	IV	218	40	XIX	202
11	V	196	41	XX	254
12	V	198	42	XX	162
13	VI	168	43	XXI	240
14	VI	268	44	XXI	202
15	VII	216	45	XXII	211
16	VII	263	46	XXII	200
17	VIII	176	47	XXIII	134
18	VIII	185	48	XXIII	196
19	IX	176	49	XXIV	232
20	IX	221	50	XXIV	267
21	X	98	51	XXV	290
22	X	161	52	XXV	192
23	XI	190	53	XXVI	307
24	XI	181	54	XXVI	168
25	XII	204	55	XXVII	235
26	XII	216	56	XXVII	264
27	XIII	146	57	XXVIII	278
28	XIII	218	58	XXVIII	373
29	XIV	220	59	XXIX	208
30	XIV	274	60	XXX	127
			61	XXXI	88
			62	XXXII	190
			63	XXXIII	116

Communications should be addressed to

RICHARD FONDILLER,
Secretary-Treasurer
CASUALTY ACTUARIAL SOCIETY
90 JOHN ST., NEW YORK.

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(b) A candidate who has passed the Associateship Examination Parts I-IV prior to 1941, but who has not been enrolled as an Associate because of lack of the experience qualifications required by the examination rules effective prior to 1941, will be enrolled as an Associate upon passing the current Associateship Examination Part IV.

(c) An Associate who has passed no part of the Fellowship Examination under the Syllabus effective prior to 1941 is required, in order to qualify for admission as a fellow, to pass the current Associateship Examination Part IV and Fellowship Examination Parts I-IV.

(d) A candidate who has passed one or more parts of the Associateship or Fellowship Examinations under the Syllabus effective prior to 1948 will receive credit for the corresponding parts of the new Syllabus in accordance with the following table:

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"	"	V	"	"	IV
Fellowship,	Part	I	Fellowship,	Part	I
"	"	II	"		Parts III & IV-Section 15
"	"	III	"		Parts II & IV -Section 16

Partial examinations will be given to those students requiring same in accordance with the foregoing credits.

(e) In the case of a candidate for admission as Associate who has served for a period of at least two years in the armed forces of the United States or Canada or services directly connected therewith, and who shall have completed courses in any of the sections included in Parts I-II [redacted] of the Associate Examinations at a college or university of recognized standards, the examinations in such sections may be waived at the discretion of the Examination Committee subject to the following conditions and limitations.

1. Such courses shall have been completed within 10 years prior to date of application for such waiver
2. The courses shall have been at least equivalent to those required to qualify the candidate to meet the examination requirements.

3. The grades obtained shall have been satisfactory.

The foregoing waiver of examinations provision shall not apply to candidates applying for admission subsequent to February 15, 1948. Any such waiver made shall lapse if the candidate shall fail to attain Associateship status prior to December 1, 1950.

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6. WAIVER OF EXAMINATIONS FOR ASSOCIATE.

The examinations for Associate will be waived under Article III of the Constitution only in case of those candidates who meet the following qualifications and requirements:

(a) The candidate shall be at least thirty-five years of age.

(b) The candidate shall have had at least ten years' experience in casualty actuarial or statistical work or in a phase of casualty insurance which requires a working knowledge of actuarial or statistical procedure or in the teaching of casualty insurance principles in colleges or universities. Experience limited exclusively to the field of accident and health insurance shall not be admissable.

(c) For the two years preceding dateof application, the candidate shall have been in responsible charge of the actuarial or statistical department of a casualty insurance organization or of an important division of such department or shall have occupied an executive position in connection with the phase of casualty work in which he is engaged, or, if engaged in teaching, shall have attained the status of a professor. In the case of a candidate who has spent at least one year in the armed forces of the United States or Canada or services directly connected therewith, the two years requirement stated above shall be reduced to one year.

(d) The candidate shall have submitted a thesis approved by the Examination Committee. Such thesis must show evidence of original research and knowledge of casualty insurance and shall not consist solely of data of an historical nature. Candidates electing this alternative should communicate with the Secretary-Treasurer and obtain through him approval by the Examination Committee of the subject of the thesis. In communicating with the Secretary-Treasurer, the candidate should state, in addition to the subject of the thesis, the main divisions of the subject and general method of treatment, the approximate number of words and the approximate proportion to be devoted to data of an historical nature.

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SYLLABUS OF EXAMINATIONS
(Effective 1948 and Thereafter)

ASSOCIATESHIP

Part	*Sections*	*Subjects*
I	1	Descriptive and Analytical Statistics.
	2	Compound Interest and Annuities Certain.
II	3	Differential and Integral Calculus.
	4	Calculus of Finite Differences.
III	5	Probabilities.
	6	Life Contingencies, Life Annuities and Life Assurances.
IV	7	Policy Forms and Underwriting Practice in Casualty Insurance.
	8	Casualty Insurance Rate Making Methods.

FELLOWSHIP

I	9	Insurance Economics.
	10	Insurance Law and Regulation.
II	11	Individual Risk Rating.
	12	Social Insurance.
III	13	Determination of Premium, Loss and Expense Reserves.
	14	Advanced Problems in Casualty Insurance Statistics.
IV	15	Advanced Problems in Casualty Insurance Accounting.
	16	Advanced Problems in the Underwriting and Administration of Casualty Insurance.

