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NOTICE

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

"History, like life, must be continuous or die: character and institutions may be altered, but slowly; a serious interruption of their development throws them into national amnesia or insanity."

—*Will Durant.*

"Science writes of the world as if with the cold finger of a starfish; it is all true; but what is it when compared to the reality of which it discourses?"

—*Stevenson.*

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PROCEEDINGS

NOVEMBER 15, 1940

AVERAGING IN CASUALTY INSURANCE

PRESIDENTIAL ADDRESS BY FRANCIS S. PERRYMAN

There will possibly be some who will consider that the title of this address contains a certain amount of redundancy, for, they will say, is not insurance wholly a matter of averaging. Basically this is so, but of course there is a good deal more to insurance than mere averaging; what I want to do, however, is to invite you to give your attention to some of the considerations that underlie this basic process of averaging. All of us, I suppose, in whatever field our activities may lie, take many things for granted because of long familiarity with them, and we are often a little surprised, when we take the time to do it, to find how beneficial can be a re-examination of fundamentals. Sometimes we are led to this re-examination by the elementary questions of some one not familiar with our field of work; who therefore does not take for granted all our "self-evident" principles: sometimes an occasion such as an address to our professional Society may start us exploring the fields through which we are accustomed to proceed, swiftly and scarce heeding, along well-trodden paths. This address will have fulfilled its object if it is such an occasion. I do not mean to imply that I happened to cast around for a topic on which to speak and said to myself, "It would be a good idea to talk about averaging—it would benefit the members to have to listen to such a discussion and one day it might turn out to be of real practical value." Of course not. Today, when so much of the world is topsy-turvy and the spirit of change, or even more than change, complete re-arrangement, if not revolution, is in the air as respects our social, political and economical life, we in our business and professional lives find ourselves coming up against ideas, thoughts and questions, many of which can be grouped together because in the language of this address they are concerned with this process of averaging. In other words, this question of how to average is in the air.

To allay the fears of some of my less mathematically minded friends let me hasten to make it clear that I am not going to discuss mathematical averages, arithmetic, geometric or harmonic, unweighted or weighted, or what have you. All I mean here by averaging is the fundamental process of insurance, the spreading of the risk and the determination of the proper manner of charging for the insurance. If I were writing a comprehensive treatise on the subject it would take me considerable time to get going, for it would be necessary to give appropriate definitions to insurance, coverages, considerations, premiums and so on: but since my object is to present thoughts on certain aspects of averaging, I can proceed much more quickly to those aspects. Books on insurance start by defining insurance and then subsequently explain how it is necessary to do a certain amount of grouping for the purpose of equitable treatment of the various persons insured: then there must be appropriate measures of the hazard and thus we get the genesis of some of the most useful technical methods used in insurance, namely classification, and the use of exposure bases. A simple example such as the following may be given to illustrate.

Take the case of fire insurance on a group of cottages in a village. If these are all similar—of the same size, construction and circumstances with respect to fire hazard—then it would be reasonable to charge equal premiums for each cottage for complete fire coverage. The actual amount of the appropriate premium would have to be determined by experience, but the point here is that each cottage should be charged the same amount. Now suppose another cottage of just twice the size and value of each of the others; then the theory would be that the chance of a fire was the same for every cottage but that a fire would do twice as much damage in the big cottage and so the premium for it should be twice that for each of the others. Similarly, if there were other cottages of varying size or value, the premiums should vary according to the size or value; in this case the basis of exposure is the size or value of the cottage, being the measure of the degree of the insurance hazard. The essential thing in this case is to find a basis of measuring the size of the insurance hazard in a group of risks similar except as to variation in size. The premium for each building would be fixed by applying a "rate" to the "exposure" for the building. Now to return for a moment to our village, let

us suppose that there was another group of buildings of different construction, location, use, etc., such that the fire insurance hazard was uniform as between each member of the second group but considerably different from that of a similarly sized or valued cottage in the first group. Then each of the buildings of the second group should take the same premium, but this would be different from the premium for a similarly sized cottage in the first group—how different would have to be determined by experience or by consideration of factors such as type of construction, exposure to fire hazard and so on. Within this second "classification" of buildings might be buildings of different size or value, so that as in the case of the first group or classification we would set up a rate for the class and apply this rate to the exposure which would measure the size of the hazard. We might have still other classes of buildings in the village, each of which would have its own rate. So the premium for any building would be fixed by determining the "classification" to which the building belongs and applying the rate for that class to the "exposure" for the building.

This illustration is of course of an ideal simplicity rarely encountered in practice. It serves, however, to bring out the qualities we should have in our conceptions "classification" and "exposure." All the "risks" within a given class or classification should be homogenous except for the variations in size which are measured by the exposure. I do not intend to give any precise definitions of these terms "class," "exposure," etc., particularly as their use and meaning varies somewhat in different kinds of insurance. I intend generally to give them the significance they have in casualty insurance. It will be observed

(a) that the degree of homogeneity attained within a class can never be absolute since no two risks are exactly alike, and as a matter of convenience we must in practice avoid too great a multiplicity of classes and so make reasonable groupings; our classes, however, should be reasonably homogeneous.

(b) There is a certain amount of interdependence between class and exposure: the use of exposure permits of the use of a smaller number of classes with larger numbers of risks in each. Thus, to take the village illustration, instead of regarding the first group of cottages as one class with mem-

bers of varying size we could have taken each size of cottage as a separate class with an appropriate premium. Further, the choice of a suitable exposure basis can materially simplify our problem of selecting classes. For example, if it were found that the premiums for every building in our hypothetical village varied according to some physical measurement, say floor area, we could throw all the buildings in one class and set a rate per square foot of floor area.

The problem of how to set up proper classes and proper exposure bases has been discussed by various writers on insurance. Some attention has been given to the question in the *Proceedings* of this Society; for some not very apparent reason, rather more attention appears to have been given in our *Proceedings* to "exposures," though this is only one part of what is really a single subject. In practice, the setting up of classes for a new kind of insurance is initially a matter of judgment and trial and error. The initial choice can be checked later when experience is collected. It must be confessed that most of even our elaborate casualty statistical systems do not always help as much as might be anticipated: they will often furnish a guide to the combination of existing classes but normally do not give much help in deciding whether a given class is sufficiently homogeneous. This is because experience is usually collected on existing classes, and unless much finer statistical divisions are made we can discover desirable subdivisions of non-homogeneous classes only by underwriting observation and judgment. Theoretically we might get some of this information by the application of modern statistical theories of dispersion and sampling: at any rate we could see whether a class was homogeneous or not, but in practice our statistics are subject to so many disturbing influences that these theories are rarely appropriate for this purpose.

When we consider the complexity of modern life we can readily understand that in order to take care of the many varieties of risks that arise even in respect to a single major kind of insurance it is necessary to set up a large number of classes. Various devices have been developed to keep the number of separate classes within manageable limits: most of these are in the nature of the setting up of a comparatively small group of large classes, not so homogeneous as we would desire, and then having a procedure for

dividing each class into sub-classes: we have a basic rate applying to each class, such rate being appropriately modified for each sub-class. These devices include our familiar instruments of schedule, experience and merit rating. Thus our scheme for the application of averaging to developing rates for individual risks consists of:

(a) first of all deciding the overall amount we should collect for all the risks to be insured—in other words determining the rate level
(b) dividing the risks into broad groups or classes each with an exposure base and determining how much is to come from each—in other words fixing the relativity of rates between the individual classes
(c) fitting the rates to the individual risks in each class by the use of schedule, experience or merit rating or other appropriate device.

It will be well understood that the above formal procedure will be the full procedure for a major species of insurance: for a smaller kind of insurance the procedure will not be so formalized: some of the steps will be impossible to carry out and rates for individual classes or even risks may be set by considering the experience of the individual class or risk or else on the basis of underwriting judgment. However, this does not vitiate our line of reasoning, for here we are concerned with the principles that would be followed if a sufficient amount of business and experience was available to allow of the full application of the fundamental insurance procedure of averaging.

The above is a sketch of what may be described as the classical theory of averaging: let me hasten to emphasize that is only a sketch—it does not pretend to be more than sufficient to indicate the outline of the theory that is familiar to all of us, although like many of the fundamentals of our business this process of averaging is taken too much for granted by all of us, and it is only rarely we have the occasion and take the time to think about it. My reason for confining myself to such a sketch is that I intend in this address merely to call your attention to some of the difficulties in the practical use of the theory. By "classical" theory I intend of course to mean the generally accepted and time-honored, settled or supposedly settled body of thought on the subject. To this I should append the observation that the theory sketched is

primarily applicable to commercial insurance and may require modification for social insurance—I shall return to this point later. First, however, let us consider the expense portion of insurance premiums. The theory of averaging given above is concerned only with the proper premium for insurance hazard, or in other words with the pure premium: but the insurance carrier has of course expenses, and it is necessary to determine, not only what these expenses are or will be, but also the incidence of these expenses and how expenses should be charged against the various risks. In casualty insurance we usually talk about the expense loading and generally assume that this is a percentage of the pure premium or of the final premium, but it is not at all certain or even prima facie probable that this is the correct method of loading: to assume that loading means such a percentage is to beg the question and illustrates how a habit may mislead us. As many of you know, the first kind of insurance I first grappled with in my business career was life insurance, and in the course of my actuarial studies in England we first dealt with net premiums (in other words pure premiums) and then proceeded to consider "office premiums," this being the rather quaint name for the final premiums to be charged. The normal or basic method of loading was revealed to be "a constant and a percentage" or in the notation suggested by Mr. Carlson (P. C. A. S., Vol. XX).

$$P = \alpha p + \beta$$

where α is the proportional or percentage part of the loading and β is the constant (do not confuse this "constant" as used here with the policy constants, e.g., loss and expense constants used in casualty insurance—the constant here is an addition to the pure premium). This formula seemed to us students to be quite reasonable since there were some expenses of life insurance companies that obviously varied as the sum insured (and had no relation to the size of the pure premium)—such expenses as the policy stamp and the agent's first year's commission, both of which were so much per unit of sum insured. Then there were other expenses that varied decidedly as the premium—such as the agents' commissions on renewals: and as regards other more general expenses it seemed reasonable to allot some into the first category and some into the second. Apart from discussions as to how much of the expenses should be charged as "constant" and how

much as "percentage," about the only other basic principle discussed was whether the expenses should not be varied according to the policy size (i.e., the size of the sum insured or of the final premium, not the size of the premium rate). It was generally conceded that large policies could be handled rather more cheaply, proportionately, than small ones but in practice all that was done was that some companies had some special low rates that were applicable only to policies of over a certain size. (It may not be amiss to mention here that in England life insurance rates, or other insurance rates for that matter, are not subject to any governmental control.)

When later I came to study casualty insurance in this country I found that the current loading formula was slightly different—the "constant" being missing and the formula being

$$P = \alpha p$$

Further I found that for many people this formula had acquired a kind of sacredness, so that even to think of modifying it was anathema. I probably would not have said so much about the contrast between the basic life insurance loading formula and the basic casualty formula had not I been reminded of it twice within the last month or two by suggestions that were made to the effect that possibly some of the loading of casualty rates should be put in as a function of the pure premium. So in effect I am here recording that if the casualty business "develops" the loading formula

$$P = \alpha p + \beta$$

I shall already have had some acquaintance with it.

During the years since I came into casualty insurance we have seen development of other ideas regarding the proper loading of casualty insurance rates, most of which have the effect of "graduating" the loading so that the final effect is to load the larger premium sizes (not premium rates) proportionately less than the smaller. We have seen the introduction of expense constants (and loss constants as well), graduated commission and expense loadings, and other schemes (e.g., retrospective rating) where the expenses are charged otherwise than according to the "standard" (flat percentage) basis. I would have liked, and originally intended, to give examples of the formulas for such expense loading plans so that you could contrast them with the simple "stand-

ard" formula $P = a\ p$: but the mathematical formulas are complex and so I regretfully omit them. However, I am getting ahead of my story: before discussing how rates are loaded we should first go back and examine the incidence of expenses so as to make up our minds as to the kind of loading plan we ought to adopt. The underwriting expenses of casualty insurance carriers consist of many different varieties: they may be conveniently divided into commissions to producers, cost of the acquisition of business, taxes, cost of settling claims, cost of inspections and safety work, cost of making payroll audits and the general expenses of underwriting and administering the business. Since a carrier may, and often does, transact many varied kinds of business and in many different states, it is not a simple problem to allocate the expenses properly so that it can be determined how the various kinds of insurance in the various territories should be charged with their proper share, and, to carry the process a stage further, how to ensure that the premiums for the individual risks are loaded with an equitable amount for expenses. Remember that this part of the discussion assumes that the risk portions of the premiums (net premiums, pure premiums or whatever they may be called) have been properly and fairly determined—an assumption that, as indicated above, is only approximately realized in practice.

Some of the expenses are comparatively easy to apportion—for example, commissions or even total acquisition costs may be payable as a percentage of premium: the percentages may vary for different types of risk, it is true, but it will be known what the percentage is for any given risk. Similarly, premium taxes may be and usually are a definite percentage. For other types of expense, other principles may well be found to hold: for example, claim expenses may for a particular kind of insurance be found to be proportionate to the losses. Certain expenses, e.g., payroll audit costs, may be peculiar to certain types of insurance and so of course should be assessed against only those types. In general however, a proper allocation of expenses—whether to major lines of insurance or to particular classifications within a line or to particular states or other territorial divisions or to particular types of individual risks—cannot be made from theoretical considerations or by taking thought, even enormous quantities of thought:

no, a great amount of investigation has to be undertaken. Our *Proceedings* contain a number of papers on this expense allocation question; on the proper principles upon which investigations should be founded as well as on the most suitable practical methods and mechanics that should be and have been utilized. The problem is undoubtedly a difficult one and one which has not yet been attacked as thoroughly or as successfully as the collateral one of the determination of pure premiums, i.e., the proper charges for the insurance risk. Indeed, up to a fairly recent time, not a great deal of attention was paid to the expense end of premium determination—the usual procedure being to ascertain roughly the expenses, for the major lines of insurance, and then to load all pure premiums for that line by one flat percentage loading —making a few exceptions for particular subdivisions of the line where an obvious departure from this proceeding was clearly indicated, as for example if different commission rates were by custom allowable. It should be mentioned here—if only merely to show that I have not overlooked it—that in some lines of insurance, such as elevator and boiler, where the inspection service is a major, if not the major, benefit of the insurance contract, the inspection cost is treated more nearly along the lines of the loss cost; although even here the methods used were at first comparatively crude and have only recently been somewhat improved: despite which perfection has not been yet attained, by a long way.

Now let us suppose we have investigated and ascertained how casualty insurance carriers' expenses are properly distributable. Then we should "load" our pure premiums accordingly so that each policy provides the proper expense loading: this should be done along the same lines as pure premiums are determined, that is to say, by a similar process of averaging. We can't pretend to make premium rates so that the expense portion will exactly pay for all the expenses properly belonging to the single policy any more than we can hope that the "pure premium" portion will provide exactly for the actual losses: what we aim at of course both in the case of the pure premium portion and the expense portion of the premium is that in a large group of similar or homogeneous policy contracts the pure premium portion and the expense portion will balance the actual losses and the actual expenses. Some policies will, in any particular year, have a heavier incidence of

losses than others, and the same is true for the expenses, but over all, and in the long run the pure premium and the expense portion should be fair averages. What I mean by fair averages and why it is so essential that the rates are fair averages I will discuss more fully a little later.

Before closing this discussion of expense loadings, however, I want to go back for a moment—go back, that is, in the logical presentation of the subject—and briefly touch on another aspect of the expense element that perhaps should have been considered before investigating the proper distribution of expenses. The expenses I have been talking about are, or at any rate I have implicitly taken them to be, the *actual* expenses incurred by insurance carriers: it is pertinent however to raise the question of how much these expenses should be, or at any rate whether there are or should be any brakes or checks so as, for example, to prevent them from being unreasonably high. The theoretical answer to "how much" is, no doubt, that the expenses of a carrier should be enough to enable the carrier to give efficient service and should be no more: this is of course very indefinite, for who is to say what is efficient service, and who is to say how much it takes to provide that? Further, there is room for considerable difference of opinion as to how much "service" should be provided by the carrier, particularly as regards some forms of service. It might not be too difficult to set up standards of, say, claim service or at any rate it might not be so difficult to set up such standards as to set up standards for, say, accident prevention work—for in the case of claims the (usual) policy contract calls for the handling of *all* claims matters by the carrier, but as to accident prevention the very extent or degree to which such service should be provided can easily be debatable, to say nothing of the difficulties of agreeing on the value of such service, measured in terms of expense loading. Then we can have even more indefinite questions, such as, for instance, the extent to which carriers should engage in research work and in fact the level to which all the more general expenses of the carrier should be pitched. A few expenses are, for the purpose we are at the moment discussing, quite definite; for example, premium taxes. Commissions are often considered in this category since the percentage of premium paid as commission is usually definitely fixed: however, of late years this acceptance

of traditional commission rates has been challenged, the view being advanced that this item of cost should be subject to the same kind of critical scrutiny with a view to verifying its value to the purchaser of the insurance.

We are, nevertheless, not left entirely without any checks or brakes on the expense portion of our insurance premiums—in fact, we have a very powerful check, namely the salutary effect of competition—save in the case of monopolistic insurance, which we will leave aside for the moment. This effect of free competition between different types of carriers and between individual carriers operates, and in much the same way, not only in the direction of acting as a curb on the level of expenses, but also in the direction of requiring continual attention to the proper application and use of the principles discussed earlier of averaging the loss and expense portions of insurance premiums. Many of you, quite understandably, may have said to yourselves, "The theories set forth as to how we should spread loss costs equitably over the various classifications and individual risks, and as to how we should determine accurately the proper distribution of expenses and charge such expenses accordingly—these theories are doubtless good theories, *but* do we have to go to these extremes; do we have to have all these refinements; haven't we got to be practical as well as theoretical? Can't we short-cut some of these no doubt correct but yet burdensome detailed procedures? What difference does it make in the long run if we have only rough justice between various classes and types of risks?" The answer to all of this is competition. If we have only rough justice instead of correct scientific equilibrium in the premium charges for different classes, along will come competition in the shape of some wideawake rival carrier. This holds equally for loss costs and for expense costs: and a similar consideration operates in respect of the level of expenses: if proper and adequate service can be provided at a certain expense level, any group of carriers with higher costs will find competitors springing up ready to supply the service at the economic cost level. The same is true regarding services supplied or offered that the public does not regard as necessary: all service charged for must be capable of being, and must be, justified: this includes the service rendered by the business producer (regardless of the type of sales organization utilized).