RECOMMENDATIONS FOR STUDY

The examinations for admission to the two grades of membership in the Society are designed to extablish the qualifications of candidates. The following Recommendations for Study are provided as a guide for the candidates in their preparation for the examinations. It should be realized that although the examination questions will be based upon the textual material cited, they will not necessarily be drawn directly therefrom. The examinations will test not only the candidate's knowledge of the subject matter but also his ability to apply that knowledge.

Under the mathematical parts (Sections 1-6) of the Associateship Examination, there are listed a few sources of examples in addition to those found in the texts cited. Candidates are advised to work out as many examples as possible in their study of these sections in order to acquire facility in the application of the mathematical principles and methods to specific problems.

In preparing for the Associateship Part IV and the Fellowship Examinations, the candidate should be familiar with pertinent papers published in the Proceedings of the Casualty Actuarial Society subsequent to November, 1945, in addition to the references cited. The candidate should also read at least one insurance journal for the year preceding his examination in order to be familiar with current developments.

The references to papers in the Proceedings of the Casualty Actuarial Society (denoted by P.C.A.S.) and in the Transactions of the Actuarial Society of America (denoted by T.A.S.A.) are considered to include all discussions of these papers in these publications, though the page references cited refer to the papers only.

Description of texts cited will be found in the Index at the end of these Recommendations.

Candidates can review the examinations given in previous years by referring to the reprints contained in both the annual Year Book and the Proceedings of the Society. Copies of examinations for recent years may be obtained from the Secretary-Treasurer.

ASSOCIATESHIP: PART I

The candidate should have adequate preparation in business arithmetic and in algebra as a prerequisite to study for these examinations. The preparation in algebra should include the equivalent of the first 14 chapters of "Higher Algebra" by Hall and Knight (published by Macmillan) with particular emphasis upon permutations and combinations and the binomial theorem.

SECTION 1. DESCRIPTIVE AND ANALYTICAL STATISTICS.

Richardson, C.H.: An Introduction to Statistical Analysis.

SECTION 2. COMPOUND INTEREST AND ANNUITIES CERTAIN.

Rietz, H.L., Crathorne, A.R. and Rietz, J.C.: Mathematics of Finance. Chapters 1-7.

Skinner, E.B.: Mathematical Theory of Investment. (Included as a source of additional examples.)

ASSOCIATESHIP: PART II

SECTION 3. DIFFERENTIAL AND INTEGRAL CALCULUS.

Granville, W.A., Smith, P.F. and Longley, W.R.: Elements of Calculus. Except Chapters 14, 18, 21 and 24.

SECTION 4. CALCULUS OF FINITE DIFFERENCES.

Freeman, Harry: Mathematics for Actuarial Students; Part II - Finite Differences, Probability and Elementary Statistics. Chapters 1-7 and 9.

ASSOCIATESHIP: PART III

SECTION 5. PROBABILITIES.

Hall, H.S. and Knight, S.R.: Higher Algebra. Chapter 32.

Freeman, Harry: Mathematics for Actuarial Students; Part II - Finite Differences, Probability and Elementary Statistics. Chapter 10.

Whitworth, W.A.: Choice and Chance. (Included as a source of additional examples.)

SECTION 6. LIFE CONTINGENCIES, LIFE ANNUITIES AND LIFE ASSURANCES.

Menge, W.O. and Glover, J.W.: An Introduction to the Mathematics of Life Insurance.

Dowling, L. Wayland: Mathematics of Life Insurance. Chapter 9.

Department of Labor, State of New York: Special Bulletin No. 207, Workmen's Compensation Tables.

Greene, W.W.: Valuation of the Death Benefits Provided by the New York Compensation Law. P.C.A.S. I, 31.

Olifiers, Edward: Valuation of the Death Benefits Provided by the Workmen's Compensation Law of New York. T.A.S.A. XVI, 83.

Fondiller, Richard: Tables for Computing the Present Value of Death Benefits Arising Under the New York Workmen's Compensation Law. P.C.A.S. II, 110.

Roeber, W.F. and Marshall, R.M.: An American Remarriage Table. P.C.A.S. XIX, 279.

Greville, Thomas N.E.: United States Bureau of the Census: United States Life Tables and Actuarial Tables, 1939-1941. Parts 1-4.

The candidate should have a working knowledge of the tables set forth in Special Bulletin No. 207, published by the New York Department of Labor. The cited paper by Fondiller will be of particular help in this regard, although his examples are based on an earlier edition of the tables. The cited papers by Greene and Olifiers should be read for an understanding of the theory underlying certain of the tables, but the candidate will not be required to reproduce the derivation of the formulas contained therein.

ASSOCIATESHIP: PART IV

SECTION 7. POLICY FORMS AND UNDERWRITING PRACTICE IN CASUALTY INSURANCE.

SECTION 8. CASUALTY INSURANCE RATE MAKING METHODS.

The first two general references cited below should be considered as introductory to the study of the material included under both of these sections. The earlier chapters in the Hobbs text are also largely prerequisite in substance.

The candidate should be familiar with policy provisions, the bases of exposure used in the respective lines and the manual ratemaking procedures. Since the manual and policy provisions change from time to time it is essential to supplement the cited texts and papers by study of the contracts and manuals currently in use. The principal current manuals, with the names of the organizations publishing them, are cited herein. Copies of current insurance contracts must be obtained from a carrier.

It should be noted that certain of the references encompass some material beyond the scope of Sections 7 and 8, such as the actuarial principles underlying the respective individual risk rating plans, the determination of deductible and excess coverage rates and the determination of reserves. The examinations for this part will not reflect such extraneous material.

(a) General.

Kulp, C.A.: Casualty Insurance. Chapters 2-4,8,10-15, and 18.

Michelbacher, G.F. and Associates: Casualty Insurance Principles. Chapters 1, 5-7, and 13.

Dorweiler, Paul: Notes on Exposures and Premium Bases. P.C.A.S. XVI, 319.

Perryman, F.S.: Some Notes on Credibility. P.C.A.S. XIX, 65.

Important material on the determination of manual rates is contained in the reports on the examination of the following rate making organizations by the New York Insurance Department, which appear at intervals of three to five years:

Board of Aviation Underwriters
Compensation Insurance Rating Board (New York)
Mutual Casualty Insurance Rating Bureau
National Bureau of Casualty Underwriters
Towner Rating Bureau

In addition, reference should be made to the three latest reports of the National Association of Insurance Commissioners.

(b) Accident and Health.

Faulkner, E.J.: Accident and Health Insurance.

Craig, J.D.: The Actuarial Basis for Premiums and Reserves in Personal Accident and Health Insurance. P.C.A.S. XVII, 51.

Lamont, S.M.: The Contract of Personal Accident and Health Insurance. P.C.A.S. XVIII, 9.

Miller, J.H.: History and Present Status of Non-Cancellable Accident and Health Insurance. P.C.A.S. XXI, 235.

Hart, W.V.B.: Recent Developments in Commercial Accident and Health Insurance. P.C.A.S. XXI, 291.

Farley, Jarvis: A 1940 View of Non-Cancellable Disability Insurance. P.C.A.S. XXVII, 18.

Hunter, Arthur and Thompson, Allen B.: Hospital Service Insurance. T.A.S.A. XLIV, 5.

(c) Automobile Liability.

Sawyer, E.W.: Automobile Liability Insurance, An Analysis of the National Standard Policy Provisions.

Informal Discussion: Automobile Liability Insurance. P.C.A.S. XXII, 133.

Manual of Automobile Insurance published by National Bureau of Casualty Underwriters, 60 John Street, New York.

(d) Aviation.

Comstock, W.P.: Aviation Casualty Insurance. P.C.A.S. XIX, 246.

Woodward, B.H.: Aviation Insurance. P.C.A.S. XXV, 81.

Stewart, D.M.: Aviation Insurance. (The Casualty Educator, Vol. III.)

(e) Boiler and Machinery.

Smith, Seymour E.: Boiler and Machinery Insurance. P.C.A.S. XXIX, 5.

Manual of Boiler and Machinery Insurance published by National Bureau of Casualty Underwriters, 60 John Street, New York.

(f) Burglary, Theft and Robbery Insurance.

Manual of Burglary, Theft and Robbery Insurance published by National Bureau of Casualty Underwriters, 60 John Street, New York.

(g) Fidelity and Surety.

Crist, G.W. Jr.: Corporate Suretyship. Except Chapter 7.

Lunt, E.C.: Surety Rate Making. P.C.A.S.XXV, 16.

Informal Discussion: Surety Rate Making. P.C.A.S. XXV, 180.

Rate Manual of Fidelity, Forgery and Surety Bonds published by Towner Rating Bureau, Inc., 60 John Street, New York.

(h) *General Liability.*

Cahill, J.M.: Product Public Liability Insurance. P.C.A.S. XXI, 26.

Ainley, J.W.: Problems in Relation to Contractual Liability Insurance. P.C.A.S. XXV, 151.

Sawyer, E.W.: Comprehensive Liability Insurance.

Contractual, Elevator, Manufacturers' and Contractors', Owners', Landlords' and Tenants', Owners' or Contractors' Protective and Product Liability Manuals published by National Bureau of Casualty Underwriters, 60 John Street, New York.

(i) *Glass.*

Manual of Glass Insurance published by National Bureau of Casualty Underwriters, 60 John Street, New York.

(j) *Workmen's Compensation.*

The candidate should be familiar with the general rate making methods used by the National Council on Compensation Insurance, together with the modifications adopted in New York.

Hobbs, C.W.: Workmen's Compensation Insurance. Chapters 1-4, 6-10, 12, 13 and 16-18.

Graham, C.M.: The Practice of Workmen's Compensation Rate Making as Illustrated by the 1939 Revision of New York Rates. P.C.A.S. XXVI, 47.

Johnson, R.A.Jr.: Recent Developments in New York Compensation Rate Making. P.C.A.S. XXVII, 144.

The Basic Manual of Rules, Classifications and Rates for Workmen's Compensation and Employers' Liability Insurance published by National Council on Compensation Insurance, 45 East 17th Street, New York.

SECTION 9. INSURANCE ECONOMICS.

Willett, A.H.: Economic Theory of Risk and Insurance.

Kulp, C.A.: Casualty Insurance. Chapter I.

Moulton, H.G.: Financial Organization and the Economic System.

Jordan, D.F.: Investments.

SECTION 10. INSURANCE LAW AND REGULATION.

(a) Introduction to the Law.

Stone, H.F.: Law and Its Administration.

Conyngton, T. and Bergh, L.O.: Business Law.

(b) Principles of the Law of Insurance.

Patterson, E.W.: Essentials of Insurance Law. Chapters 2, 3 and 5-12.

(c) Supervision, Regulation and Taxation of Insurance.

Hobbs, C.W.: Workmen's Compensation Insurance. Chapters 5 and 15.

Kulp, C.A.: Casualty Insurance. Chapter 20.

Michelbacher, G.F. and Associates: Casualty Insurance Principles. Chapter 4.