The cost of "producing" business amounts to a considerable share of the premium for the very considerable service rendered the insureds: nevertheless unless the cost of the service is coordinated with its value, the inexorable laws of economics will inevitably operate to do so, and most thinking people will agree that it is better that the parties concerned should not close their eyes or minds to the realities of the situation but should ever be on the alert to rectify any maladjustments in the current system.

Competition makes its effects felt in casualty insurance in the same way as in any other field: if the price is too high the business goes elsewhere. If a carrier—or a group of carriers—erect a schedule of rates where the level is too high, say on account of too great an expense loading, competitors quoting rates at a more reasonable level will attract most of the business and the schedule of too high rates will have to be revised downwards if the users of it are to stay in business. This, however, is not the only or even the most common case: if the schedule of rates is not constructed on proper scientific lines as regards either the loss or the expense elements, the charges for some kinds of risks, maybe those of some classifications, or those in some territories, or those of some sizes, will be too high, and others will be too low. Competitors will seize on the inequalities and will set out to write at lower, but yet profitable, levels, those risks for which the rates are too high. The first carrier will be left "holding the bag" in the shape of the other risks at inadequate premiums. To take an obvious example, many of the difficulties of the big "standard" countrywide carriers in the writing of third-party automobile insurance on private passenger cars can be directly attributed to the difficulty of devising proper rating schedules for such risks: in the main, up to recently, rates in any given territory were nearly flat, i.e., the same rate was charged for any car, whereas as a matter of fact the actual insurance risks varied considerably. This was an ideal set-up and invitation for competition: the "standard" carriers were of course aware of the unevenness in their rates and of the dangers to which they were exposed thereby, but the difficulties of the problem of proper rating are great and have not yet been overcome. One beneficial result of the resulting competition will be the evolution of more satisfactory rating methods. Competition thus operates to correct two kinds of con-

ditions—namely, first, where the whole level of rates is too high, i.e., where the averaging behind the rates produces an overall average which is uneconomically high; and, second, where the rates are not fair or equitable as between the various risks, i.e., where the averaging has not been properly done. This influence of competition as a check on proper prices or charges for goods or service is, of course, not exclusive to insurance: the situation is no different in essence from the effect on pricing in any other commercial undertaking under a freely competitive capitalistic system: our "goods" are rather more intangible, consisting of "service" and promises to pay in the future, but the theory, and practice, of competition is the same as anywhere else.

We have not, however, exhausted the subject of the effect of competition. I have so far implicitly assumed full and free competition. We have, however, in casualty insurance, instances of a rather different and more restricted form of competition. This occurs in the case of kinds of insurance the rates for which are "regulated." All insurance carriers in this country with scarcely any exceptions are controlled or regulated in the sense of having to fulfill certain requirements, usually mainly financial, and of being subject to certain other restrictions or regulations—all for the protection of the carriers, the insureds and the public at large. I am referring, not to this kind of general regulation, but, as I specifically said, to "rate regulation." The kind of insurance in our field where rate regulation has been most widely used is that of workmen's compensation insurance, but there are examples of such regulation in other kinds of insurance, and indeed the tendency seems to be for this kind of state control to be used more and more widely. The usual method is for the rate regulation to be entrusted to the insurance department or some other public body and for all carriers to be compelled to agree on and file a common schedule of rates which are, upon approval, compulsory on all carriers, although in some instances individual carriers are allowed to apply for deviations from the common scale. Thus, in general, for each risk a certain premium is set up which all carriers must charge: under such a system it becomes even more essential for the rates to be "right," not only on the whole, but as between individual risks, since the free play of competition is prevented from acting to correct any inequities: if for a given risk the

charge is, in reality, too high, there is no remedy available to the risk—no competing carrier can come along and offer a more reasonable premium. Rate regulation, therefore, unless it sets a proper scale of rates, correctly founded on the principle of proper averaging, will produce grave consequences. Carriers are not homogeneous: there will be various kinds: stock, mutual and competitive state funds; local companies and carriers operating countrywide; and so on. These will obtain their business from various sources; some will have risks predominately from one kind of industry and some will have a more general distribution: some will have risks of a small average size and some risks of a large average size: some will secure selected risks by discriminate direct selling and some will serve a wider cross-section of the state by writing through agents doing a general business. Now if the charges for the various classes, kinds, sizes and locations of risks are not equitably balanced, the effective rate levels for the actual portfolio of business written by the various carriers will be too high for some and too low for others: and this applies to all elements of the rates, the expense loading as well as the loss provision. There will inevitably follow serious friction and partisan disputes. Unfortunately, the way to avoid this, and indeed the necessity of doing so, about which there should be no dispute, has not been generally recognized or admitted. The necessary corrections to the rating system called for by the certain consequences of ignoring the principle of proper rates have been made only in the face of strenuous opposition. With the advance of scientific rating the loss provision element of the rates has been reasonably well perfected, although not without some struggles, but the most strenuous battles have been fought over the expense provisions. I do not desire to enter here in controversial issues: my position regarding the justice of properly fitting all parts of rates to the actual circumstances of varying individual risks I have already made quite clear. Most of the controversies have centered around the "anti-discrimination" provisions of the insurance laws of many states, and analogies have been drawn between these and recent social legislation. My view is, that as regards the insurance rate disputes, distinction has not been clearly drawn between fair discrimination (this being the essence of proper rating) and unfair discrimination, which latter is the real and deserving

target of both insurance and other social legislation. Fortunately, the situation is improving and strides have been made toward making regulated rates fair rates. Some of the confusion regarding the application of anti-discrimination laws to expense provisions has been cleared away: for instance, the new New York Insurance Law effective this year provides that "no rate shall discriminate unfairly between risks involving essentially the same hazards and expense elements."

This brings me to the end of my survey of the present state of the application of proper averaging conceptions to casualty insurance rates; it appears that, as far as the loss portion of the rate is concerned, considerable progress has been made, but that we have not got so far in regard to the expense provisions. However, it is gratifying to note that continued attention is being given to the equitable charging of expenses. One of the points I have desired to emphasize is, that the whole of the premium should be based on sound and equitable averaging, it being just as important to get the expense loading equitably applied as it is in the case of the loss provisions. Consistent use of this principle would require that similar attention should be given to any other factors that enter into the make-up of the final cost to the insured. To give just one example: the dividends of participating companies should be apportioned in equitable recognition of the sources of the profits: as in the case of expense loadings the practice to date appears in general to make the dividends flat percentages of premiums, although it is by no means certain that this is the most equitable procedure.

So far, all my discussion of this question of the proper principles of averaging have been concerned with "commercial" insurance, meaning thereby insurance undertaken by carriers operating under the profit motive and under the capitalistic system. For such "commercial" insurance the guiding basic principle is that the price must be measured by the cost. "Social" insurance, however may, and usually does, involve different considerations, which may, and again usually do, operate in the direction of much greater simplicity. It is of course obvious that scales of rates for commercial insurance, constructed in accordance with the principle of cost determining price, will have to be of a very great complexity because of the complications of modern social and in-

dustrial life—and the more the science of rate-making is developed the greater will be the complexity of rate schedules. On the other hand, in the case of social insurance, comprising in essence the provision of benefits for various forms of social accidents or disabilities through a carrier which is the state itself or a public monopoly, it is usually thought not to be necessary to apportion costs so exactly, particularly since in many instances part of the cost is provided out of general public funds. This state of affairs is not peculiar to insurance furnished by the state. Most of the other public services are similarly charged against the beneficiaries in a very rough and ready manner—and often charged against taxpayers generally regardless of whether they individually are or are not beneficiaries. Many public services, for example, police protection, are of such a nature that exact apportionment of the cost, even if desirable, would be very difficult, probably even more difficult than to determine proper insurance charges. And indeed I do not intend to argue that such social services, whether insurance or otherwise, require exact scientific charges, matching dollars of cost with dollars' worth of service individual by individual. The doctrine of the common good fully covers the procedure of providing such service partly from general public funds and partly from special funds raised by special taxes, the incidence of which coincides but roughly with the distribution of the benefits; and modern social theories as to the extension of the duty of the state to provide wider and wider forms of security for the citizens certainly give us still greater latitude. As a result, social insurance, freed from competitive necessities and based on social needs and public concern for the welfare of all kinds and conditions of men, can achieve a great simplicity as regards "premiums" and thereby eliminate some of the administrative costs, namely, those concerned with rate-making, apportionment of costs and so on. It is interesting to note that in this country—where commercial rate schedules have been developed to a degree and complexity greater than almost anywhere else—full advantage has not, so far, been taken of the possibilities for simplification in the charging for such social insurances as have been put into effect: many other countries have social insurance schemes considerably simpler. Some of this no doubt arises out of our relatively complicated political struc-

ture and the wide variations in local conditions throughout the country: further, social insurance has been instituted here only in the past few years and it is certain that simplifications will be made—they will have to be. Thus a great deal of the above theories of averaging, made with "commercial" insurance in mind, will have to be greatly modified for social insurance. The structure of social insurance is so entirely different that wholly different theories will be called for; the very entities to be averaged will be different. I do not propose to discuss further the subject of social insurance; even if I were qualified to do so I would not have the time.

One advantage of an address such as this I have before remarked on: it is that I am not required to discuss anything completely—I can pick and choose, start where I want to and finish where I please. You will have noticed that I avail myself of these privileges: nevertheless I have tried to preserve some semblance of order in these remarks so that they may fall on your ears in a manner that can be defended as logical. It has, as always, been a great pleasure and of considerable benefit to me to take the time and thought to set down these ideas in what I hope is a reasonable sequence. In conclusion I express the hope that these remarks, regardless of their intrinsic worth, may bring you at the very least the benefit that will come from their having been the occasion of your directing your thoughts, first, to the fundamental ideas underlying the application of the process of averaging to casualty insurance, and second, to some of the consequences that follow failure to do this averaging properly.

A 1940 VIEW OF NON-CANCELLABLE DISABILITY INSURANCE

BY

JARVIS FARLEY

Non-cancellable disability insurance, despite an arduous past, is being written today with apparent success by a small number of companies. In the past the insurance has often been associated with unlimited life-time coverage, either as separate non-can[1] policies or as disability income provisions in life insurance policies. Such association is not necessary. Very little non-can is now written on a life indemnity basis—none on an unlimited life indemnity basis. Almost all of the new policies issued today place a limit to the period of coverage varying from eight or ten years to little over a year. Such limitation of the disability term is important as a symbol of the greater attention being paid to the intangible aspects of non-can underwriting.

With the benefit of hindsight we know now that there is no single disability experience standard. There are subtle, intangible elements in the conduct of non-can, and variations in the treatment thereof can make the difference between a safe or a disastrous experience. The general aim of this paper is to present a basis for an understanding of these intangibles. There is no practical value in a discussion of the mathematical aspects of the non-can actuary's functions unless it is based upon such an understanding. Considerable attention will therefore be devoted to the three major hazards of insurance—moral, physical and legal—as they affect general non-can underwriting practices.

Background

The distinctive feature of a non-can policy is the surrender by the company of any active right to terminate the policy during the

[1] This common abbreviation is used throughout the paper in order to avoid cumbrous repetition of the term "non-cancellable disability insurance."

major part of the policyholder's productive lifetime. There are several types of non-can policies of which life indemnity was one extreme. The common prejudice against anything labeled "non-can" springs largely from the experience with life indemnity, which without significant exception has caused every black mark in the record. It is still possible to obtain life indemnity in connection with the life insurance policies of a few companies, and there are non-can policies setting no limit to the period of indemnity so long as the insured is strictly confined withindoors. Most policies, however, have the limit mentioned above, and a waiting period varying from a few days up to three months is almost universal.

Non-can, and its cousin the life insurance disability clause, were born of the public's need for a permanent form of protection against loss of income. The average family is founded economically upon the earning capacity of the paterfamilias. There are three insurable hazards which threaten to destroy that earning capacity—death, old age, and disability. All three hazards involve life contingencies, and there was a strong logic behind the attempt by the life companies to expand their function to include insurance against all three. The casualty companies also had a certain logic in their adoption of non-can. They had long written restricted cancellable health and accident coverage, and the discontent created by restrictions and by the necessary and proper exercise of the right of cancellation led many underwriters to dream of a policy which would cover all bona fide disabilities—one which would not create the dissatisfaction which results from cancelling the policy just when the insured most urgently needs the protection. The obvious need for such a policy, and the strong desire of the companies to fill that need, set the stage for the headlong rush into the field which followed the breaking of the ice in 1915. The errors which competition injected into early underwriting practices are just as understandable as they were unfortunate. Two important lessons have been drawn from that early experience—that the very real need for broad, permanent disability income insurance creates a fertile field for the coverage which can meet that need; and that the field is crisscrossed by moral hazards which must be solved in order to underwrite the insurance successfully.

The Need for Non-Can

The need for disability insurance has its roots in the importance of earned income to the average individual in our economic order. There are material necessities with which every family and individual must be provided in order to sustain life. The quality of food, shelter and clothing which each individual will consider to be his necessary minimum will vary with the individual's background, economic experience, and moral stamina; yet the requirement exists for everyone and must be paid for in some way, even if berries, a cave, and a set of fig leaves would satisfy the respective needs. They may be paid for by one's own current efforts, by savings or inherited property, or by assistance from other people or from a government agency. The individual who wants to avoid such assistance and has limited savings or inheritance must rely on his current capacity to earn. If his earning capacity be impaired, outside assistance is his only alternative unless that earning capacity has been insured.

This qualitative aspect of the need for disability insurance, although simple and elementary, is subject to variations. In some cases income stops the instant the earner is forced to leave his work. In such cases the need is for immediate commencement of benefit payments. Sometimes a salary may continue for a few weeks or even months in spite of disability. In such cases there may be need for immediate hospitalization or medical insurance, but there is no need for immediate disability insurance as such. Here the need is for insurance with a waiting period matched to the period of salary continuation. These are the extremes of the inception of the insurance, with all gradations between. Different waiting periods make it possible to fit the insurance closely to this aspect of individual needs.

Once the loss of income becomes actual, it continues until recovery reestablishes the capacity to work, or until death transfers the burden to the life insurance field, or until the disability becomes so fused with superannuation that the line is difficult to draw. To what extent can today's limited policies meet the need created by such continuing loss of income? The old-time unrestricted life-indemnity policy intended to provide a substitute income as long as total disability lasted, but the modern policies have no such intention. A two-year policy buys no bread in the

third year of disability, and even a ten-year policy fails to provide an income throughout a disability which outlasts the decade.

Adequacy of Limited Non-Can Policies

In spite of the apparently drastic limitations the modern policies do not fall seriously short of affording full protection against the fundamental hazard. In the first place, long-term[2] protection at modern rates is not cheap, and possible applicants for complete protection form an extremely small proportion of all prospects. Most prospects, being unable or unwilling to purchase complete coverage if it were available, must necessarily adapt their coverage to their means. From this practical viewpoint the broadest part of the field is fully served by policies providing no more than two years of coverage. Since these prospective assureds make no use of the facilities available for longer-term coverage, the lack of unlimited coverage can be no hardship to them.

Another large group of prospects is actively interested in the coverage out to eight or ten years. This group is made up in part of those who have already covered the shorter-term hazard and can afford protection against the longer disabilities, and in large part of those whose financial position permits them to disregard the first few weeks of disability and thereby concentrate their premiums on longer coverage with a greater waiting period. According to the Conference Modification of Class (3) Experience a two year policy covers almost two-thirds of disability, and less than one-fifth of all disability lies beyond the scope of a policy paying for 100 months. If it were possible to get a table which expressed true physical and mental disability, eliminating all malingering and superannuation, it would show that there is only a very small proportion of true total disability which cannot be covered by the policies available. That small part attracts and encourages pseudo-disabilities and retirement claims to such an extent as to make the underwriting thereof on any adequate scale

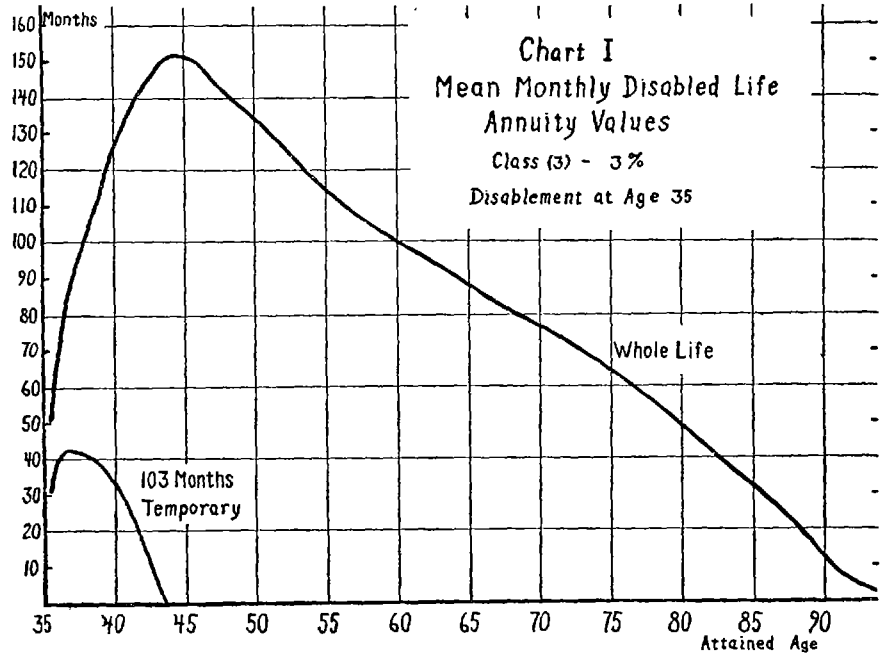
[2] The word "term" has two applications in non-can insurance, and both are used in this paper. One is the period during which the policy may be kept in force, and the other is the period of disability to which the payment of indemnity is limited. The phrase "long-term" as used here refers to the limit of indemnity. In general the application will be apparent from the context.

apparently impossible, but the protection which can be secured covers by far the greatest part of the field and is a real contribution to the fundamental social need.