Patterson, E.W.: Essentials of Insurance Law. Chapter I.

New York Insurance Law. Articles I-V, VII, VIII, X and XVII.

New York Tax Law. Section 187.

Hobbs, C.W.: State Regulation of Insurance Rates. P.C.A.S. XXVIII, 37 and 344.

Maycrink, E.C.: Procedure in the Examination of Casualty Companies by Insurance Departments. P.C.A.S. XVIII, 81.

Sawyer, E.W.: Insurance as Interstate Commerce.

Donovan, James B.: Insurance Business as Engaging in Commerce and as Affected by the Federal Anti-Trust Statutes. New York Law Journal Vol. 116, pages 290, 298, 306 and 314. (Included in the Casualty Actuarial Society Library under the title "SEUA Case and Aftermath.")

Rate Regulatory Laws - Casualty and Surety. (Compilation by Association of Casualty and Surety Companies, 60 John Street, New York.)

The candidate should be familiar with the decision of the United States Supreme Court handed down June 5, 1944 in the case of United States v. South-Eastern Underwriters Assn. et al. (322 U.S. 533, 64 Sup. Ct. 1162), with the McCarran Act passed by Congress and effective March 9, 1945 and with the extension of the McCarran Act effective January 1, 1948. All of the foregoing references except the last three antedate this decision, and should be read with that fact in mind. The candidate should be familiar with developments stemming from the Supreme Court decision and the consequent Congressional action, as reported in insurance periodicals. Familiarity is also required with the Casualty and Surety Rate Regulatory Bill developed by the All Industry Committee which was organized to work in cooperation with the National Association of Insurance Commissioners, and the fundamental points of difference in the legislation passed in the respective states for regulation of rates in the casualty and surety field of insurance. The texts of the Supreme Court Decision, Congressional Acts resulting therefrom, the All Industry Bill together with an explanatory memorandum prepared by the All Industry Committee, the rate regulatory legislation in the respective states, and the material cited above from Mr. Sawyer and Mr. Donovan are all available from the Casualty Actuarial Society library.

The Proceedings of the National Association of Insurance Commissioners from 1944 to date should be reviewed for all discussions and committee reports relating to the Supreme Court decision and subsequent legislative developments.

FELLOWSHIP: PART II

SECTION 11. INDIVIDUAL RISK RATING.

The candidate should study the following rating plans effective in the State of New York and the forms used in the application thereof (published by the National Bureau of Casualty Underwriters, 60 John Street, New York.)

Automobile Liability Experience Rating Plan.
Burglary Experience Rating Plan.
Glass Experience Rating Plan.
Public Liability Experience Rating Plan.

The candidate should also study the following rating plans in the workmen's compensation field and the forms used in the application thereof (published by the National Council on Compensation Insurance 45 East 17th Street, New York.)

Workmen's Compensation Experience Rating Plan.

Workmen's Compensation Retrospective Rating Plans - 1943.

The candidate is advised to read the references in the books by Michelbacher and Hobbs cited below to obtain the general principles underlying individual risk rating, prior to studying the respective plans and the technical articles cited from the Proceedings. It should be noted that the general subject of individual risk rating includes the determination of rates for coverages other than full coverage, such as deductible, excess and aggregate stop loss.

Michelbacher, G.F. and Associates: Casualty Insurance Principles. Chapter 8.

Hobbs, C.W.; Workmen's Compensation Insurance. Chapters 17 and 18.

Kulp, C.A.: Casualty Insurance. Chapter 19.

Whitney, A.W.: The Theory of Experience Rating. P.C.A.S. IV, 274.

Keffer, Ralph: An Experience Rating Formula. T.A.S.A.XXX, 130.

Dorweiler, Paul: Observations on Making Rates for Excess Compensation Insurance. P.C.A.S. XIII, 154.

Richardson, H.F.: The Chemical and Dyestuff Rating Plan. P.C.A.S. XVIII, 385.

Dorweiler, Paul: A Survey of Risk Credibility in Experience Rating. P.C.A.S. XXI, 1.

Kormes, Mark: The Experience Rating Plan as Applied to Workmen's Compensation Risks. P.C.A.S.XXI, 81; XXII, 81.

Cahill, J.M.: Deductible and Excess Coverages, Liability and Property Damage Lines Other Than Automobile. P.C.A.S. XXIII, 18.

Perryman, F.S.; Experience Rating Plan Credibilities. P.C.A.S. XXIV, 60.

Pinney, S.D.: The Retrospective Rating Plan for Workmen's Compensation Risks. P.C.A.S. XXIV, 291.

Smick, J.J.: Merit Rating-The Proposed Multi-Split Experience Rating Plan and the Present Experience Rating Plan. P.C.A.S. XXVI, 84.

Cahill, James M.: Excess Coverage (Per Accident Basis) for Self-Insurers: Workmen's Compensation - New York. P.C.A.S. XXVII, 77.

Peters, Stefan: Ex-Medical Coverage - Workmen's Compensation. P.C.A.S. XXVII, 112.

Johnson, R.A. Jr.: The Multi-Split Experience Rating Plan in New York. P.C.A.S. XXVIII, 15.

Dorweiler, Paul: On Graduating Excess Pure Premium Ratios. P.C.A.S. XXVIII, 132.

Carlson, T.O.: An Actuarial Analysis of Retrospective Rating. P.C.A.S. XXVIII, 283.

Haugh, C.J.: The Comprehensive Insurance Rating Plan. P.C.A.S. XXVIII, 535.

Valerius, N.M.: Risk Distributions Underlying Insurance Charges in the Retrospective Rating Plan. P.C.A.S. XXIX, 96.

Perryman, F.S.: Possible Values for Retrospective Rating Plan. P.C.A.S. XXXI, 5.

Reference should also be made to the reports cited in Sections 8 on the examination of rate making organizations by the New York Insurance Department for such information as is contained therein on individual risk rating plans.

SECTION 12. SOCIAL INSURANCE.

(a) General.

International Labour Office: Approaches to Social Security. Studies and Reports. Series M, No. 18.

Williamson, W.R.: Social Budgeting. P.C.A.S. XXIV, 17.

Williamson, W.R.: Some Backgrounds to American Social Security. P.C.A.S. XXX, 5.

Meriam, L.: Relief and Social Security. Parts II and III.

Social Security Administration.: Compilation of the Social Security Laws (latest edition).

(b) Compulsory Automobile Insurance.

Committee to Study Compensation for Automobile Accidents: Report to the Columbia University Council for Research in the Social Sciences. Chapter 2.

Kulp, C.A.: Casualty Insurance. Chapter 9.

(c) Health Insurance.

U.S. Social Security Board: Disability Among Gainfully Occupied Persons. Bureau Memorandum No. 61.

Sinai, N., Anderson, O.W., and Dollar, M.L.: Health Insurance in the United States.

(d) Old Age Assistance and Insurance.

Grant, Margaret: Old Age Security.

Meriam, L.: Relief and Social Security. Chapters 2, 5 and 6.

House Ways and Means Committee: Issues in Social Security. Parts I and II.

Féraud, Lucien: Actuarial Technique and Financial Organization of Social Insurance (Introduction only). International Labour Office. Studies and Reports. Series M, No. 17.

(e) Unemployment Insurance.

Department of Labor, State of New York: Economic Brief in Support of the New York Unemployment Insurance Law.

Meriam, L.: Relief and Social Security. Chapters 8 and 9.

House Ways and Means Committee: Issues in Social Security. Part III.

Social Security Administration: Comparison of State Unemployment Compensation Laws (latest edition).

Kulp, C.A.: Calculation of the Cost of Unemployment Benefits (With Particular Reference to Ohio and Pennsylvania). P.C.A.S. XIX, 268.

FELLOWSHIP: PART III

SECTION 13. DETERMINATION OF PREMIUM, LOSS AND EXPENSE RESERVES.

Michelbacher, G.F. and Associates: Casualty Insurance Principles. Chapter 9.

Black, N.C.: Method of Setting Up Reserve to Cover Incurred But Not Reported Loss Liability. P.C.A.S. XIV, 9.

Matthews, A.N.: A System of Preparing Reserves on Workmen's Compensation Claims. P.C.A.S. XIV, 244.

Craig, J.D.: The Actuarial Basis for Premiums and Reserves in Personal Accident and Health Insurance. P.C.A.S. XVII, 51.

Report of the Committee on Compensation and Liability Loss Reserves. P.C.A.S. XVII, 137, 333.

Roeber, W.F. and Marshall, R.M.: An American Remarriage Table. P.C.A.S. XIX, 279.

Valerius, N.M.: On Indeterminate Reserve Tables for Compensation. P.C.A.S. XX, 82.

Tarbell, T.F.: Incurred But Not Reported Claim Reserves. P.C.A.S. XX, 275.

Informal Discussion: Reserves Against the Recurrence of an Unfavorable Loss Ratio in the Bonding Lines. P.C.A.S. XXIII, 269.

Informal Discussion: Premiums and Loss Reserves for Casualty and Bonding Insurance. P.C.A.S. XXV, 366.

Department of Labor, State of New York: Special Bulletin No. 207, Workmen's Compensation Tables.

Conrod, S.F.: Valuation of Non-Cancellable Accident and Health Insurance Policies. P.C.A.S. XXXII, 27.

The candidate should have knowledge of the provisions of Section 326 of the New York Insurance Law (as re-codified in 1939): loss and loss expense reserves of casualty insurance and surety companies. The convention form of annual statement blank for casualty companies sets forth in Schedule "P" the statutory loss reserve requirements for the liability and compensation lines. This schedule should be studied carefully.

SECTION 14. ADVANCED PROBLEMS IN CASUALTY INSURANCE STATISTICS.

This section includes reading which covers: (a) the planning and use of internal statistical material, and the compilation and presentation of casualty insurance statistics for administrative and rate making purposes; (b) sources and uses of external statistics particularly as they may be required in casualty insurance administration and rate making, and (c) advanced problems in statistical analysis.

(a) Internal Statistics.

In addition to the references cited, the candidate should study the various statistical plans used in casualty insurance. The plans most widely used, and the organizations publishing them, are listed below:

Personal Accident and Health Statistical Plan: Bureau of Personal Accident and Health Underwriters, 60 John Street, New York.

The Unit Statistical Plan and Schedule "Z" for Workmen's Compensation; National Council on Compensation Insurance, 45 East 17th Street, New York.

Standard Fidelity, Surety and Forgery Classification Code:

Towner Rating Bureau, Inc., 60 John Street, New York.

Statistical plans for Automobile Bodily Injury and Automobile Property Damage Liability, Boiler and Machinery, Burglary, Glass, and the respective General Liability lines; National Bureau of Casualty Underwriters, 60 John Street, New York.

Automobile Statistical Plan for Fire, Theft, Comprehensive, Collision and Allied coverages: National Automobile Underwriters Association, 90 John Street, New York.