Effect of the Limit on the Moral Hazard

The indemnity limit was characterized above as a symbol of the attention given to the moral hazard by the companies now writing non-can. That limit is one of the important factors making possible the underwriting of non-can insurance. One of the most serious moral hazard aspects encountered under life indemnity policies was the temptation to retire permanently to live on the proceeds of the policy. According to Class (3) the average number disabled for more than one year is between two and three out of every thousand life-years exposed. The average Class (3) select life annuity value at the end of the first year of disability is equal to about six years of indemnity, so a significant change in that frequency is obviously a serious matter. The frequency can be drastically altered by a few claimants whose lack of moral stamina is such that they find it more difficult to recover than to adjust their scale of living to the income from their disability insurance. The certainty that the insurance income will stop after a very definite period, regardless of their ability to demonstrate to others the seriousness of their ailments, is a potent factor in convincing many such claimants of the desirability of reestablishing their earning power before it is too late. A ten-year policy might seem at first thought to be almost as hard to underwrite successfully as life indemnity, but a ten-year annuity is vastly different from a life annuity in the eyes of a man who is uncertain whether to give up or to attempt a comeback. A claim limited to one hundred months is entirely paid and all liability thereunder is terminated before the average Class (3) select reserve on a life indemnity claim has stopped growing. Chart I, comparing the mean disabled life annuity values under a one hundred months' policy (with 90 day exclusion period) and a life indemnity policy for lives disabled at age 35, gives an indication of the salutary effect which even a long limit can exercise. The average Class (3) select annuity at the end of the first year under a one hundred month policy is equal to only a little more than three years'

indemnity and is already close to its maximum value. The limit—even a long limit—prevents underwriting errors from accumulating in the form of permanent claims with extremely high reserves. Therein lay a major weakness of life indemnity; and, conversely, there lies a major strength of modern limited-term non-can.



The limitation on the indemnity serves also to draw a broad distinction between disability and superannuation. That distinction is hard to draw for a life indemnity claim, and as a result the disability policy was made to bear the cost of many a claim which was really a regular old age annuity. A part of the unfortunate experience under life indemnity coverage was caused by providing protection against both the old-age hazard and the disability hazard, all for the premium and reserve calculated for disability only. Taking advantage of hindsight it can be said that results would have been better if the policies had made outright provision to cover both hazards, or if the stage had been better set to exclude or reduce the old-age hazard. Today's limited long-term policies adopt the second alternative.

Such longer-term policies must still be more carefully underwritten than the short-term coverage. Limitation to a relatively short period is a greater safeguard against the moral hazard than limitation to a longer period. Even cutting the annuity off at eight or ten years is not positive protection against retiring on the policy. A prospective pseudo-invalid may find that such insurance would provide a very nice temporary supplement to his other financial arrangements for retirement. The underwriter of long-term non-can is much more concerned with this problem than the underwriter of short-term coverage. Another factor, too, relieves the underwriter of short-term non-can from some of the pressure on his long-term associate. The expected cost of disability under any policy is a function of the frequency of claims and the cost per claim. Short-term policies, because of their short waiting periods, expect a high frequency and a low average claim. Long-term policies generally carry a waiting period of one to three months and expect a frequency which may be less than one-tenth of that on a short policy, but with an initial value of the claim annuity which may be more than ten times greater. A rate of underwriting error which could pass almost unnoticed when the expected frequency is 250 per thousand could be a very serious matter if the expected frequency is 25 per thousand. The underwriter of the latter risk must exercise tremendous care and apply most stringent standards of insurability. For that reason this paper tends to be more concerned with the long-term coverage and its underwriting safeguards.

Underwriting the Moral Hazard

The qualitative aspect of the need for disability insurance has already been touched upon. The underwriter is more directly concerned with the quantitative aspect—how much insurance is needed and may safely be granted? It is an axiom of disability insurance that the insured must be a co-insurer of the risk. The income from insurance must not approach the income to be earned on the job or there will be incentive to malinger, or at least lack of incentive to recover. Beyond this, the answer lies in the level of income which the applicant has established. Disability insurance should be large enough to afford necessities, but

only under carefully guarded conditions should it ever be a factor in providing the insured with luxuries. Where earned income is the only means of support, a small income will allow few luxuries and a substantial percentage of the income may be insured. Where income is larger, the percent thereof needed for necessities—and consequently the percent insurable—is smaller. Moreover, where the established income is large the line of "necessities" can be drawn at a lower level after a spell of disability. A man who would spurn a $4,000 income while he is active may prefer a $3,000 income rather than attempt a recovery if disability has sapped his morale. Such depreciation of the risk has a vital bearing on the upper limit of the need for disability insurance. Where there is other income, from savings or inheritance for example, which does not depend on current earning ability, that income could be used to provide necessities in event of disability. Withdrawals from principal can be used in like manner. The existence of such alternative means of support obviously reduces the need for disability insurance, and where such alternative means are substantial, the need for insurance does not exist at all.

In translating this reasoning to specific standards the 1921 Committee of the Personal Bureau recommended[3] for life indemnity non-can that the amount of indemnity provided by all insurance should not exceed sixty percent of earned income, and that in any event such indemnity should not exceed $500 per month. For limited long-term policies this has been modified by companies today to permit up to seventy-five percent of established earned income, subject to the maximum of $500 monthly. Emphasis should be laid on the phrase "established earned income". No applicant is acceptable who has not an established and reasonably steady source of earned income, and care should be taken to avoid basing participation on a temporarily high level of income.

A special case is presented by the professional man whose gross income from his practice depends on his active attention thereto, but whose net income is reduced by the cost of maintaining his

[3] "Revised Joint Report of the Committees Known Respectively as the Underwriting and the Actuarial Committees on Non-Cancellable Disability Insurance", submitted to the Bureau of Personal Accident and Health Underwriters, June, 1921. Page 11.

office. He has a legitimate need of insurance to support his office during disability, but if disability should become protracted, he could give up the office and thereby increase his net income from insurance. The case illustrates a situation in which a distinction may well be drawn between the underwriting of long-term and short-term coverage. Short-term participation may properly be based on gross earned income, but it would be a mistake to base long-term participation on anything but established net earnings.

A company can control its own policy of participation and limits, but once a non-can policy is issued there is nothing to prevent another company with less conservative standards from issuing additional insurance which violates those limits. Standard Provision 17 relieves this problem for cancellable policies; if the company is notified of other insurance it may cancel if it wishes, and if it is not notified the insurance may be prorated. A non-can company has no redress if it is notified of other insurance after the risk has attached. The policyholder who obtains other insurance with a questionable motive is most likely to protect himself by giving notice thereof, so it follows that Standard Provision 17 has small significance in a non-can policy.

Of more importance is the so-called "average-earnings clause", which provides, in the event of overinsurance, for the reduction of the policy's indemnity in accordance with the proportion by which insurance exceeds the average earnings of the insured over some previous period, generally two years. Such a provision is not new, but for competitive reasons it is seldom used in short-term policies where the retirement hazard is not great. The recent New York Code incorporated the average earnings clause as an optional standard provision for non-can policies.[4] Only Massachusetts among the more populous states denies its legality (although not its propriety). The provision is the only feasable form of protection against overinsurance resulting from decreased earnings, but observance of uniform and conservative standards of participation by the individual companies is far more effective in preventing deliberate overinsurance.

The underwriter depends heavily on knowledge of other companies' experience with an applicant. If another company has had bad experience, such as repeated claims, serious malingering

[4] § 164 (5).

or unreasonable attitude in adjusting a claim, there is little reason to expect that the applicant would be a good risk on a non-can policy.

The underwriter will also want to know, besides the general economic situation of the insured and his established earned income, any special hazard which may be connected with his occupation; whether his history contains anything revealing an unusual hazard, such as financial stress, tendency to avoid just obligations, unfortunate domestic situation, or personal habits leading to increased individual hazard, to name a few examples. Anything which indicates a tendency to be unreasonable or unbusinesslike in case of a claim indicates an undesirable policyholder. It is customary to obtain an inspection report on every applicant for long-term insurance, and on every short-term applicant for more than a nominal amount of insurance. Particular attention must be paid by the inspector to earned income and to other income, and the underwriter of long-term especially will often find that a close watch is needed to keep the inspecting agency constantly careful of these items. Extreme, almost fanatical attention to this phase of underwriting is a *sine qua non* of successful underwriting of long-term non-can. Henry Jackson was once moved to suggest that disability insurance can easily become "a benefit the enjoyment of which does not necessarily conflict very seriously with the desires of the insured".[5] Any benefit so describable is doomed in advance. The purpose of non-can is to provide a sure income when disability impairs earning power, but the underwriter must bend every resource of training and instinct to avoid accepting a policy which at any time during its entire term could invade that area where the insured, considering everything, finds it no more to his advantage to recover than to prolong his dependence on insurance.

These remarks on the underwriter's treatment of the moral hazard are intended to be provocative rather than exhaustive. The history of non-can has surely shown the necessity of strict observance of stringent standards, applied by executives who know the ground and how to walk upon it. The conduct of each separate department is the task of an expert, and acute awareness of the problems of other departments is essential to adequate

[5] XVII P.C.A.S. 298.

administration of each expert's own department. It is the function of this paper not to attempt the detailed delineation of the entire terrain but to follow each separate road only as far as may be necessary to show its relationship to the others. This discussion is an index map of the fields in the territory; the drawing of a large-scale detailed map of each field is the expert's task.

Underwriting the Physical Hazard

The physical hazard must be underwritten as searchingly as the moral hazard. Both long and short-term policies require strict standards of insurability, and a medical examination has an importance at least as great to the non-can underwriter as to the life insurance underwriter. So far as can be discovered, every risk must start on a reasonably equal basis. It is philanthropy, not insurance, to accept risks which have already started along the road to a serious claim. Long-term insurance especially calls for the services of skilled medical examiners who have an interest in the success of the company. A life insurance examination is not adequate to the needs of the non-can company's Medical Director; for disability and mortality, while related risks, are not identical and the hazards are not always measured by the same yardstick. A competent disability examiner, for example, can occasionally discover and impart to the Home Office some aspect about the applicant which bears more on the moral hazard than the physical, and in which the life company would have not the slightest interest. Frequent examinations for a non-can company develop familiarity with the aspects peculiar to disability underwriting, as well as giving the examiner a financial interest in doing a good job. A small but reasonably busy list of examiners will enable the Medical Director to develop relationships which will add immensely to the value of the examinations.

It must be recognized that even under ideal conditions a medical examination has its limitations in evaluating the physical hazard. Considering the number of clinics devoting their full time and their resources of special training and equipment, with the entire cooperation of their clients, to problems of diagnosis and preventive medicine, it would be foolish to expect perfection from a brief inspection of a subject not always fully cooperative.

The value of the able examiner lies in his appraisal of the personality and appearance of the applicant, and in his assistance in obtaining family history, personal medical experience, and further checks on other insurance, as much as in his report on blood pressure, urinalysis, and other physical aspects. Duplicating questions in the Declarations to the Medical Examiner, which generally form a part of the application for the policy, can be used to check the answers to important questions in the application proper. The atmosphere of a physical examination is often more conducive to careful answers than the circumstances surrounding the taking of the main application. A medical examination may also be valuable for its psychological effect in discouraging outright the application of poor risks.

A large amount of short-term non-can is written non-medically. This practice has two chief justifications, both arising from the fact that the non-medical insurance is issued only where relatively small benefits are involved. A low earned income leaves little margin above necessities, and insurance within proper limits leaves even less margin. There is small incentive to malinger under such circumstances, and experience on small policies is recognized as being better than on larger policies. Furthermore, the standard cost of a full medical examination is a large percentage of the premium for a small policy. The savings from waiving the medical together with the recognized lower disability cost of the small policy provide a margin which can offset the possible increase in frequency resulting from non-medical underwriting. Where doubt exists as to some physical aspect the companies often call for a medical examination even on small applications.

The actual evaluation of the physical risk is the job of the Medical Director and is not a subject for detailed analysis here. In doing that job he has the advantage of experience gained in the not-too-distant past. Tuberculosis has been one of the greatest causes of disability losses in the past. It now seems possible that strict attention to family history, in connection with age and weight of the applicant, may have increased the underwriter's efficiency in avoiding this hazard. Insanity and the field of psychoses and neuroses in general have caused and still cause many disability losses. It is not impossible that in this field also greater attention to family history and to economic and personal

history, together with a more conservative view toward abnormal blood pressures, may reduce the frequency of claims.

Substandard Risks

Selective underwriting automatically implies denial of insurance to some individuals, and the use of such phrases as "strict observance of conservative standards" suggests that such individuals may be numerous. That is particularly true of longer-term coverage. The very underwriting feasibility of such coverage depends on the acceptance so far as possible only of risks free from actual or incipient impairment. What, then, of the numerous prospects who are not acceptable as standard risks? They have greater need of insurance than standard risks, and where need exists both social and business considerations draw attention.

It has already been remarked that short-term insurance puts a relatively smaller penalty on an underwriting error because of the greater frequency and lower average claim cost. Borderline cases of certain types can be viewed somewhat more sympathetically when short-term insurance is applied for. A part of the substandard problem can be handled by offering short-term insurance to certain types of risks not acceptable on the long-term basis applied for. Moreover, where it is possible to exclude a definite and separable hazard, it is common practice among companies to issue a policy from which that hazard is excluded by rider, provided the other aspects of the risk appear sound. Hernia and sacro-iliac strain are frequent subjects of rider. Less frequently accepted are risks from which any abnormality of the gastro-intestinal tract, of the genito-urinary tract, or of the cardio-vascular system, for example, are excluded. Such exclusions are not entirely satisfactory to either party. The insured has limited coverage only, although it is surely better than no coverage at all; and the company's claim adjuster may find the line between accepted and excepted risk exceedingly hard to draw. Nevertheless, where the moral hazard is reasonable and the physical aspect clean in other respects, short-term insurance so restricted may be socially desirable as well as financially possible.

British companies have accepted some types of impairments without exclusion but at an increased premium. If enough cases

are offered to provide an adequate spread—and if the actuary can find an acceptable experience assumption—this practice would create a field analogous to substandard life insurance. For the present, however, and until the experience basis for standard risks is better established, it is probable that American companies will be extremely wary about entering the substandard field. With some exceptions the substandard risk in this country apparently must wait until the companies develop a greater degree of confidence.

Besides the problem of substandard risks there is another type of problem presented by the necessity for strict underwriting standards; namely, the responsibility of applying those standards uniformly. There can be no consideration more important than sound underwriting if a non-can company is to avoid difficulties. The setting up of standards does not always insure their being applied. The human mind, if not carefully watched, is peculiarly open to self-deception. There is little to be gained from kidding oneself—especially since the averages are not so easily kidded. Failure to recognize and to deal realistically with departures from standards can have unfortunate results.

Relation of Agency and Underwriting Departments

Even more subtle is the danger of rationalizing "valid exceptions" to the standard ideal. Such rationalizing is especially possible when the underwriter is subordinate—in practice, if not in position—to the agency organization. When short-term coverage is at risk—that is, when expected disability takes the form of high frequency and low average cost—there is a theoretical argument in favor of "making an exception" of an occasional near-borderline case in order to iron out an agency difficulty. The theoretical argument, however, runs up against the practical difficulty that the making of exceptions, like other habits, can easily become master of the situation. In the long-term field, with its low frequency and high average cost, it is an unusual agency difficulty which is worth inviting a claim that may run into thousands of dollars. The independence of the underwriting department—its complete freedom from all agency pressure—is a condition of success in the long-term field, and will prevent many headaches even if a company engages in the short-term field alone.

The nature and training of the agency organization can have a great effect on the company's success in underwriting both physical and moral hazards. To survive, a company must have a reasonable volume of good business. The agency force determines both the quality and the quantity of business submitted for home office underwriting. Poor risks will be ready applicants under any agency system, but good risks in general must be sold. A well-trained, aggressive sales organization will produce applications from good risks as well as poor; a weaker type of agent will get as many applications from poor risks, but will not sell as many good risks. The same underwriting standards may be applied to both groups of applications, but there is more chance of error in underwriting a group of predominantly poor risks, as well as greater temptation to accept borderline cases. Agents who understand the intangible aspects of non-can underwriting may do some underwriting of their own before risks are submitted to the company, but such underwriting by agents cannot always be relied upon. Training in underwriting is valuable, but training in selling is fully as important if the home office underwriter is to see many applications from desirable risks. If there were two companies alike in all other respects except agency organization, the company with a full-time force of good salesmen would unquestionably have the better experience. A force of good salesmen working only part time for the company would produce better business than a full-time force of weak salesmen. The business from a group of part-time order-takers alone might conceivably lead to the destruction of a company, because of underwriting errors, inadequate volume, or more probably both.

Legal Hazard

The moral and physical hazards do not complete the score—there is still the legal hazard. No discussion of life company disability insurance fails to dwell on the enlargement of the contract by the courts as one cause of the adverse experience. "Total disability", a phrase originally intended to confine the benefits of the policy to bona fide cases of necessary loss of income on account of disability, came to mean any physical or mental inconvenience to the insured in his relationship with his usual source of earned

income. The word "permanent" in a disability clause acquired a meaning quite different from its meaning anywhere else. There is no intent here to discuss this history, or even to suggest that the courts in general overstepped the limits of social advantage. The example will serve simply as a reminder of the importance of the legal hazard, and of the fact that the process of judicial modification of the policy has not stopped.