Automobile Statistical Plans (all coverages): National Association of Independent Insurers, 111 West Washington Street, Chicago, Illinois.

Statistical Plans - Casualty Lines other than Automobile: National Association of Independent Insurers, 111 West Washington Street, Chicago, Illinois.

Michelbacher, G.F. and Associates: Casualty Insurance Principles. Chapters 10 and 11.

Crist, C.W. Jr.: Corporate Suretyship. Chapter 7.

Hobbs, C.W.: Workmen's Compensation Insurance. Chapter 16.

Linder, Joseph: The Function and Place of the Statistical Department in a Multiple Line Casualty Company. P.C.A.S. XIV, 27.

Masterson, N.E.: Statistical Methods for Casualty Companies by Use of the Eighty Column Hollerith System. P.C.A.S.XVI, 288.

Graham, C.M.: The New York Unit Statistical Plan; A Method of Preparing and Reporting Data and Analyzing the Carrier's Business. P.C.A.S. XVII, 190.

Kormes, Mark: A Method of Assembling and Analyzing the Data Reported under the Unit Statistical Plan. P.C.A.S.XVIII, 99.

The candidate should be familiar with the sources of published insurance statistics, so as to know where to obtain such information when the need arises. The following annual publications constitute a representative list of such sources:

Alfred M. Best Co., (New York): Best's Insurance Reports (Casualty and Surety); Best's Reproductions of Principal Schedules from Casualty and Surety Statements; Best's Fire and Casualty Aggregates and Averages.

The National Underwriter (New York): Argus Casualty and Surety Chart.

The Spectator (Philadelphia): The Spectator Insurance Year Book: I. Casualty and Surety Volume; II. Casualty Insurance by States.

The Weekly Underwriter (New York): The Insurance Almanac.

(b) External Statistics.

The candidate should endeavor to become acquainted with as many sources of external statistics as possible so as to know where to obtain the necessary information in connection with the solution of problems arising in the casualty insurance business. The following is a representative but limited list of such sources:

Board of Governors of the Federal Reserve System: Federal Reserve Bulletin (monthly).

Division of Statistical Standards, United States Bureau of the Budget: Statistical Services of the United States Government.

Schmeckebier, L.F.: Statistical Work of the National Government.

United States Department of Commerce: Survey of Current Business (monthly).

United States Department of Commerce, Bureau of the Census: Statistical Abstract of the United States (annually).

United States Department of Labor, Bureau of Labor Statistics: Monthly Labor Review.

United States Department of Labor, Bureau of Labor Statistics: Methods of Procuring and Computing Statistics. Bulletin 326.

United States Department of Commerce, Bureau of Foreign and Domestic Commerce: Distribution Cost Accounting for Wholesaling (Domestic Commerce Series, No. 106).

(c) Advanced Statistical Analysis.

The candidate should be familiar with mathematical statistics and statistical analysis, with special attention to applications in casualty insurance. The first two references cited below are supplementary to the Richardson text cited under Section 1, and will provide the candidate with the mathematical background necessary for a reading of the subsequent references which relate particularly to casualty insurance.

Hoel, Paul G.: Introduction to Mathematical Statistics.

Wolfenden, Hugh H.: The Fundamental Principles of Mathematical Statistics. Chapters I through VI, VIII, IX, XI, VII excluding pp. 75-77 inclusive. Section B, Mathematics and Interpretations, Paragraphs 22-25. Section C, Applications, Paragraphs 7, 17-18, 20-25.

Peters, Stefan: A Method of Testing Classification Relativities. P.C.A.S. XXVIII, 105.

Bailey, Arthur L.: Sampling Theory in Casualty Insurance. P.C.A.S. XXIX, 50 and P.C.A.S. XXX, 31.

Satterthwaite, F.E.: Notes on Mathematical Statistics. P.C.A.S. XXIX, 122.

Bailey, Arthur L.: A Generalized Theory of Credibility. P.C.A.S. XXXII, 13.

Carleton, John: Non-Random Accident Distributions and the Poisson Series. P.C.A.S. XXXII, 21.

FELLOWSHIP: PART IV

SECTION 15. ADVANCED PROBLEMS IN CASUALTY INSURANCE ACCOUNTING.

The candidate should acquire an adequate knowledge of the following:

1. General Accounting. As a prerequisite to a study of insurance accounting in detail, the candidate should be familiar with the fundamental accounting principles, terms and forms as set forth in standard college texts on the subject. "Principles of Accounting" by R.B.Kester is suggested for reading.
2 The purposes, details and sources of the accounts set forth in the current convention form of annual statement blank (with accompanying schedules) for casualty companies.
3. The Casualty Insurance Expense Exhibit and the instructions for its preparation.
4. The adaptation of tabulating machine equipment to purposes of insurance accounting.

Hull, R.S.: Casualty Insurance Accounting. (The particular forms and schedules set forth in this book are in many instances superseded, but the text is important for a discussion of insurance accounting principles.)

Michelbacher, G.F. and Associates: Casualty Insurance Principles. Chapters 20 and 22.

Hobbs, C.W.: Workmen's Compensation Insurance. Chapter 14.

Tarbell, T.F.: Determination of Acquisition and Field Supervision Cost by Line of Business for Casualty Insurance. P.C.A.S. X, 107.

Tarbell, T.F.: Accounting Methods for Casualty Companies by Use of the Hollerith System. P.C.A.S. XII, 215.

Bailey, W.B.: The Allocation of Adjusting Expense to Line of Insurance. P.C.A.S. XIV, 233.

Van Tuyl, H.O.: The Analysis of Expenses by the Use of Hollerith Cards. P.C.A.S. XVI, 121.

Perryman, F.S.: The Theory of the Distribution of the Expenses of Casualty Insurance. P.C.A.S. XVII, 22.

Magrath, J.J.: Valuation of Investments. P.C.A.S. XX, 281.

Barber, H.T.: Compensation Expenses Per Policy. P.C.A.S. XXI, 65.

Waite, H.V.: Distribution of Inspection Cost by Line of Insurance. P.C.A.S. XXII, 15.

Tarbell, T.F. and Waite, H.V.: The Distribution of Casualty Administration Expense by Line of Insurance. P.C.A.S. XXIV, 45.

Tarbell, T.F.: Casualty Insurance Accounting and the Annual Statement Blank. P.C.A.S. XXVII, 294.

Tarbell, T.F.: Exhibits and Schedules of the Casualty Annual Statement Blank. P.C.A.S. XXVIII, 60.

Pruitt, D.M.: Premium Collections on Punch Cards. P.C.A.S. XXVIII, 503.

SECTION 16. ADVANCED PROBLEMS IN THE UNDERWRITING AND ADMINISTRATION OF CASUALTY INSURANCE.

It is strongly recommended that the candidate seek to acquire technical proficiency in the subjects covered under this section by direct discussion, whenever possible, with executives in the various departments of the casualty insurance business. In addition, the candidate should review scientific and professional journals and the proceedings of supervisory and administrative bodies or associations. Illustrative of these materials are the following:

International Association of Industrial Accident Boards and Commissions: Proceedings (annual). Published currently by the United States Department of Labor, Division of Labor Standards.

National Association of Insurance Commissioners: Proceedings.

State of New York, Superintendent of Insurance: Casualty, Surety and Miscellaneous Report. Part III (annual).

State of New York, Superintendent of Insurance: Preliminary Report (annual). (Materials on Casualty and Social Insurance).

The candidate should keep in touch with current developments in casualty and related insurance lines by reading regularly the New York Journal of Commerce and also at least two general insurance periodicals. Best's Insurance News (Fire and Casualty Edition) for the most recent years should be reviewed for articles relating to insurance company investments.

The candidate should review all papers in the *Proceedings* of the Society for recent years which are not cited under the preceding sections. The papers included in the following references are indicated for particular attention:

Michelbacher, G.F. and Associates: Casualty Insurance Principles. Chapters 2, 3, 12, 14-19 and 21.

Hobbs, C.W.: Workmen's Compensation Insurance. Chapter 11.

Flynn, B.D.: Interest Earnings as a Factor in Casualty Insurance Rate Making. P.C.A.S. XIV, 285.

Tarbell, T.F.: Business Cycles and Casualty Insurance. P.C.A.S. XVIII, 253.

Tarbell, T.F.: The Effect of Changes in Values on Casualty Insurance. P.C.A.S. XIX, 1.

Dorweiler, Paul: Policy Limits in Casualty Insurance. P.C.A.S. XX, 1.

Cahill, J.M.: Product Public Liability Insurance. P.C.A.S. XXI, 26.

Report of the Committee on Bases of Exposure for Workmen's Compensation Insurance. P.C.A.S. XXI, 200.

Hobbs, C.W.: Federal Jurisdiction and the Compensation Acts. P.C.A.S. XXIII, 170.

Ainley, J.W.: Problems in Relation to Contractual Liability Insurance. P.C.A.S. XXV, 151.

Vanderfeen, C.G.: Voluntary Plans for Granting Automobile Bodily Injury and Property Damage Liability Insurance to Risks Unable to Secure it for Themselves. P.C.A.S. XXVIII, 471.

Farley, Jarvis and Billings, Roger: An Approach to a Philosophy of Social Insurance. P.C.A.S. XXIX, 29.

Blanchard, Ralph H. Survey of Accident and Health Insurance. U.S. Social Security Board. Bureau Memorandum No. 62.

Blackall, J.C.: Stocks and Bonds as Insurance Company Investments. Proceedings, National Association of Insurance Commissioners, 1936, 91.

Informal Discussion: Investments of Casualty Insurance Companies. P.C.A.S. XXIV, 141.

INDEX TO READINGS

(Books Marked "out of print" are in the Society library)

AUTHOR	TITLE	PUBLISHER
Best's Insurance News	*Fire and Casualty Edition (monthly)*	Alfred M. Best Co., New York
Blanchard, Ralph H.	*Survey of Accident and Health Insurance (Bureau Memorandum No. 62)*	Social Security Administration, Washington, D.C.
Committee to Study Compensation for Automobile Accidents.	*Report to the Columbia University Council for Research in the Social Sciences (1932) (out of print)*	Press of International Printing Company, Philadelphia.
Conyngton, T. and Bergh, L.O.	*Business Law (third edition 1935; revised printing 1941)*	The Ronald Press Company, New York
Crist, G.W., Jr.	*Corporate Suretyship (1939) (out of print)*	McGraw-Hill Book Co., Inc., New York
Division of Statistical Standards, United States Bureau of the Budget	*Statistical Services of the United States Government (1947)*	Division of Statistical Standards, Bureau of the Budget, Washington, D.C.
Department of Labor, State of New York	*Economic Brief in Support of the New York Unemployment Insurance Law (1937)*	Division of Placement and Unemployment Insurance, Albany, N.Y.
Dowling, L. Wayland	*Mathematics of Life Insurance (1925)*	McGraw-Hill Book Co., Inc., New York
Faulkner, E.J.	*Accident and Health Insurance (1940)*	McGraw-Hill Book Co., Inc., New York
Féraud, Lucien	*Actuarial Technique and Financial Organization of Social Insurance, International Labour Office, Series M, No. 17*	International Labour Office, Washington, D.C.
Freeman, Harry	*Mathematics for Actuarial Students; Part II-Finite Differences, Probability and Elementary Statistics (1939)*	Cambridge University Press
Grant, Margaret	*Old Age Security (1939)*	Social Science Research Council, Committee on Social Security, Washington, D.C.
Granville, W.H., Smith, P.F. and Longley, W.R.	*Elements of Calculus (1946)*	Ginn and Co., Boston
Hall, H.S. and Knight, S.R.	*Higher Algebra (fourth edition 1891)*	The Macmillan Co., New York
Greville, Thomas N.E.	*United States Bureau of the Census: United States Life Tables and Actuarial Tables, 1939-41*	Government Printing Office, Washington, D.C