A phase of the legal hazard arises in efforts to fit the policy to the facts in individual cases. The court and the parties may all agree on the definition of total disability, for example, as used in a particular policy, when the issue lies in the determination of whether the facts in the case fit that definition. In its effort to avoid a denial of recovery to the policyholder the court may stretch the facts, or it may distort the definition. If the former occurs, the one case may be lost without any adverse bearing on other cases; but in the latter event, new law has been made, and the definition of total disability may have been extended for the future.

The most satisfactory defense against the legal hazard is to keep as free as possible from all litigation. The ingrained desire of the courts to avoid finding against the policyholder is well recognized, and if not abused leads to proper principles for court guidance. One such principle is the established rule that an ambiguous provision in the contract is to be construed strictly against the maker. That rule puts the drafter of an insurance policy on his mettle to make the policy conform to real economic and social needs and to use phraseology which is clear and consistent with those needs. Even crystal-clear phraseology will not prevent judicial straining of terms if the policy is not consistent with sound social and economic values. A policy of insurance may best be regarded, not as an ironclad contract, but rather as a general memorandum of the intent of the parties. If that intent is reasonable, if the provisions are fair, if the actuary has set rates which allow the claim administration to be reasonably generous, then a company's chances of successfully defending suits are surely enhanced; but in such circumstances virtue will reward itself and there will be fewer suits to defend. Under these conditions most of the remaining litigation will arise from such causes as misrepresentation in obtaining the policy, gross malingering,

or just pure cussedness. These causes are individual rather than general. They can never be eliminated, but an able application of strict underwriting principles can do much to cut them off at the source by avoiding the acceptance of applicants who give indication of being other than reasonable in the event of claim.

Claim Administration

The preceding paragraph commended generosity in claim administration. Proper public relations and good business practice both demand fair treatment of policyholders, but even such virtues as fairness and generosity can be abused, and in every large group there will be a few who will take any selfish advantage possible. It is on account of these few, rather than the honest many, that insurance companies must be so concerned with "defenses". It is probably unavoidable, though unfortunate, that the public is less aware of the customary amicable relationships than it is of the use of these defenses against the small minority of questionable or unscrupulous claimants. Almost every honest citizen will readily accept from the claim adjuster just a little bit more than he might strictly be entitled to receive. That extra little bit is a part of the price of good policyholder relations and must be included as a part of the premium to be paid for the insurance. The company should be in a position, however, to resist any attempt to swell the extra little bit into more significant proportions; otherwise the honest majority will be forced, by the extra premium made necessary, to subsidize the inequitable claims of the minority. Such subsidy is either charity or graft, depending on the intent and attitude of the claimant. It most certainly is not a proper part of insurance. Hence the attention devoted to the exceptional dishonest or questionable case by the claim administrators as well as by the public is unfortunately out of all proportion to the number of such cases.

Most questionable disability claims fall into one of two categories: either an unquestioned disability involving doubt as to whether the policy covers, or a condition which would be covered except for a possibility that the claimant is not truly disabled. Each category has its typical defenses, both legal and tactical. This division applies to all types of disability insurance, cancell-

able and non-can, long-term and short. The nature of the defense, however, may vary considerably according to the nature of the policy coverage. The full analysis and detailed presentation of these defenses is, as suggested earlier, the task of the expert in the field of claim administration. It is not out of order, however, to touch upon a few of the aspects particularly applicable to non-can.

Claims in the second category—questionable disability—present an extremely serious problem under policies providing life indemnity for sickness disability, because of the retirement hazard. When the policy is limited, the retirement hazard is severely checked, and the more ordinary degrees of malingering become of greater relative importance. Under a short-term cancellable policy, if normal tactics fail to shake a malingerer, the company can afford to let a claim run its course and then cancel to prevent a repetition. Recourse to cancellation is denied under a non-can policy, and if the term is long, the company cannot afford to be satisfied with ordinary efforts to prevent malingering. One device occasionally used is the provision in the policy that benefits will be reduced if the insured, while still totally disabled, is not confined withindoors. This device creates a strong financial deterrent to malingering, but since the effect of real total disability on earned income is independent of the confining nature thereof, some companies hesitate to draw the distinction. Another policy device, more effective with short-term policies than with long, is the aggregate limit upon indemnities. When benefits have been paid for a period the remaining limit is reduced accordingly and the fixed premium is at a higher rate. The effect is negligible on a long-term aggregate, but may be significant where the limit is short. To some extent the proportionately higher cost of the reduced limit reflects a depreciation of the quality of the risk, and the higher rate of premium is an automatic correction. The correction is haphazard, however, and falls alike on the just and the unjust, the standard risk and the malingerer, and for that reason (among others) some companies set the limit, not as an aggregate, but rather as a limit to the period of indemnity for each individual disability.

The most effective weapon against long-term malingering, aside from the friendly and resourceful adjuster, may be a physician

who understands the nature and purpose of disability insurance. Standard Provision 8 gives the company the right and opportunity to examine the person of the insured when and so often as it may reasonably require during the pendency of a claim. If a physician or specialist retained by the company is satisfied that whatever condition may exist does not constitute total disability within the meaning of the policy, regardless of how desirable a long vacation may be to the policyholder, it not infrequently happens that the professional relationship between the specialist and the insured's own physician makes it possible to discuss constructively the real nature of the insurance. An admission by the insured's own physician that disability is not total generally leads to the insured's modifying his claim to indemnity for partial disability. Provision for partial disability is generally omitted from short-term policies as creating so much additional cost as to make the premium disproportionate. In long-term policies, however, a provision for a limited period of partial is a desirable means of effecting an amicable transition from total disability indemnity to recovery. Properly handled, it will often reduce the amount of indemnity otherwise payable while at the same time cementing good feeling between the policyholder and the company.

In the long run the best safeguard against malingering is the personal contact between the company's representative and the insured and his physician. If the physician continues to state that indemnity should be paid, there generally isn't much the company can or should do about it but pay. Even where the good faith of the physician's statement is dubious the courts in general offer no practical relief. It is this consideration which leads companies to rely on the policy limit for prevention of retirement, to underwrite severely to reduce the moral hazard, to rely heavily on the personal touch in claim administration, and to resign themselves to pay for any malingering which creeps through those guards. The same considerations and reliance on the same factors have also led companies to relax the policy definition of total disability, on the ground that there is no use scaring a prospect by an apparently restrictive definition that can't be enforced anyway, and wouldn't be enforced if it could be. The older policies defined total disability as inability to engage in any occupation for wage or profit. This definition led to fears

that ability to sell shoestrings on a street corner would disqualify the insured from benefits. This "shoestring" objection has never been justified, but the definition remained, with "any occupation" interpreted as meaning any occupation reasonably consonant with the insured's training and background. Culminating the trend of earlier court decisions, total disability is now rather generally defined as inability to engage in the insured's regular occupation. It is quite generally so interpreted even when not so defined. Only in the longest-term coverage does any other definition appear. Even there the insured's own occupation is the criterion for all but the most protracted disability. For such disabilities the test is still whether an occupation in which the insured may engage is one which he might be expected to enter, giving due consideration to his background and experience.

Defense of Origin

Into the other category fall the cases where the existence of disability is unquestioned, but where the disability is not covered by the policy. Policy provisions excluding certain types of disability are not common. Unrestricted coverage is socially desirable, and competition reinforces the desire to provide insurance as free from restrictions as may be consistent with sound underwriting. One type of restriction, however, is both necessary and desirable; namely, the restriction of coverage to disability which has its origin after the date of the policy. Earlier reference has been made to the impropriety of asking a company to insure an individual who already has a head-start toward a costly claim. When the policy is issued all risks should be, if not on an equal footing, at least up to a certain standard of insurability. It is a major part of the underwriter's job to weed out those applicants who fail to meet that standard, but the best underwriter is human and his tools are fallible. It is proper, therefore, that he be supported by a policy provision excluding any disability which has its origin prior to the policy date. Only by such an exclusion can a company avoid saddling honest policyholders with the extra cost of unwarranted claims from dishonest or careless policyholders, which for long-term policies especially could be a serious burden. Abuse of the exclusion is prevented by the necessity of

showing clearly the causal relationship of the pre-existing condition to the subsequent disability.

This defense of origin, so-called—that is, defense based on proof that the origin of disability antedated the policy—is alternative as well as supplementary to the defense involving rescission of the policy. Policy rescission is an uncertain procedure at best, and is automatically limited if the policy contains an incontestable clause. The defense of origin gives the company another and stronger string to its bow. The policy is not disturbed under this alternative procedure; on the contrary, a provision of the policy is relied upon in defense of the claim. The New York Court of Appeals found in *Metropolitan Life Insurance Company vs. Conway,* 252 N. Y. 449, 169 N. E. 642 (1930), that a provision in a life insurance policy excluding death from certain causes (and specifically excluding death having its origin in a condition existing prior to the date of the policy) was not in conflict with the incontestable clause. In *Apter vs. Home Life Insurance Company,* 194 N. E. 846 (1935), the same court applied the principle and specifically allowed the defense where the company was being sued for disability benefits. The policy provided a benefit, in effect, for "disease originating after the date on which this agreement becomes effective". The court said, "The parties have stipulated that fraud by the assured will not vitiate the policies after lapse of one year. That stipulation is not open to the construction that fraud of the assured will result in the imposition upon the insurance company of a liability extending beyond the terms of its policy."

The recent New York Insurance Code, §155 (2), denies the right to use the origin clause in life insurance policies, but there is strong and compelling support for the origin defense as a part of non-can policies. A disability can be kept under cover until the policy becomes incontestable. Only the origin clause can prevent a miscarriage of justice under such circumstances. For every case where a pre-existing condition results in death there are many cases where the result would be disability of varying degrees of severity. This greater frequency puts a correspondingly greater and more subtle burden on the underwriting staff, and particularly on the medical examiner. Courts have referred sometimes to the fact that companies have had the opportunity

through their medical examiners to make a thorough inspection of the applicant's physical condition. This opportunity is greatly overvalued. The practice of preparing impaired risks to pass physical examinations is notorious. The examiner who is trying, usually without cooperation and on occasion with downright opposition, to discover possible impairments where he has no special reason to suspect that impairment exists has no chance of anything like a perfect score. His examination must be cursory at best, because of unavoidable lack of time and equipment to make a thorough clinical diagnosis. Since the examiner is so inevitably unable to discover all the existing conditions which may lead to subsequent disability, it is proper for the company to have the policy exclusion as a secondary defense.

Furthermore, there can be only one claim under a life insurance policy—the death claim. That one claim is the sole purpose of the life policy, and when it is made the policy automatically matures to the benefit of persons other than the insured. The exercise of the defense of origin under a life policy has exactly the same effect on the beneficiary as rescission of the policy. Benefits under a disability policy, however, are payable to the insured himself, and are not by any means limited to a single claim. The disability for which indemnity is denied by the origin clause may be followed by others for which indemnity would properly be payable. The fundamental purpose of the policy is, therefore, not denied to the disadvantage of third parties. A non-can policy may be an instrument of gain to the insured himself. The moral hazard in general is so great in the non-can field that the company needs this additional means of excluding from its exposure those cases where the insured event is already in process of happening.

Incontestable Clause

The weakness of the right to contest a policy has already been suggested. The chances of a successful action to rescind after two or three years are very small indeed on a policy issued after a medical examination, however inadequate in fact the examination may be. The chance of successful rescission is somewhat greater if the policy was underwritten non-medically. Since many short-term policies are issued without medical examination the

New York Code does not require an incontestable clause to be included in policies imposing an indemnity limit of not more than two years. Longer-term non-can policies, quite generally underwritten with medical examination, are required in New York to contain an incontestable clause, and after the initial contestable period, reliance is placed on the origin clause alone to exclude liability for disabilities involving a pre-existing condition.

An incontestable clause in a disability policy, paradoxically, may sometimes enhance the company's chance of a successful rescission action during the initial contestable period. The impending incontestability of the policy has the effect of threatening to deny to the company the right to defend a possible suit on the grounds that the policy was obtained by material misrepresentation. In most jurisdictions the possible lack of an adequate remedy at law opens the door of equity to the company, which can ask to have the merits of the case decided when memories are fresher and when prejudices are less apt to be aroused than in a later defense to a suit by the policyholder. In equity, before a judge alone, the company may sometimes receive fairer treatment than before a jury at law. With the defense of origin available, some non-can executives welcome an incontestable clause, not only because of the value of assuring the policyholder that he cannot later be deprived of his policy on account of an inadvertent misstatement in his application, but also because it actually improves in some cases the prospects of defeating improper attempts to obtain insurance by misrepresentation.

The foregoing discussion is based upon the law in New York State under the Conway case. This interpretation cannot be relied upon universally. In some jurisdictions the rescission act is accomplished differently, and is available for any type of policy which has not become incontestable by its terms. In some other jurisdictions the courts have decided, in effect, that the incontestability of a life insurance policy prevents the company from defending a claim for any reason not specifically saved in the incontestable clause itself. Applied to an incontestable disability policy, this interpretation would mean that a company could not rely upon any exception in the policy (including the origin clause) unless the exception were incorporated into the incontestable clause. The result of such an extreme interpretation might be

either a very awkwardly drafted policy or else a blank check to the policyholder. It does not appear that this question has ever been presented in such jurisdictions on a disability policy, and the decision might be different. Because of the danger, however, non-can policies are not made completely incontestable. The phrase "incontestable as to any statements made in the application" provides incontestability as broadly effective as the general clause under the interpretation of the Conway case, and by the limiting words it is hoped that the extreme position referred to above may be avoided in states which do not follow the New York rule.

Activity in Claim Supervision

Fortunately, in spite of the attention devoted to rescission, defense of origin, and other methods of resisting claims, there are relatively few cases where such methods need be applied. Most claims involve no disagreement between company and policyholder, and are settled in normal routine to the satisfaction of both parties. With few exceptions the claim adjuster's task involves friendly routine calls which serve the two functions of creating service contacts with the disabled policyholder and of reducing possible malingering. The former function is obvious; the effect of the latter can be emphasized by a reference to the Conference Modification of Class (3) Experience. Two-thirds of those disabled more than six days recover before they have been disabled one month; three-quarters of those disabled one month or more recover by the end of the third month; and of those whose disability lasts over three months about four-fifths have recovered by the end of the first year—all according to Conference Table age 45. If each of these temporarily disabled policyholders were to malinger for a single week beyond a reasonable recovery date, the resulting increased claim cost would be a significant addition to the cost assumed. If a substantial minority were to extend their claims for a few weeks, the company's loss ratio would suffer sadly—hence the importance of reasonably frequent check-up visits to reduce malingering during the early period of disability. Almost every honest citizen's conscience will allow him to extend his recuperation a trifle when the company is helping to finance it. This much must be assumed as an integral part of the cost of

insurance, and it is to a company's advantage for the disabled policyholder not to invite a setback by too early activity. It is not fair to the honest policyholder, however, to assume that very many recuperations are to be exaggerated very much. Careful application by the underwriter of the principle of coinsurance will serve as a general check on such malingering, but the specific check of the claim adjuster is needed to prevent the wholesale petty malingering which can so drastically alter the average cost when a rapid recovery rate is expected. Careful watch in the early stages of a claim, moreover, may forestall later developments which would make the claim more costly than it ought to be.

After the early disability months the picture changes tremendously. Still referring to Conference Table age 45, 72% of those still disabled at 12 months remain so at 2 years; only 20% recover in the third disability year, only 13% in the fourth year, and in the tenth year less than 5%. Even if every recovery after the second year were postponed a month or more, the effect on the average cost would be relatively minor compared to the effect of a few days added to each of the more numerous shorter claims. The longer claims need service, and the realization that the company is watching will help to reduce major malingering. Intensive activity among longer claims, however, for the purpose of reducing petty malingering could easily cost more than the saving in benefits.

Advance Settlements

Two related problems occasionally confront the administrator of long-term claims—rehabilitation, and the buying up of a claim or policy. Cooperation with the claimant to encourage him to attempt a comeback may be very effective if he is assured that his effort to work will not impair his insurance income for a reasonable test period. Sometimes a claimant who is physically able but mentally whipped could be restored to activity if he had the capital to reenter an economic field in which he is experienced—storekeeping, for example. A reasonable advance on the policy can sometimes serve the double function of restoring the man's self-confidence and of saving an expensive protracted claim by reestablishing the policyholder's earning power.

Nearly related to this type of advance is the buying up of a

policy in order to substitute a known loss for an indefinite claim liability. The large reserves required on long-term claims increase the temptation to make such a substitution, particularly if the claimant is willing to settle for a sum which is smaller than the reserve. There is a subtle danger in the practice, namely, that the reserve held on a claim in conformity with a recognized valuation standard will be confused with the individual value of that claim. A tabular reserve is an estimated average value, too high in some cases and much too low in others. Which case is high and which case is low cannot be told individually, but over the whole the salvage from the overvalued cases must be available to make good the deficiency on the others. The claimant who will settle most readily is generally the one who has the best expectation of speedy recovery. The adjuster who settles very far in advance with many such claimants may find it necessary to draw on the company's surplus before the remaining claims are fully paid. For that reason any policy of settling claims by large advance payments should receive the gravest study and analysis.

Disability Experience

In one sense, everything written above has been introductory to the ever-present problem of rates and reserves. Whatever the merit of the pages above, they should at least have pointed once again the costly lesson that the moral hazard, and to a lesser extent the legal hazard, are responsible for a very real part of the cost of non-cancellable disability insurance. Two companies could write exactly similar policies at the same premium rates; but if one management were conservative and the other not, the experiences would be vastly different.

The premium structure of non-can insurance cannot be considered apart from the underwriting foundation. The Non-Cancellable Reserves Committee of the Health and Accident Underwriter's Conference gave recognition to this when it gave specific warning in its 1939 report[6] that net premiums derived from its tables were not to be considered a proper basis for the computa-

[6] "Report of Non-Cancellable Reserves Committee," published by the Health and Accident Underwriters' Conference, May, 1939. This report was restricted to active life reserves. A subsequent report in May, 1940, considered reserves on disabled lives.

tion of gross premiums. There can be no single standard experience upon which to base premiums for each and every sort of policy. Disability is a subjective hazard—if a man claims to have a pain it is effectually impossible to prove him wrong. It is conceivable that the incidence of actual physical disability might conform to a reasonably uniform table, but actual physical disability is not the event insured. The companies must pay benefits for disability which is effectively claimed. There is an extra cost to this risk equal to the sum of dishonest claims plus claims, often honestly made, where an actual condition is made to assume proportions it properly should not have. This extra element measures the moral and legal hazards, and the actuary must have some yardstick before he can estimate premiums. He must know the standards and the personalities which will govern the acceptance of risks and the administration of claims; and in following his company's experience he must be familiar with the current practices and the extent to which the company actually adheres to its professed standards. These factors are subject to wide variations. The company which is most conservative in all respects will enjoy the least costly claim experience. A company not reasonably conservative in most respects may be wholly unable to stay in the field.

Reserves for active lives may not vary as greatly as premiums. Since these reserves depend, not on the absolute level of the term premiums, but rather on the relation of the annual term premiums one with another, it follows that a very high level premium may actually develop reserves no higher—or even lower—than a smaller level premium. This is true of short-term coverage with a short waiting period compared with long-term coverage with a long waiting period. The level premium for the former might be considerably higher, but because the term premium curve slopes less, the reserves are lower. It might also be the case where two companies issued similar non-can policies, but one—Company A—paid less underwriting attention than Company B to the tuberculosis risk, for example. Company A would probably have higher claim costs at younger ages, but as the body of policyholders grew older, the claim costs of the two companies would grow more nearly alike. Company A's experience would develop the higher level premiums of the two, but the same experience, with costs

higher in early years than Company B, would develop lower policy reserves. Similarly a restrictive provision in a policy, lowering the premium, might actually require higher reserves if the restriction had greater effect at the younger ages. If the reduction were the same at all ages, not percentage-wise but absolutely, the reserves would be the same as for the unrestricted policy.

If the assumption could be made that differences in underwriting and in policy restrictions, assuming similar periods of coverage, effected a constant modification of the term premiums, then it would be possible to develop a table which could be used to value active life reserves, even though the net premiums derived therefrom would not reflect actual losses. Experience is not available to prove or disprove the validity of such an assumption, but empirical reasoning can go far to justify it. Physical underwriting soon wears off, and its effect on reserves need not be considered if ultimate premiums are assumed. Arguments can be set up for both higher and lower reserves as the result of common policy restrictions, and since experience is lacking, it seems reasonable to make the assumption, when seeking a minimum reserve standard, that opposite effects on reserves cancel each other. Similarly for the effect of the moral hazard; if underwriting is unsuccessful it is doubtful if any level of premiums or reserves would suffice to prevent disaster, but the disaster would probably result from insufficient premiums rather than from insufficient reserves. With reasonable underwriting, it could be argued that cases of questionable origin in early years and of questionable merit in later years would effect a roughly constant addition to the cost of purely physical disability. The Conference Committee, seeking a basis for recommending a minimum reserve standard, made these assumptions, and for that purpose the assumptions are justified.

A minimum reserve basis should be studied carefully before accepting it as the basis upon which a company's continued solvency will depend. A conservative company would naturally adopt a standard which would reserve the unearned premiums until they are needed. With conservative underwriting the Conference recommendations may actually prove redundant for some policies. The Conference basis is not a feeble reserve standard, and even where it may prove inadequate the minimum reserves should be enough to enable the diligent company to work out of

the situation, provided proper steps are taken as soon as the inadequacy is known. Inadequacy of premium can be a much more serious matter than a small inadequacy of reserves, and if premiums are adequate it may be possible by economies to wipe out a reserve deficiency.

Net Premiums

The mechanics of calculating net premiums and reserves for non-can policies has been presented in detail in the publications of the Actuarial Society of America[7], and Mr. Craig has presented a paper on the subject to our own Society[8] in addition to Mr. Cammack's important paper[9]. Various premium formulae have been developed from the fundamental principle of determining an annuity-due whose value shall equal the present value (as of the issue date) of expected liability under the policy. Four such formulae are reproduced below. Number (1)[10] is the true formula for an annual premium to provide an unlimited benefit of $1.00 yearly (payable monthly) for disability incurred prior to age y, assuming a mortality table which separates active and disabled lives and defining r_x as the probability that an active life now age x will become disabled prior to attaining age $x+1$:

$$(1) \qquad \frac{\sum_{z=x}^{z=y-1} v^{\frac{1}{2}} \cdot D_z^{aa} \cdot r_z \cdot a_{[z+\frac{1}{2}]}^{(12)}}{N_x^{aa} - N_y^{aa}}$$

Number (2) is the same formula assuming mixed life table and functions:

$$(2) \qquad \frac{\sum_{z=x}^{z=y-1} v^{\frac{1}{2}} \cdot D_z \cdot r_z \cdot a_{[z+\frac{1}{2}]}^{(12)}}{N_x - N_y}$$

Number (3)[11] uses the traditional symbols adapted by Mr. Craig in his paper, modified to give the same benefit:

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[7] Especially Actuarial Studies No. 5 (Second Edition).

[8] XVII P.C.A.S. 51.

[9] VII P.C.A.S. 267.

[10] See Actuarial Studies No. 5, p. 165, and XXX T.A.S.A. 410 for discussion of Numbers (1) and (2).

[11] XVII P.C.A.S. 58 ff. The formula assumes a three month waiting period.

$$(3) \qquad \frac{K_x^{3/12\,/\,all} - K_y^{3/12\,/\,all}}{N_x - N_y}$$

where $K_x^{3/12\,/\,all} = \sum_{z=x}^{z=\omega} H_z^{3/12\,/\,all}$

$$H_z^{3/12\,/\,all} = H_z^{3/12\,/\,9/12} + H_z^{1/1} + H_z^{2/1} + \cdots\cdots \text{to end of table}$$

$$H_z^{n/1} = v^{z+n+\frac{1}{2}} \cdot l_{z+n+\frac{1}{2}} \cdot s_z^{n/1}$$

and $s_z^{n/1}$ = sickness incurred at age z suffered during the one year period immediately following the first n years of sickness, expressed as the amount of such sickness for each life-year exposed during the year from age $z+n$ to $z+n+1$.

In applying Formula (3) to such American tables as Cammack's, Class (3) or the Conference Modification[12], special note must be taken of the form of $H_z^{n/1}$. In the form of these tables which gives the amount of disability for various periods by age of disablement, the symbol $s_{(z)}^{n/1}$ means the amount of sickness incurred at age z and suffered during the one year period immediately following the first n years of sickness, expressed as the amount of such sickness for each life-year exposed during the year from age z to $z+1$. For the American tables, therefore, $H_z^{n/1}$ becomes

$$v^{z+n+\frac{1}{2}} \cdot l_{z+\frac{1}{2}} \cdot s_{(z)}^{n/1}$$

and

$$\text{(A)} \quad H_z^{3/12\,/\,all} = v^{z+\frac{1}{2}} \cdot l_{z+\frac{1}{2}} \cdot s_{(z)}^{3/12\,/\,9/12} + v^{z+\frac{3}{2}} \cdot l_{z+\frac{1}{2}} \cdot s_{(z)}^{1/1} + v^{z+\frac{5}{2}} \cdot l_{z+\frac{1}{2}} \cdot s_{(z)}^{2/1} + \cdots\cdots \text{etc.}$$

$$= v^z \cdot l_{z+\frac{1}{2}} \left[v^{\frac{1}{2}} \cdot s_{(z)}^{3/12\,/\,9/12} + v^{\frac{3}{2}} \cdot s_{(z)}^{1/1} + \cdots\cdots \text{etc.} \right]$$

$$= v^z \cdot l_z \cdot \frac{l_{z+\frac{1}{2}}}{l_z} \cdot [\cdots\cdots\cdots]$$

$$= D_z \cdot {}_{\frac{1}{2}}p_x \cdot [\cdots\cdots\cdots]$$

Formula (4) is fundamentally the same as that used by the Conference Committee, based on Formula (3)

[12] 1939 Report, *supra*.

(4) $$\frac{K_x - K_y}{N_x - N_y}$$

where $$K_x = \sum_{z=x}^{z=\omega} H_z$$

$$H_z = S_z \cdot D_z = S_z \cdot l_z \cdot v^z$$

and $S_z =$ the net one year term premium for the benefit. Note the distinction between $s_{(z)}$, which is an amount of sickness, and S_z which is a net one year term premium. Formula (4), for the sake of simplicity, omits from the upper right hand corner of the commutation symbols the designations which indicate the waiting period and the limit of indemnity. The designations will be the same throughout any one calculation and can be understood from the table heading.

The formulae are fundamentally similar. Numbers (1) and (2) are the same formula, adapted for use with active and mixed life tables respectively. Form (2) is used here to compare with the others. Each formula shows the net level premium for a life indemnity policy with a three month waiting period. This benefit is used here for simplicity—the modification to provide for other indemnity periods is made in the term premiums when necessary.

The differences among the last three formulae lie in certain of the commutation devices used and in the net one year term premium. The present value at the beginning of the year of the term premium as used in Formula (2) is

(5) $$v^{1/2} \cdot r_z \cdot a^{(12)}_{[z+1/4]}$$

Using in Formula (3) the second form of $H_z^{3/12/all}$ shown at (A) p. 47 the term premium's present value at the beginning of the year is

(6) $$_{1/4}p_z \cdot [v^{1/2} \cdot s_{(z)}^{3/12\,/\,9/12} + v^{3/2} \cdot s_{(z)}^{1/1} + \cdots\cdots \text{etc.}]$$

In Formula (4) the term premium appears directly as S_x. Using S_z to replace the other forms of the term premium, each formula reduces to the same expression:

$$\frac{\sum_{z=x}^{z=y-1} D_z \cdot S_z}{N_x - N_y}$$

In the development of the commutation columns used to evaluate this expression

$$K_x^{3/12\,/\,all} - K_y^{3/12\,/\,all}$$

is the equivalent of ${}^{\omega}_{y}M^{r}_{x}$ and $H_x^{3/12\,/\,all}$ is the equivalent of ${}^{\omega}C^{r}_{x}$.[13]

Form (5) and its basic Formula (2) were designed for use with the disability income clause of life insurance policies. The benefit was unlimited during disability—i.e., life indemnity—and in the calculation $a^{(12)}_{[z+\frac{1}{2}]}$ was developed by an approximation from the value of $a^{(12)}_{(z)}$. The benefit commenced immediately upon recognition of its total and presumably permanent nature, and the disabled life tables were drawn up on that basis. A change in the presumptive period involved an adjustment to the annuity values. The formula as stated is not convenient for use with varying exclusion periods. For such use the annuity may be restated as

$$k|_m a^{(12)}_{[z+\frac{1}{2}]}$$

where k is the exclusion period after the inception of disablement, and m is the indemnity limit. The term premium assumes the general form

$$(5A) \qquad v^{\frac{1}{2}} \cdot r_z \cdot {}_k|_m a^{(12)}_{[z+\frac{1}{2}]}$$

With the same limit the term premium in (6) assumes the general form

$$(6A) \quad {}_{\frac{1}{2}}p_z \cdot [v^{\frac{1}{2}} \cdot s^{k/1-k}_{(z)} + v^{\frac{3}{2}} \cdot s^{1/1}_{(z)} + \cdots + v^{n-\frac{1}{2}} \cdot s^{n-1/1}_{(z)} + \cdots \cdots + v^{\frac{k+m+c}{2}} \cdot s^{c/(k+m-c)}_{(z)}]$$

where k and m have the same meaning as above, and c is the greatest whole number of years in $k + m$. Form (6A) requires a table which gives the amount of sickness during stated periods rather than one giving the number of lives disabled at stated intervals. The latter type table is used in developing the disabled life annuity factor in form (5A). The two expressions are very similar, but are not identical. The annuity makes no provision for the present value of indemnity accruing after the last full monthly payment and before termination. The amount of such indemnity may be assumed to equal one-half of one monthly pay-

[13] See Actuarial Studies No. 5, p. 158.

ment for each termination prior to the expiration of the indemnity limit, and the present value would necessarily be less than half of one month's indemnity.

In actual calculations the author has used still a third term premium

$$(7) \qquad S_x^{3/12\,/\,all} = s_{(x)}^{3/12\,/\,9/12} + v \cdot s_{(x)}^{1/1} + v^2 \cdot s_{(x)}^{2/1} + \cdots \text{etc.}$$

or in general terms for the limited indemnity

$$(7A) \qquad S_{(x)}^{k/m} = s_{(x)}^{k/1-k} + v \cdot s_{(x)}^{1/1} + \cdots + v^{n-1} \cdot s_{(x)}^{n-1/1} + \cdots$$
$$\cdots + v^{\frac{k+m+c-1}{2}} \cdot s_{(x)}^{c/(k+m-c)}$$

where k, m, and c have the same meaning as above. The discount factor in the last term can be made equal to v^{c-1} without introducing any discernible error. Formula (7A) is easily recognized as Formula (6A) divided by ${}_{\frac{1}{2}}p_x \cdot v^{\frac{1}{2}}$, which varies from 0.983 at age 20 to 0.972 at age 60, using American Men mortality and 3% interest. That is, the Formula (7A) is 1.7% higher at age 20 and 2.9% higher at age 60. It is, therefore, slightly more conservative for both premiums and reserves, although slightly less accurate, and the greater ease of application makes its use preferable in the author's opinion. At the present stage of development of disability experience there is nothing lost by using approximate methods if they are conservative.[14] Even assuming a greater refinement of experience we would be justified in using a more convenient though slightly less exact formula, provided the relationship to the more exact formula is understood. It is important to know the degree and direction of any error of approximation in order to avoid reliance upon margins which may not actually be present. Table I compares net one year term premiums developed by Formulae (5A), (6A) and (7A), and adds for good measure the undiscounted amount of disability.

[14] Note that the measurement of the disability term in the Class (3) table commences with the date of disability, which is the date disability was approved and which is (with some exceptions) 90 days after the date of disablement—the date on which the insured actually became disabled. Formulae used for non-can assume date of disablement, and thus the Class (3) tables are arbitrarily shifted one-quarter of a year away from age 0. The error thus introduced is more technical than real, because of the large element of judgment used in graduating the Class (3) experience. The error and the judgment element are mentioned here as examples of conditions which make too great refinement a travesty on accuracy.

TABLE I

Net One Year Term Premiums — $1.00 Monthly, Payable for 100 Months

3 Months' Waiting Period; Conference Modification of Class (3)— 3% Interest

Age	Formula (5A)	Formula (5A) Adjusted*	Formula (6A)	Formula (7A)	Undiscounted Amount of Disability
20	0.0749	0.0789	0.0780	0.0793	0.0838
30	.0933	.0978	.0980	.0997	.1067
40	.1278	.1336	.1330	.1354	.1456
50	.2327	.2415	.2385	.2435	.2634
60	.4621	.4769	.4704	.4839	.5245

* Adjusted by adding ½ month's disability (undiscounted) for each disabled life recovering prior to expiry of the indemnity limit.

$$\text{Correction} = \frac{1}{2 \cdot l_x} \cdot [l''_{(x)+3/12} - l''_{(x)+1/12}]$$

The net level premium Formula (4) has the advantage over the other formulae of involving fewer and simpler symbols and commutation columns. The Formula is repeated for convenience:

$$(4) \qquad \frac{K_x - K_y}{N_x - N_y}.$$

If ${}_yK_x = K_x - K_y$ and ${}_yN_x = N_x - N_y$

the formula becomes simply

$$(4A) \qquad \frac{{}_yK_x}{{}_yN_x}$$

where

$${}_yK_x = \sum_{z=x}^{z=y-1} H_z.$$

The values of H_x are readily determined by multiplying each D_x by the corresponding S_x. The ${}_yK_x$ column is created directly by accumulating the values of H_x from the bottom upward. Division by the respective values of ${}_yN_x$ then gives the level premiums $[PS]_x$.

Care must be exercised in assigning the value of y. If the insurance terminates at exact age 60, for example, then $y = 60$, and 59 is the last age included in ${}_{60}K_x$ and ${}_{60}N_x$. If the policy phraseology is such that the company is exposed to the risk during

a part or all of the year beginning with age 60, then y is equal to $60\frac{1}{2}$ or 61, not to 60.

Waiver of Premium

If the policy provides for the waiving of its premium an additional question is presented. Formula (1) assumes that only active lives will be exposed to risk, and that only active lives will pay premiums. Waiver is automatically provided by those assumptions. By using a mixed life table the other three formulae assume that disabled lives are also exposed (an error which increases the premium) but that disabled lives pay premiums. Mr. Phillips showed[15] that for the life disability income clause—90 day presumptive—the errors practically offset each other, and that the mixed life Formula (2) is very slightly more conservative for a benefit which includes the waiver. This result will obtain, however, only when the term premium is derived from a table based on an exposure to active lives alone. If the experience table is based on an exposure to mixed lives, the first overstatement is eliminated from the mixed life formula and either a premium must be collected from disabled lives or else the error must be corrected. A simple correction is made by assuming that the level premium for the waiver will be proportionate to the level premium for a benefit subject to the same indemnity limit after the waiting period required for the waiver.[16] The level premium of such a benefit need not be separately calculated but may be approximated from the premium for the income benefit. The error involved in such an approximation, if carefully made, will be insignificant in the final total premium. Using the net level premium $[PS]_x$ for an income benefit of \$1.00 yearly the net level premium for waiving will be

$$[PS]_x \cdot [PS]'_x \tag{8}$$

where $[PS]'_x$ is the adjusted premium for the waiver. The premium given by (8) must itself be waived, at a cost of

$$[PS]_x \cdot [PS]'_x \cdot [PS]'_x, \text{ and so on.}$$

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[15] XXX T.A.S.A. 410.

[16] The refinements of this assumption as they pertain to life insurance disability clauses are discussed at Actuarial Studies No. 5, p. 159, and at XXX T.A.S.A. 406-8.

The total cost of the premium waiver is thus the sum of an infinite geometric series

$$ar + ar^2 + ar^3 + \cdots\cdots$$

where $a = [PS]_x$ and $r = [PS]'_x$.