AUTHOR	TITLE	PUBLISHER
Hobbs, C.W.	*Workmen's Compensation Insurance Insurance (1939)*	McGraw-Hill Book Co., Inc., New York
Hoel, Paul G.	*Introduction to Mathematical Statistics*	John Wiley & Sons, Inc., New York
House Ways and Means Committee	*Issues in Social Security (1946)*	Government Printing Office, Washington, D.C.
Hull, R.S.	*Casualty Insurance Accounting (1930) (out of print)*	The Ronald Press Co., New York
International Labour Office	*Approach to Social Security Studies and Reports, Series M, No. 18*	International Labour Office, Washington, D.C.
Jordan, D.F.	*Investments (fourth revised edition 1941)*	Prentice Hall, Inc., New York
Kester, R.B.	*Principles of Accounting (1939)*	The Ronald Press Co., New York
Kulp, C.A.	*Casualty Insurance (second revised edition 1942)*	The Ronald Press Co., New York
Menge, W.O. and Glover, J.W.	*An Introduction to the Mathematics of Life Insurance (1935)*	The Macmillan Co., New York
Meriam, L.	*Relief and Social Security (1946)*	The Brookings Institution, Washington, D.C.
Michelbacher, G.F. and Associates	*Casualty Insurance Principles (second edition 1942)*	McGraw-Hill Book Co., Inc., New York
Moulton, H.G.	*Financial Organization and the Economic System (1938)*	McGraw-Hill Book Co., Inc., New York
National Association of Insurance Commissioners	*Proceedings*	Obtainable from Secretary of Association
New York Insurance Law	*1939, with subsequent amendments*	Banks-Baldwin Publishing Co., Cleveland, Ohio
New York Insurance Law	*1939, with subsequent amendments*	Edited by Paul R. Taylor. Williams Press, Inc., Albany
New York Tax Law	*McKinney's Consolidated Laws of New York, Annotated-Book 59, (1943)*	Edward Thompson Co., Brooklyn, N.Y. (Section 187 in Baldwin's Insurance Law cited above)
Patterson, E.W.	*Essentials of Insurance Law (1935)*	McGraw-Hill Book Co., Inc., New York
Richardson, C.H.	*An Introduction to Statistical Analysis (revised edition 1944)*	Harcourt, Brace & Co., New York
Rietz, H.L., Crathorne, A.R. and Rietz, J.C.	*Mathematics of Finance (revised edition 1932) (out of print)*	Henry Holt & Co., New York

AUTHOR	TITLE	PUBLISHER
Sawyer, E.W.	*Automobile Liability Insurance (1936)*	McGraw-Hill Book Co., Inc., New York
Sawyer, E.W.	*Comprehensive Liability Insurance (1943)*	The Underwriter Printing and Publishing Co., New York
Sawyer, E.W.	*Insurance as Interstate Commerce (1945)*	McGraw-Hill Book Co., Inc., New York
Schmeckebier, L.F.	*Statistical Work of the National Government (1925)*	The Brookings Institution, Washington, D.C.
Sinai, N., Anderson, O.W., and Dollar, M.L.	*Health Insurance in the United States*	The Commonwealth Fund, New York
Skinner, E.B.	*Mathematical Theory of Investment*	Ginn & Co., Boston
Social Security Administration	*Comparison of State Unemployment Compensation Laws (latest edition)*	Social Security Administration, Washington, D.C.
Social Security Administration	*Compilation of the Social Security Laws (latest edition)*	Social Security Administration, Washington, D.C.
Stewart, D.M.	*Aviation Insurance (The Casualty Educator, Vol III) (1946)*	The Underwriter Printing and Publishing Co., New York
Stone, H.F.	*Law and Its Administration (1924)*	Columbia University Press, New York
U.S. Social Security Board	*Disability Among Gainfully Occupied Persons (Bureau Memorandum No. 61)*	U.S. Social Security Board, Washington, D.C.
U.S. Social Security Board	*Social Security in America (1937)*	U.S. Social Security Board, Washington, D.C.
Whitworth, W.A.	*Choice and Chance*	G.E. Stechert & Co., New York
Willet, A.H.	*Economic Theory of Risk and Insurance (1901) (out of print)*	Columbia University Press, New York
Wolfenden, Hugh H.	*The Fundamental Principles of Mathematical Statistics (1942)*	The MacMillan Company of Canada, Limited, Toronto, for the Actuarial Society of America, New York