The total premium for income and waiver benefits is

$$a + ar + ar^2 + ar^3 + \cdots\cdots.$$

The sum is equal to

$$(9) \qquad \frac{a}{1-r} = \frac{[PS]_x}{1-[PS]'_x}.$$

This formula can be easily modified to fit benefits expressed in terms other than $1.00 yearly.

Active Life Reserves

Like the net annual premium calculations, the methods of non-can active life reserve valuation are closely analogous to life insurance methods. Prospectively the reserve at the end of the n^{th} policy year is equal to the present value of future benefits minus the present value of future premiums, or

$$(10) \qquad {}_nV_x = \frac{{}_yK_{x+n}}{D_{x+n}} - \frac{{}_yN_{x+n}}{D_{x+n}} \cdot \frac{{}_yK_x}{{}_yN_k},$$

This formula may be applied directly, or it may be modified to

$$(11) \qquad {}_nV_x = \frac{{}_yN_{x+n}}{D_{x+n}} \cdot \left[\frac{{}_yK_{x+n}}{{}_yN_{n+n}} - \frac{{}_yK_x}{{}_yN_x}\right]$$

which may be expressed as

$$(12) \qquad {}_nV_x = a_{x+n}\{[PS]_{x+n} - [PS]_x\}.$$

Formula (10) is the form which Mr. Craig uses[17], and is followed by the Conference Committee in its report of May, 1939[18]. Formula (11) has the advantage of eliminating one operation in practice—it substitutes the finding of $\{[PS]_{x+n} - [PS]_x\}$ for the calculation of

$$\frac{{}_yK_{x+n}}{D_{x+n}}$$

and the subtraction of $a_{x+n} \cdot [PS]_x$ from the values thereof.

[17] XVII P.C.A.S. 68.
[18] Pp. 18, 20.

In actual practice an accumulation method has advantages in being both simple and substantially self-checking. The premium $[PS]_x$ is collected from l_x lives at the inception of the risk. The present value at the beginning of the year of the first year's cost of insuring l_x lives is $l_x \cdot S_x$. The difference $l_x \cdot [PS]_x - l_x \cdot S_x$ accumulated for one year $(1+i)$ gives the total amount held at the end of the first year on all policies. The average terminal reserve per policy is therefore

$$(13A) \qquad {}_1V_x = \{[PS]_x - S_x\} \cdot \frac{l_x}{l_{x+1}} \cdot (1+i).$$

At the beginning of the second year the new premiums $l_{x+1} \cdot [PS]_x$ are added to $l_{x+1} \cdot {}_1V_x$, the present value of the year's claims are deducted $(l_{x+1} \cdot S_{x+1})$ and the balance accumulated at interest, so that the average value per policy is then

$$(13B) \qquad {}_2V_x = \{{}_1V_x + [PS]_x - S_{x+1}\} \cdot \frac{l_{x+1}}{l_{x+2}} \cdot (1+i).$$

In general

$$(13C) \qquad {}_{n+1}V_x = \{{}_nV_x + [PS]_x - S_{x+n}\} \cdot \frac{l_{x+n}}{l_{x+n+1}} \cdot (1+i)$$

or setting

$$u_x = \frac{l_x}{l_{x+1}} \cdot (1+i) = \frac{D_x}{D_{x+1}}$$

$$(13) \qquad {}_{n+1}V_x = \{{}_nV_x + [PS]_x - S_{x+n}\} \cdot u_{x+n}.$$

This formula is simple to work, each value leading directly into the next, and it is virtually self-checking: ${}_{y-x}V_x$ can equal 0 only if there is no error or if there are precisely compensating errors.

Theoretically the total unearned premium on non-can policies would be the mean reserve based upon the formula

$$(14) \qquad \tfrac{1}{2}\{{}_{n-1}V_x + [PS]_x + {}_nV_x\}.$$

If the premium is payable other than annually the formula could be modified accordingly. In practice this formula is not used by non-can companies, which make their annual reports on the Casualty and Miscellaneous Edition of the Convention Blank. In 1922, in order to meet the accounting convenience of the casualty companies who were currently active in the non-can field, the unearned premium was divided between line 25 (pro-rata unearned premium, as held on the usual type of casualty policy for which the premium is paid for the entire policy term) and line 25½ (the additional unearned premium on account of the non-can feature). The most usual practice is to enter in line 25 the pro-rata unearned portion of the current premium, calculating separately the amount of the accumulated unearned portions of past premium payments to be entered in line 25½. On the assumption that the policies were issued evenly throughout each year the line 25½ unearned premium is the mid-terminal reserve, computed by the application of valuation factors derived from the formula

$$\text{(14A)} \qquad \tfrac{1}{2}\{{}_{n-1}V_x + {}_nV_x\}.$$

This formula does not need to be corrected if premiums are paid other than annually, since the accounting for the current premium is done on line 25.

The level premiums, and consequently the reserves, will vary somewhat according to assumptions of interest and mortality. Tests were made to see what the differences would be, assuming identical term premiums, on a policy to provide 100 months of indemnity after a 3 months' waiting period. Table II shows that the effect of a lower interest assumption is relatively small. Table III shows that premiums and reserves based on American Experience are only slightly different from those based on American Men (Ultimate) mortality, and reserves are actually higher in some cases. The explanation lies primarily in the fact that the mortality and interest enter both numerator and denominator of the level premium formula, thus tending to offset each other. The Tables also indicate roughly the extent of the modification of Class (3) by the Conference Table, for Table II is based on the Conference Table and Table III is based on Class (3).

TABLE II

Comparison of Net Level Premiums and of Terminal Reserves for Different Interest Assumptions, Using Same Mortality

$1.00 Monthly for 100 Months after a 3 Month Waiting Period—Term Policy to Age 60 (inclusive)

Col. 1	Col. 2	Col. 3	Col. 4
		Net Level Premiums	
Age	Net One-Year Term Premiums	A.M.(5)—2½%	A.M.(5)—3½%
20	0.084	0.162	0.153
25	.098	.179	.171
30	.107	.200	.192
35	.119	.228	.221
40	.146	.264	.258
45	.191	.309	.305
50	.263	.365	.363
55	.364	.434	.433
60	.524	.524	.524

Col. 5	Col. 6	Col. 7	Col. 8	Col. 9
	Terminal Reserves			
	Age 35		Age 45	
Policy Year	A.M.(5)—2½%	A.M.(5)—3½%	A.M.(5)—2½%	A.M.(5)—3½%
1	0.112	0.105	0.122	0.119
2	.222	.210	.235	.229
3	.331	.315	.338	.331
4	.438	.418	.430	.423
5	.543	.519	.510	.503
10	1.004	.977	.673	.675
15	1.248	1.236	.215	.219
20	1.111	1.119		
25	.297	.304		

Col. 2—Undiscounted amount of disability from Conference Modification of Class (3)

Cols. 3, 4, 6-9—Calculated from Col. 2 with A.M.(5) Mortality, same formulae, *differing only in interest assumption.*

TABLE III

Comparison of Net Level Premiums and Terminal Reserves for Different Mortality Assumptions, Using Same Interest

$1.00 Monthly for 100 Months after a 3 Month Waiting Period—Term Policy to Age 60 (inclusive)

Col. 1	Col. 2	Col. 3	Col. 4
		Net Level Premiums	
Age	Net One-Year Term Premiums	Am. Ex.—2½%	A.M.(5)—2½%
20	0.081	0.148	0.151
25	.094	.164	.167
30	.100	.183	.186
35	.111	.209	.211
40	.133	.243	.244
45	.175	.286	.287
50	.242	.340	.341
55	.339	.408	.408
60	.494	.494	.494

Col. 5	Col. 6	Col. 7	Col. 8	Col. 9
	Terminal Reserves			
	Age 35		Age 45	
Policy Year	Am. Ex.—2½%	A.M.(5)—2½%	Am. Ex.—2½%	A.M.(5)—2½%
1	0.102	0.103	0.115	0.115
2	.203	.206	.222	.223
3	.303	.307	.320	.320
4	.403	.407	.408	.408
5	.500	.505	.485	.485
10	.941	.941	.651	.648
15	1.183	1.177	.207	.206
20	1.067	1.059		
25	.285	.283		

Col. 2—Undiscounted amount of disability from Class (3)

Cols. 3, 4, 6-9—Calculated from Col. 2 with 2½% interest, same formulae, differing only in mortality assumption.

Unlevel Premiums and Benefits

Some non-can policies provide that the premium shall be increased at a given age and the benefits reduced at a later age. One purpose of such provisions is to reduce the active life reserve below the level premium standard by increasing the present value of future premiums and by reducing the present value of future benefits. Formula (4) can be modified for such policies, as follows:

$$(15) \qquad \frac{{}_uK_x + A \cdot {}_yK_u}{{}_vN_x + B \cdot {}_yN_v}$$

where $u =$ age at which benefits are reduced,
$A =$ ratio of reduced benefits to original,
$v =$ age at which premium increases,
$B =$ ratio of increased premiums to original,
$x < v$; $x < u$; and in practice $v < u$.

At certain ages and durations this formula will lead to negative reserves, which means that if actual experience follows the expected the company will pay out excess benefits in the hope of collecting excess premiums later. If B is a high ratio, or A very low, such negative reserves may present an acute problem. For that reason care must be taken in assigning the values of A and B. Some conservative actuaries value such policies as if they were three separate contracts, one to age v

$$(16) \qquad [PS]^a_x = \frac{{}_vK_x}{{}_vN_x}, \qquad (x < v)$$

the second from age v to age u

$$(17) \qquad [PS]^b_x = \frac{{}_uK_x}{B \cdot {}_uN_x}, \qquad (v \leqslant x < u)$$

and the third above age u

$$(18) \qquad [PS]^c_x = \frac{A \cdot {}_yK_x}{B \cdot {}_yN_x}, \qquad (u \leqslant x < y).$$

The unlevel premium and benefit plan has also the result of reducing the annual premium for the earlier years of the policy, and of reducing the difference between the annual premiums graded by age at issue. It is characteristic of short-term coverages that the term premiums form a much flatter curve than for long-term coverages. An unlevel premium plan applied to a short-term policy may have the result that the age 49 annual premium is only slightly higher than the age 20 annual premium. Such a result would enable the company to charge a single flat gross premium for all issue ages from 20 to 49, and that is most often done for short-term policies. For long-term policies, however, the annual differences are such as to require the gross premium schedule to be graded, like life insurance, according to age at issue.

Disabled Life Reserves

From a formal viewpoint the reserve on a disabled life is to be valued as an annuity payable monthly during disability, subject to appropriate policy limits. The symbol $a^{t(12)}_{(x)+t/12}$ stands for the value, at the end of the t^{th} month of disability, of a life annuity with first payment due in one month and subsequent payments due monthly during disability, for a life disabled at age x. The symbol $a^{t(12)}_{(x)+t/12:\overline{k+m-t/12}|}$ is the corresponding value of a temporary annuity limited to m years after a waiting period of k. If the annuities are computed from disabled life mortality tables they will include the last full payment to each disabled life, but will not include any fractional part of a month's indemnity accruing between such payment and recovery or death. A correction could be made by assuming that each recovery contributes one-half of a month's additional disability, and by valuing those contributions. The present value of such contributions must always be less than one-half the value of one month's indemnity; substantially less as the remaining term of the annuity becomes shorter. One-half of one month's indemnity is approximately 1% of the value during the early years of a 103 months temporary annuity on a life disabled at age 40. The annuity (omitting the correction) can be computed by developing regular commutation columns, monthly; as

$$D^{t}_{(x)+t/12} = l^{t}_{(x)+t/12} \cdot v^{x+t/12} \tag{19}$$

$$N^{t(12)}_{(x)+t/12} = \sum_{n=0}^{n=12(\omega-x)-t} D^{t}_{(x)+\frac{t+n}{12}} \tag{20}$$

$$_{(x)+k+m+1/12}N^{t(12)}_{(x)+t/12} = N^{t(12)}_{(x)+t/12} - N^{t(12)}_{(x)+k+m+1/12} \tag{21}$$

whence

$$12 \cdot a^{t(12)}_{(x)+t/12} = \frac{N^{t(12)}_{(x)+\frac{t+1}{12}}}{D^{t}_{(x)+t/12}} \tag{22}$$

and

$$12 \cdot a^{t(12)}_{(x)+t/12:\overline{k+m-t/12}|} = \frac{{}_{(x)+k+m+1/12}N^{t(12)}_{(x)+\frac{t+1}{12}}}{D^{t}_{(x)+t/12}}. \tag{22A}$$

The correction for the accrual after the last payment before termination can be estimated approximately by the formula

$$(23) \qquad 12 \cdot \Delta_{(x)+t/12:\overline{k+m-t/12}|} = \frac{l^{(1)}_{(x)+t/12} - l^{(1)}_{(x)+k+m}}{24 \cdot l^{(1)}_{(x)+t/12}} .$$

This formula is conservative to the extent of the interest assumption which is disregarded. Values calculated with this correction for an annuity of 100 months after a 3 month waiting period are shown in Column (1) of Table IV.

TABLE IV

Value of $1.00 Monthly Select Temporary Annuity
103 Month Term—Class (3)—3%
Age 40 at Disability

n	Col. 1 Formulae (22A) and (23) Adjusted True Monthly Annuity	Col. 2 Formula (24) Approximate Monthly Annuity Based on Amount of Sickness	Col. 3 Formula (27) Approximate Monthly Annuity Adjusted from Annual	Col. 4 Formula (26) Annual Annuity
1	40.3	40.9	40.9	45.4
2	44.5	45.2	44.8	48.5
3	44.3	44.9	44.5	47.5
4	41.2	41.8	41.4	43.7
5	35.4	35.9	35.6	37.3
6	27.4	27.8	27.6	28.7
7	17.7	17.9	17.8	18.4
8	6.8	6.9	6.9	7.0

The annuities can also be valued along lines similar to Formula (7A) on page 50 above, using amounts of sickness rather than separate payments of indemnity. This method requires disability tables showing both $s^{n/1}_{(x)}$ and $l^{(1)}_{(x)+n}$. It is rather cumbersome to apply in any way other than annually at anniversary dates. Such annual values are shown for comparison in column (2) of Table IV. They include all indemnity expected to accrue in the future without necessity for considering any correction on account of the part-month accruing immediately before termination. The formula is

$$(24) \qquad a^{(12)}_{(x)+n:\overline{\frac{103}{12}-n}|} = \frac{\sum_{t=0}^{t=\frac{103}{12}-n} v^{n+t} \cdot s^{(n+t)/1}_{(x)}}{v^n \cdot l^{(1)}_{(x)+n}} .$$

In applying the formula the amount of sickness in the last year is not for a full year, but for only a part thereof. That correction should be understood in interpreting $s^{8/1}_{(x)}$, which is really $s^{8/7/12}_{(x)}$. The excess of the values of Column (2) over those of Column (1) is due to the arbitrary differences in the treatments of the interest assumption.

With unlimited life indemnity the monthly annuities can be approximately derived from annual annuities by the relationship

$$a^{t(12)}_x = a^t_x + 13/24. \tag{25}$$

This formula is not directly applicable to the select temporary annuities which characterize non-can today. The values of

$$12 \cdot a^t_{(x)+n:\overline{\frac{103}{12}-n}|} \tag{26}$$

given in Column 4 of Table IV demonstrate that the adjustment to the monthly annuity is not a constant. A close approximation can be made, however, by the following formula

$$a^{t(12)}_{(x)+n:\overline{m+t-n}|} = a^t_{(x)+n:\overline{m+t+6/12-n}|} - 1/2. \tag{27}$$

Values computed by this formula are shown in Column (3) of Table IV. In applying the formula the payment at the beginning of the final year was adjusted to the appropriate part of the full year.

Formula (24) or (27) can be used to calculate values at anniversary dates, and intermediate monthly values can be interpolated if desired. Assuming valuation on the average at the middle of a disability month, the mean monthly annuity for the t^{th} month would be the mean of the annuity at the beginning of the t^{th} month (next payment due at the end of the month) and the annuity-due at the end of the t^{th} month (payment due immediately): or

$$1/2 \cdot \left\{ a^{t(12)}_{(x)+\frac{t-1}{12}} + a^{t(12)}_{(x)+\frac{t}{12}} \right\}. \tag{28}$$

Formula (28) values the full payment due at the end of the t^{th} month; that is, it includes both the accrual up to the average valuation date since the payment at the end of the $(t-1)^{th}$ month and the amount which will accrue after such date and

before the next payment. Any other accrued and unpaid indemnity must be valued separately.

Very few companies have exposure enough to base long-term annuity calculations upon their own experience. Most companies must adopt some experience not their own. The Conference Committee recommended Class (3), as extended in its report, as a basis for valuing claims which have lasted one year or longer from the date of disablement[19]. Non-can policies are offered and bought as a type of insurance complete in itself, rather than as a clause supplementary to another type of insurance. This fact, combined with the more active claim supervision shown by non-can companies, leads to the expectation of more claims presented under a non-can policy—even with identical waiting period—followed by more rapid termination for the first few months. After the sifting out of the more numerous but less costly short claims, the termination rates and the relative frequencies of the two types should approach each other. Such early divergency followed by later convergence was noticed in the experiences analyzed as Classes (1), (2) and (3), and a marked difference even from Class (3) has been noted in the first disability year experience on long-term, long-waiting period non-can policies. The differences were recognized in the Committee's modification of Class (3) to fit more nearly the special non-can needs.

The foregoing discussion applies to the valuation of long-term non-can claims, but it holds only academic interest in connection with short-term claims. There are better ways of valuing short-term claims than computing formal annuity values. With short-term policies the frequency of claims is much greater because of the usual shorter waiting periods. The maximum loss is much lower, and the values by age vary but little. Under these conditions there is no need to go through formal calculations of the sort outlined above. The Conference Committee, for example, recommended for claims of less than a year's duration that reserves be set aside in such manner as the company's calculations justify[20]. This standard allows for the application of average claim values. One method is to observe the average run-off of such claims outstanding at December 31 of each year, and to derive

[19] 1940 Report, *supra.*
[20] 1940 Report, *supra.*

therefrom an average with which to value such claims outstanding at a subsequent December 31. This method works reasonably well if the policies exposed are fairly uniform in size and nature, and so long as no epidemic strikes shortly before the valuation date. If the policies exposed vary in size a more reliable valuation can be obtained by computing the average as a given period rather than as a given amount. An epidemic generally creates a large number of claims of short average duration. The regular average applied to a claim list which includes a large number of epidemic claims will generally result in a substantial overvaluation. Contrariwise, if the valuation follows a short period of exceedingly good health throughout the country, the list will contain a greater-than-average proportion of longer, more serious claims. The regular average would undervalue such a list. The most satisfactory course is to prepare a separate average for each of a number of durations. Claims incurred in December and still outstanding at the end of the year may be valued at x weeks of indemnity; those incurred in November at y weeks; and so on as the company's experience may indicate. The number of weeks of indemnity used as the factor may not be the actual period which the average claim is expected to run. Other benefits—hospital, surgical, etc.—may be included in the liability, and some measure of accrued but unpaid benefits will necessarily be present. The factor may be developed simply as the number of weeks for which the indemnity would be equal to the actual liability for such benefits together with the regular loss of time indemnity.

Two observations may be made on that general method. The first is the warning—scarcely necessary—that the average size of all claims settled by a company is not a satisfactory average to apply to claims outstanding at a given time. The outstanding list is very much more heavily weighted with the more serious claims, which remain longest on the book. The most numerous claims are the shortest and least costly, which have a big effect on the general average but which are settled so quickly that relatively few of them are outstanding at any time. The second observation is that an average of claims outstanding at December 31 is not necessarily applicable to claims outstanding at some other time. Short-term disability claims have a definitely seasonal cast; claims incurred in December may have an altogether different average from

claims incurred in June. Valuation averages developed for one date should be tested before assuming that they will be satisfactory at another date.

The Conference Committee made a suggestion with regard to checking the claim reserves actually set up. Schedule O lumps together all claims which were outstanding at the end of the previous year, thus obscuring the effect of a possible inadequate or redundant valuation basis for older long-term claims. The Committee's suggestion was a modification of Schedule P—Part 5, wherein each year a new valuation of outstanding liability is added to actual payments to date, subdivided by the calendar years in which the claims were incurred, and the result compared with previous similar totals. In this way a trend may become apparent, indicating either inadequate or redundant reserves. One method would be to start with the first year's reserves for claims incurred in the year 1940, for example. At the end of 1941 add payments made in 1941 on claims incurred in 1940 to the current reserves for such claims still outstanding, and compare the result with the first reserve at the end of 1940. At the end of 1942 add payments made in 1941 and 1942 to current reserves, all for claims incurred in 1940, and compare the result with the previous two years' estimates—and so on, until the 1940 claims are all settled; and similarly for each calendar year's claims. A variation of this method is to include all payments made in 1940 on claims incurred in 1940, not just payments made after the 1940 year-end valuation. Each successive year's sum is thus an estimate of the total losses incurred in 1940, and may be compared with earned premiums to get developed loss ratios for each calendar year separately. If a trend is present it will show up in either variant of the method. The Conference Committee warned, "It should be noted that a period of several years may be required to reach reliable conclusions as to whether the reserves set up have been too large or too small. The longer the period of time during which benefits are payable under a policy, the greater is the fluctuation in remaining reserves likely to be from year to year. The outstanding claim liability may also be influenced by such factors as the average period since issuance of the policies exposed, and the current phase of the economic and morbidity cycles. A favorable run-off of reserves should not, therefore, be considered

as justifying, without thorough study and analysis, a possible relaxation of the application of the recommended standard."[21]

Valuation Basis

Active life reserves are the nucleus of the accounting device which permits a company to charge a level premium for a risk with an unlevel cost. The excess or unearned portion of the level premium in early policy years is set aside and reserved until needed to supplement the level premium when it becomes insufficient to meet the increased cost in later policy years. The reserve is a liability of the company, and the basis on which the liability is to be valued is important. The relative merits of net premium valuation and gross premium valuation have caused much discussion in life insurance circles, and the same general principles apply to the valuation of the reserve on non-can policies.

The insurance policy is a contract which the company is obligated to fulfill *in toto*. The total cost of fulfilling the contract is composed of benefits to policyholders plus the cost of administering the insurance. The net premium covers benefits alone, and the gross premium is loaded to cover all costs. No company can pay the net claim costs and ignore its other expenses, and the actual total liability under the policies would seem to be most closely estimated by the gross premium reserve, which is equal to the excess of the present value of all future costs over the present value of future gross premiums. In practice policy reserves are calculated as equal to the excess of the present value of future claim liability over the present value of future net premiums. Such net premium valuation is a heritage from the established life insurance practice in this country, and its general use makes it imperative to understand its meaning and its implications. Benefit payments to policyholders are, of course, the most important part of the non-can policy liability and the part which increases most significantly with the passing policy years. Net

[21] 1940 Report, *supra*. This is a timely point to acknowledge the profit which the author derived from the discussions of the Conference Committee, and to state that while many of the thoughts expressed herein should properly be credited to other members, the paper is not to be considered a statement of the Committee's beliefs. The faults are the author's alone.

premium valuation focuses attention on this aspect, but failure to recognize the incidence of other costs could conceivably result in embarrassment to a company.

If all expenses other than benefit payments were the same each year, the loading on current premiums would pay all current expenses. With such level incidence of expenses, gross premium valuation and net level premium valuation would be identical. But expenses are not level for non-can policies. The expenses for which the net premium must be loaded are, broadly, acquisition cost (including here all agency expense), underwriting cost, premium taxes, claim administration expense, and general home office expense. Each of these could be a complete subject in itself, but for brevity's sake certain assumptions may be permitted in this discussion. Non-can acquisition cost is characterized by a high first-year commission and lower renewal commissions. Underwriting costs, including the fees for medical examinations and inspections, are all incurred before the policy is issued. Premium taxes are approximately level, subject only to increases by state governments in the rates of taxation. The general home office expense of an established company may be presumed to be level. The cost of claim administration is roughly proportionate to the claim payments themselves, and consequently increases as policies grow older. Of the five broad components, therefore, premium taxes and general home office expenses can be set aside here as being level and thus not affecting the relationship between gross and net premium valuation. First year commissions and underwriting expenses cause a high incidence of cost in the first policy year; subsequent year commissions may be level or decreasing, according to the individual agency plan; and claim administration expense shows an increasing trend. These three factors, therefore, affect the relationship in various and opposite degrees.

Under a gross premium valuation, and from a realistic business viewpoint, provision must be made to pay the increased claim adjustment costs of later policy years. In actual practice various expedients are usually available to make the total year by year renewal expenses come within a level loading, so that the general pattern of the non-can expense load can be assumed to be a high first year cost followed by level renewal costs. This pattern creates differences which exist between the valuation bases. If net

premium valuation is applied on a full level premium basis, the company must set up at the end of the first year the same reserve which it would set up if the expense load were level throughout. To finance the extra first year cost in addition to setting up that reserve the company must draw on surplus funds. Such a drain upon surplus is an unnecessary burden upon a growing company. That the burden is unnecessary follows from the nature of the gross premium, which is determined as an annuity-due whose value is equal to the present value of all costs. Assume, for example, that total first year costs just equal the gross premium. At the end of the year the present value of future gross premiums is still equal to the present value of all future costs. Under these circumstances no reserve is necessary to assure the company's solvency. The full net level premium reserve is an extra safety margin, and is therefore conservative, but conservatism can be carried to a destructive extreme. Mr. Shepherd said recently, "It is particularly worthy of note that there seems to be no record of a company which has established itself in the United States on the net level premium reserve basis when its business has been confined strictly to non-participating ordinary life insurance."[22] This statement would also apply to non-can, which in this respect differs only in degree from non-participating ordinary life insurance.

Gross premium valuation recognizes that in practice a company which cannot make provision to pay expenses is as truly insolvent as a company which cannot provide for its net insurance liability. It further recognizes that every premium paid is a gross premium. A company does not collect a premium to meet net claim costs without collecting the expense loading at the same time. Benefit payments represent a sort of preferred obligation, it is true, but the expense load is an obligation which is just as binding for all practical purposes, and every dollar of the gross premium is just as valuable as every other dollar. In recognizing these facts, gross premium valuation is more realistic than net level premium valuation. It is not without its own weakness, however. The arguments in its favor are strongest when first year expenses do not exceed the gross premium. When the initial expenses are so large as to require actual cash outlay over and above the premium

[22] XXVIII R.A.I.A. 231 (1939).

received, the gross premium basis develops a negative reserve. Theoretically a negative reserve is an asset, but it is an asset of uncertain value. It counts absolutely on the collection of subsequent premiums, and an over-heavy lapse would impair its value. In practice negative reserves from any cause are disregarded, thus offsetting the weakness to some extent, and incidentally making it necessary to finance new business from surplus, even on a gross premium basis.

There is no intention here of arguing for or against the adoption of the gross basis. This discussion is simply a background to show the logic behind the general use of the full preliminary term basis in valuing non-can policies. Gross premium valuation is on its strongest ground when the first year reserve is not negative; that is, when the first year premium equals or exceeds the total assumed cost. When premiums just equal costs in the first year, and the expense load in subsequent years is level, the gross premium basis develops reserves identical with those on the one-year full preliminary term basis[23]. The full preliminary term basis is a net premium valuation which does not impose the burden of a first year level premium reserve and which avoids the possible early negative reserve of the gross premium basis. The one year full preliminary term basis considers that in the first year the policy is a one year term contract, so that the entire first year premium is available to pay first year claims and expenses. Thus there is no unearned premium at the end of the year. Any excess of costs over premium is paid from surplus, thereby avoiding negative reserves. Starting with the second policy year the expense load is assumed to be level. On the assumption that the policy was issued at the beginning of the second policy year, with the premium based on the age at that date, all differences between the valuation plans disappear. With the first year eliminated, the net level premium basis, the gross premium basis, and the full preliminary term basis all develop the same reserves. The full preliminary term plan is thus a sound and acceptable compromise, and is firmly established as a satisfactory basis for determining the unearned premium under non-can policies.

There is no need to consider a modified preliminary term basis

[23] This is not true if the policy provides an increase in the gross premium at some age. The comparison would then depend upon the increase.

for non-can. The policies are term contracts of pure insurance, with no investment element. There is nothing comparable to the endowment insurance which makes a modified preliminary term basis preferable for life insurance valuation. The select and ultimate valuation basis also need not be considered here, partly because if there is any select period at all it is very short, and partly because the basis is subject in less degree to the same criticism which is made of the net level plan.

Gross Premiums

In calculating the gross premiums at which his company will guarantee the insurance for a long span of years the actuary must have reasonable assurance that his basic assumptions will be conservative. A slight inadequacy in premium may cause no more serious hardship than retrenchment in expenses, but a larger inadequacy can bring financial disaster, and has done so more than once. With conservative underwriting short-term non-can has been written successfully with net premiums at a level approximately equal to 125% of the Conference Table. With extremely conservative underwriting it is possible that the experience of long-term non-can may be no greater than 125% of the Conference Table, but for safety's sake net premiums are customarily figured today on a higher modification. The premiums must make provisions for a possible adverse future trend of disability. In recent years the cost of disability has been showing an improved trend, but the improvement may be temporary or may be only an apparent improvement due to better economic conditions. It has long been held that the advance of medical science has bettered mortality at the expense of disability experience. Comparison of the successive Manchester Unity investigations supports this contention. On the other hand, medical science has practically eliminated many serious acute and epidemic diseases, and has made progress on checking degenerative conditions. It is not at all inconceivable that many types of degenerative conditions will some day be brought under control. The recent favorable trend may even be a reflection of that campaign. If so, net premiums figured on the assumption of an unfavorable trend will prove to be more than conservative. It

would certainly not be conservative today, however, to base net premiums on the assumption that the recent trend will continue.

The net premiums must be loaded for the cost of conducting the insurance, and for this purpose the full preliminary term basis has become firmly established in the non-can field. In finding the gross premium to be charged for issue age x on the full preliminary term basis the net premium at age $x+1$ is loaded for renewal costs, which will vary among companies but which for long-term policies will probably be something like 20% for agency (including the renewals' share of supervision cost), 12 to 14% for administration, 3% for taxes, and 5% for claim adjustment (subject to increase, possibly financed from a reducing agency cost); or a total of 40-42% of gross, plus provision for profit. This premium should be compared with the sum of first year costs, which for long-term coverage will include underwriting expenses (including the expense of rejected applications) of 15 to 20%, agency expense (including cost of development) of around 60%, taxes, general home office administration, and claim administration of about 20%; or a total of very nearly 100% before considering the one year term claim cost, which may be lower for long-term policies than for short-term. When the total exceeds the computed premium, the premium must obviously be increased according to some plan of amortizing the excess. Unless the excess is taken care of all at once—that is, unless the gross premium is increased by the full amount of the excess—there will be an initial investment to be financed from surplus. This investment increases the necessity of careful planning for the financing of new business, and of designing the amortization plan conservatively in order to assure that the investment will be returned.

The actual loading has been applied sometimes as a given percentage of the gross premium and sometimes as a flat loading plus a percentage. Commissions and taxes, and possibly claim adjustment expense, depend directly on the amount of the premium, so that a percentage loading is dictated for them. The net premium on a policy issued at age 50 may be as much as twice the net premium on a policy issued at age 25, but the costs of home office supervision and of underwriting are apt to be much the same whatever the age of the policyholder. A flat loading for these items, therefore, seems to be fairer and sounder. Otherwise

the man who applied at an older age is made to subsidize the younger applicants, and any reduction in the average issue age would have the effect of reducing income from loading, possibly to an inadequate level. The percentages in the preceding paragraph are intended merely to suggest the relative importance of the various broad items of expense. The loading would vary among companies, depending on such factors as volume of premiums, type of agency organization and type of policy. A small premium volume, for example, does not allow economies in organization which could reduce general home office and claim administration costs. The cost of the agency organization may itself depend on the type of policy. The market for long-term non-can, for example, is smaller than for short-term. The effort per sale is greater and the number of sales is lower. An agency force selling only long-term policies would require a larger unit return than a force to which the broader market is open. The underwriting of short-term non-can may be less costly because it is at least partly nonmedical. On the other hand, the difference between the net level premium at age $x+1$ and the net one year term premium at age x is less for short-term policies than for long-term so that claims consume a larger part of the first year premium. The result may be an even higher initial investment for short-term non-can than for long term. Such individual variations should be studied and understood in applying any plan of loading the premium.

Nonforfeiture

The unlevel acquisition cost of non-can which occasions the initial investment is made possible only by the long term of the contract, which may be as much as forty or forty-five years. A protracted contract of this sort is found only in the branches of insurance involving life contingencies, and the non-can company has some problems in common with life insurance companies. One such problem is that involving forfeiture of the active life reserve, which is closely analogous to the reserve on a term policy of life insurance; for a non-can policy is precisely a term policy to age 60 or 65, as the case may be. The non-forfeiture provisions of life insurance policies were imposed by legislative action to

prevent loss to policyholders of the substantial equities which arise from the investment element inherent in most life insurance plans. Endowment plans of insurance, of which the whole-life plan is a special type, require the certain payment of a known sum, and consequently the reserves grow very considerably larger than under plans of term insurance where the payment is not certain and where the honest policyholder has no investment purpose in taking out the insurance. Both the investment and the pure protection plans, however, develop at least a small reserve, because an increasing cost is insured at a level premium. The policyholder has an equity in the reserve which can always be realized by exercising his right to continue the policy throughout its entire term. This is as true of disability insurance as of life insurance. That is the only interest the policyholder has in the reserve so long as the policy is in force. The problem of nonforfeiture values arises only when the insurance is terminated prior to the end of the specified term.

Nonforfeiture provisions are based on the premise that an individual should not be required to forfeit upon lapse any equity which he may then have in the reserve. That premise is generally accepted as sound, and problems arise only in determining the amount of such equity and the manner and extent of the recognition thereof. Properly speaking there is no "reserve" set against an individual policy. Insurance is not an individual function, but is a sharing of risk among a number of individuals. Premium and reserve accounting against an individual risk is simply placing a bet based on mathematical probability. Only with the distribution of the risk over a reasonable number of individuals does the law of averages turn the bet into an insurance operation. Such distribution prevents the reserve from having any individual nature. Speaking in broad terms, the reserve is the aggregate amount by which the present value of future premiums to be collected from the entire group of individuals is inadequate to balance the present value of the future costs under all the contracts in the group. The aggregate reserve is calculated by the use of average factors, and for policies actively in force it is customary to speak of the policy value as being equal to the proportionate share of the aggregate reserve. This custom is not objectionable if the limitations are understood. The only

practical impropriety in the custom is the confusion created in the lay mind when the subject changes from active policies to lapsed policies.

It has been generally recognized in life insurance circles[24] that the amount of the policyholder's equity in the reserve at the moment of lapse is not necessarily equal to the proportionate share of the reserve at the moment before lapse. An active policy carries its share of net cost and overhead expense and contributes to the spread of risk which transforms the operation from wagering to insurance. Premature termination of such sharing impairs the position of the remaining participants. The cost of such impairment should be borne by the lapsing policyholder rather than by those remaining. The extent of the impairment is impossible to determine closely for disability insurance, at least at the present stage of its actuarial development, because the experience to be expected on disability insurance is not thoroughly established, and because the nature of the moral hazard creates a very significant extension of the anti-selection inherent in lapsation, the degree of which cannot be accurately measured. The amount by which the company and its remaining policyholders are damaged by lapses can only be crudely estimated; and so small is the reserve on even long-term disability policies, compared to most life insurance plans, that a conservative estimate of the damage very nearly, if not entirely, wipes out any equity of the lapsing policyholder. A very small nonforfeiture value may be worse than none at all, partly because of the bother and expense of accounting for small sums and largely because the very smallness thereof may cause dissatisfaction. A Scottish actuary[25], explaining why surrender values are not given on disability insurance by his company, said, "If the Company has made a point of advertising the Surrender Value in its prospectuses, the Policyholder makes as much as possible of the dissatisfaction. Too frequently he compares with the premiums paid the Surrender Value offered for the Continuous Disability Policy and the Surrender Value which has been quoted to him for a Policy taken out under the Endowment Assurance Plan in some Life Office, and

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[24] For example, "Report of the Committee to Study the Need for a New Mortality Table and Related Topics," Chapter VI.

[25] W. A. Robertson, XIV T.F.A. 66.

it is difficult to make it clear to him that there can be no comparison as between the two contracts." If the time comes when the effect of lapse can be more accurately evaluated it is conceivable, though improbable, that a small nonforfeiture value may be established on long-term high-reserve disability policies issued thereafter. Such nonforfeiture value, if it should arise, would undoubtedly be expressed as some type of extended term insurance. A cash value would be unfortunate, for it would needlessly accentuate the financial strain normally suffered by disability companies in periods of economic depression, and would create extra incentive to lapse a policy whose sole purpose is protection. It would introduce a banking or investment element utterly foreign to the nature of the insurance. In the short-term low-reserve field no true nonforfeiture provision is probable even if present difficulties should be cleared away, and unless that time comes there is no proper place even in long-term policies for any such provision.

Investment

At one time the presence of relatively high reserves created the possibility of excess interest earnings. The disposition of excess interest is no problem today, particularly to a company valuing at 3½% and paying federal income taxes on its entire coupon income to boot. The chief concern in investing the assets held against non-can reserves is to be sure that the principal remains intact. Portions of premiums collected today may not be used for 10, 20 or even 30 years from now. The liability is expressed in dollars so that possible change in the purchasing power of money is not a major problem in investing the assets held against the reserves. It is more important to conserve the principal than to earn a big return thereon. A possible inadequacy of net yield may be a simpler problem to meet than an inadequacy of principal, and high yield does not commonly go hand in hand with safety.

Adjustments to the Statutory Underwriting Exhibit

The Underwriting Exhibit of the Casualty and Miscellaneous Blank makes no provision for interest earned on account of

reserves, although the reserve calculations assume such interest. The entire amount of assumed interest in active life reserves is actually taken out of premiums by the statutory formula, so that "premiums earned" is understated by that amount. Similarly "losses incurred" is overstated by the amount of interest assumed in disabled life reserves. The statutory underwriting results for non-can, therefore, must be corrected for the interest assumption before a true picture of operations can be determined.

An adjustment must also be made for underwriting expenses if the volume of non-can being written has not become stabilized. The expenses of a growing non-can company cannot be compared with the level expenses of a general casualty company, or even with the stabilized expenses of a mature non-can company. As already stated, non-can policies have a high first year expense load and a lower load in subsequent years. A growing company perforce has a higher percentage of first year business than a mature company, so expenses are correspondingly higher than for a company whose business has leveled off. The resulting high statutory expense ratio is not abnormal, nor is it undesirable provided the growth is not too rapid. The effect of the unlevel expense load must be recognized, however, in laying plans and in analysing the incidence of costs.

The Future of Non-Can

Only time holds the answer to the question, "What will be the future of the non-can business?" There is a wide need for the types of insurance offered by non-can companies. Men familiar with non-can believe that if the moral hazard is controlled the need can be largely satisfied. Control of the moral hazard lies in the company and its underwriting attitudes. For that reason non-can will probably be written by companies with no other lines or whose other lines are kept completely subordinate, for only such companies will be in a position to give whole-hearted attention to the non-can operations or to undertake the requisite control of agency underwriting. If a company has the necessary degree of self-control to keep the moral hazard in line, the dangers of the business will be found not so much in loss experience as in acts bearing directly on the business by men unfamiliar with its

requirements. Legislatures and insurance departments cannot make non-can, but they can break it. As in any other field, failure to understand principles can lead to unfortunate misconceptions. Such misconceptions have more than once caused government officials to make moves which were not in the best interest of either the business or the public. The future of non-can lies not only in the companies themselves but also in the hands of those who have the power to make or to refrain from making unintentionally destructive legislation or rulings.

Conclusion

To guide and coordinate the efforts of the various departments is the job of management. Each department must pull its weight and must respect the spheres of the others. Weakness in just one department alone may prevent the successful conduct of the business, and the same can be said of interference by one department in the conduct of another. Agency management, claim administration, underwriting and investment are all fields for experts. This paper has not attempted to treat those fields from the experts' viewpoints. It has tried to discuss from the management viewpoint the relationship of the fields with one another, and to show wherein each contributes to the success of the whole.

The right arm of management is the actuary, and the non-can actuary must understand the problems and the inter-relationships of the departmental experts. Mathematical formulae and theories are not nearly enough. Human nature permeates the non-can field and human nature cannot be forced into the shape of a theoretical formula. Non-can must have a sound actuarial foundation, but that foundation must be realistic and independent in its recognition of human nature, and it must be thorough in its coordination of the best efforts of those engaged in the business. Upon such a foundation, honestly laid, can be erected a structure which may lack something of mathematical exactness but which promises to be both sound and socially desirable.

EXCESS COVERAGE (PER ACCIDENT BASIS) FOR SELF-INSURERS: WORKMEN'S COMPENSATION—NEW YORK

BY

JAMES M. CAHILL

In 1927, Mr. Paul Dorweiler presented a paper entitled "Observations on Making Rates for Excess Compensation Insurance" which is contained in Volume XIII of the Proceedings. Mr. Dorweiler commented upon various forms of partial coverage and outlined certain ratemaking studies which had been made to that date. Included in this survey was excess insurance per accident, which affords coverage for losses in excess of a fixed limit per accident. The assured retains his obligations up to a fixed amount for each accident and insures the portion of losses in excess of this fixed amount.

Since that time, the subject of excess insurance per accident has been given further consideration in a number of states and various ratemaking formulas have been employed in different jurisdictions. The purpose of this paper is to outline the developments which have taken place in New York with regard to this form of coverage since the preparation of Mr. Dorweiler's paper.

In 1930, the Superintendent of Insurance issued the following decision which has been regarded as a landmark ever since as respects the various forms of excess compensation coverage in New York:

Decision in the Matter of Excess Compensation Coverage for Self-Insurers

Employers who qualify as self-insurers frequently purchase insurance to protect themselves against excessive losses resulting from the occurrence of a catastrophe. This form of coverage is legitimate, and reasonable provision should be made for furnishing it. The principal interest of the Insurance Department at this time is that the form of coverage made available should be catastrophe coverage and not a form to be used for competing unfairly with full coverage.

I therefore rule that all forms of excess coverage, deductible average, stop loss or aggregate excess coverage, etc., other than full coverage or ex-medical coverage, applicable to risks within this State, whether issued by a reinsurance or a direct writing company, shall be submitted to me for approval before they may be used.

(signed) Albert Conway
March 6, 1930 Superintendent

It will be noted that all forms of excess workmen's compensation coverage for self-insurers are construed, in effect, to be direct insurance and not reinsurance, and are therefore subject to regulation by the Insurance Department. Furthermore, such excess coverage must be essentially catastrophe coverage and not of a form to be used in competing unfairly with full coverage.

In accordance with this decision, the Compensation Insurance Rating Board prepared a standard policy form for excess coverage on a per accident basis for self-insurers which was approved by the Insurance Department. Advisory rates for excess coverage above certain specified limits per accident were calculated. In the schedule of rates by classification, the advisory rates were expressed as a percentage of the corresponding full coverage rates shown in the New York Workmen's Compensation Manual.

The standard form of policy providing excess coverage on a per accident basis for self-insurers was published by the Board in circular letter L. C. 134, dated May 13, 1931. A digest of the plan of excess cover and the principal provisions of the standard policy are summarized below:

DIGEST OF THE PRINCIPAL PROVISIONS OF THE STANDARD POLICY FORM FOR EXCESS COVERAGE (PER ACCIDENT BASIS) FOR SELF-INSURERS

(a) *Plan of Cover*:

The excess cover available to duly authorized self-insurers shall provide indemnification for losses, including medical, in excess of a specified limit ($10,000, $15,000, $20,000 or $25,000 as may be desired) resulting from a single accident, whether such accident involves one or more persons. Such indemnification shall be payable to the self-insurer only when loss payments in excess of the assured's retention for the accident have actually been made.

(b) *Consideration*:

The maintenance of the employer's qualifications as a self-insurer during the policy period and the payment of the premium constitute the consideration for the agreement.

(c) *Insuring Clause*:

The insuring clause provides cover for compensation benefits under the New York Compensation Law over and above the amount of the retention which the self-insurer is obliged to pay at his own cost. The minimum retention is $10,000. The cover includes medical, hospital and funeral expenses under the New York Compensation Law and also protects the self-insurer against excess loss on claims and suits for damages under employers' liability laws of the United States and Canada. Medical expenses under employers' liability are excluded. All costs of litigation and defense and all interest charges are to be pro rated. An upper limit to the company's total liability per accident may be stated in the Declarations.

(d) *Definitions*:

The term "accident" is defined as an event involving injuries to one or more persons. Occupational diseases under the New York Compensation Law having a common origin and related to a definite time within the policy term are included. Only accidents occurring within the term of the policy are covered. Other definitions cover the term "employee" and the term "retention."

(e) *Provisions of Section 167 of New York Insurance Law*:

The provisions of Section 167 of the New York Insurance Law (as recodified in 1939) are incorporated in the contract. The company is made liable, in the event of the insolvency or bankruptcy of the self-insurer, to the claimants to the same extent as would apply if the self-insurer had remained solvent. The liability of the company is extended to cover any failure or default on the part of the self-insurer to comply with any obligations to the claimant, but only for such portion of the judgment as exceeds the retention of the self-insurer. The statutory provision respecting notice is also made part of the policy.

(f) *Determination of Premium*:

The remuneration of employees furnishes the basis for the premium and its determination is in accord with the usual provisions found in the full cover compensation contract.

(g) *Cancelation*:

The policy may be canceled upon ten days notice given by either party to the other party and to the Industrial Commissioner. Cancelation is on a short rate basis if made at the self-insurer's request. If cancelation is at the company's request, or because the self-insurer is retiring from the business described, the premium is computed on a pro rata basis.

(h) *Inspection and Audit*:

The company is permitted to inspect the self-insurer's establishment during the policy period. It has the right to audit payroll accounts during the policy period and within one year after its expiration. The company is privileged to examine the books relating to loss payments within one year after the final settlement of all claims.

(i) *Notice and Settlement of Claims*:

The self-insurer is required to give notice of all accidents which may involve an excess loss. The self-insurer is made responsible for the investigation and settlement of such claims. The company has the right to participate in the negotiations for settlement or in the defense of any suit. No voluntary settlement is to be made without the consent of the company.

(j) *Assignment and Subrogation*:

The interest of the self-insurer may not be assigned. If there is additional insurance for excess cover, the liability of the company is in proportion to the total amount of excess insurance. The company is given the right of subrogation where either the self-insurer or the claimant has the right of recovery against third parties.

(k) *Liquidation of Long-Term Claims*:

The policy contains no special provision for the liquidation of long-term claims by a deposit in the Aggregate Trust Fund as permitted by Section 27 of the New York Compensation Law, but if an arrangement to that effect is agreed upon by the parties, the contract may be modified by an appropriate endorsement.

(l) *Declarations*:

The Declarations give the name of the self-insurer, Post Office address, describe the operations conducted by him and the locations to be covered; also show the estimated payroll,

the premium rates, the estimated premium, the minimum premium, the amount of retention (not less than $10,000), and the upper limit of the company's liability per accident. The concluding item gives the signature of the self-insurer which is to be accepted as authorized on his behalf.

In 1940, the Actuarial Committee of the Compensation Insurance Rating Board completed a thorough study of this form of coverage which had been made preparatory to the filing of a proposed rate schedule to supersede the advisory rates established by the Board in 1930. The methods employed in this study and the conclusions reached will be outlined. In addition, a comparison of this proposal with the basis of the present advisory rates will be given for the important elements.

Actual Experience During Policy Years 1928-1937

Preliminary to outlining the ratemaking method developed in 1940, it may be of interest to review the actual past experience for this form of coverage in New York. Exhibits 1 and 2 present certain information on the actual experience incurred during policy years 1928 to 1937 under excess cover for a single accident.

A loss ratio of 70.8% was incurred on a total premium volume of $670,097. This was a very adverse loss ratio for this type of coverage for which the permissible loss ratio would average less than 50%, taking into account the necessary expense provision. For the experience of Board members, the corresponding loss ratio was 35.7%; and for reinsurance carriers, not members of the Board, it was 91.5%. It may be stated that excess coverage on a per accident basis has generally been written at rates lower than the advisory rates calculated by the Board in 1930.

Experience Basis of Proposed Rates

It would not be practicable to determine the proposed rate structure on the basis of the experience of risks written on an excess coverage basis in the past, even though the total actual losses of $474,609 for such risks may seem to represent a sizeable volume. Since the occurrence of losses costing more than $10,000 or some higher limit per accident is infrequent, it is obvious that we must have a broad spread of experience in order to determine

reliable indications. Furthermore, the actual volume of experience has been built up by a repetition of coverage for a comparatively small number of risks and therefore does not encompass a broad cross-section of the business in the state.

The proposed rate structure has been based on a study of the New York experience for policy years 1931-1935 combined for risks written on a statutory coverage basis. From these data, it has been possible to determine the proportion of total losses which is in excess of certain selected limits per accident. By using five policy years of statutory coverage experience in this analysis, a sufficient volume of basic data was available to develop reliable indications by hazard group and per accident limit.

Hazard Group

Each of the classifications, other than the vessel classifications, has been assigned to one of the following three hazard groups:

Hazard Group

A = High
B = Medium
C = Low

In previous studies, classifications were assigned to hazard groups largely on the basis of the relative catastrophe hazard. In connection with this study it was observed, however, that the excess losses on single cases account for a greater proportion of the total excess losses than do catastrophes. In assigning each classification to hazard group, consideration was therefore given to the amount of the serious indemnity pure premium, since this gives an approximate indication of the relative serious frequency, and to the inherent catastrophe hazard of the classification.

The assignment of the classifications to hazard group was made by the Actuarial and Engineering Divisions of the Board in cooperation, thereby reflecting both actuarial and engineering judgment. Exhibit 3 shows this assignment and also, for comparison, the corresponding hazard group assignment which underlies the present advisory rates.

Excess Cost

In order to derive the incurred excess cost on a comparable basis with the incurred total cost of a particular claim, the excess cost was computed on an annuity basis for cases involving life payments and on a terminal value basis for all other cases. For death, permanent total and major permanent partial cases where the estimates of incurred indemnity reflect the use of tables to compute the present value of future payments, the excess cost for specified per accident limits was determined on the basis of annuities deferred from the date of valuation until the available retention by the self-insurer is exhausted. In the case of major permanent partial schedule awards for which the estimates of incurred loss were set up on a terminal value basis, the excess cost was determined by deducting the retention of the self-insurer from the estimated total incurred loss.

In the computations based on deferred annuities, the sum of the paid and accrued indemnity and the incurred medical was deducted from the specified per accident retention to determine the remainder of the retention as of the valuation date. This residue was divided by the annual compensation benefit to determine the number of years that the annuity payments by the insurance carrier would be deferred. This method of calculation takes into account the fact that the insurance carrier will become liable when the self-insurer has made gross payments on a particular accident which aggregate to the amount of his retention. It does provide, though, for the use of an interest discount rate of 3.5% for the tabular cases from date of excess payment to the valuation date of the experience employed in this study.

In the case of catastrophes, the residual portion of the retention at the valuation date was determined by subtracting from the retention limit the sum of: (1) the paid and accrued indemnity and the incurred medical for death, permanent total and non-schedule major permanent partial cases, and (2) the total incurred cost for all other cases involved. The number of years that the annuity payments by the insurance carrier would be deferred was obtained by dividing this residue by the total annual compensation payable to all pensioners. The present values of the deferred annuities to pensioners were summed to obtain the total excess cost of the catastrophe. If the total losses paid or accrued ex-

ceeded the retention limit, the difference was added to the present values of the annuities payable commencing with the valuation date in order to obtain the excess cost.

Exhibits 4, 5 and 6 illustrate these calculations in the case of actual death, permanent total and major permanent partial (reduced earnings) claims. Exhibit 4 also illustrates the treatment of catastrophes wherein the multiple claims are combined in the analysis.

It may be well to mention that it was not possible to treat death and certain types of permanent disability cases as though they were payable into the Aggregate Trust Fund because self-insurers are not required to pay the present value of such cases into the Aggregate Trust Fund as are stock and mutual carriers. Under the Workmen's Compensation Law, it is optional with self-insurers as to whether they wish to take advantage of this method of closing out long-term cases.

Exhibits 7, 8 and 9 show the excess loss results determined for separate limits of $10,000 per accident, $15,000 per accident and $25,000 per accident. These exhibits have been designed to determine the ratio of excess to serious indemnity cost by hazard group. As is customary, death, permanent total and major permanent partial claims are the kinds of injury classified as serious.

Formula for Calculating Present Advisory Rates

The following formula was employed in 1930 in calculating the advisory rates for a $10,000 per accident limit:

$$\text{Excess Rate} = \frac{\frac{\text{Serious P.P.}^*}{\text{Total P.P.}} \times \frac{\text{Excess Cost}^{**}}{\text{Serious Cost}} \times .600}{.80} + .030}{.80} \times \text{Manual Rate}$$

$$= \left(\frac{\text{Serious P.P.}^*}{\text{Total P.P.}} \times \frac{\text{Excess Cost}^{**}}{\text{Serious Cost}} \times .9375 + .0375 \right) \times \text{Manual Rate}$$

* For Class.
** For Hazard Group.

In explanation:

(1) The ratio of the serious pure premium to the total pure premium by class is determined from the adopted pure premiums underlying the New York rate for statutory compensation coverage.

(2) The ratio of excess cost to serious cost is based on the study by hazard group for the $10,000 per accident limit.

(3) The permissible loss ratio of .600 underlying statutory coverage rates is introduced in order to convert the excess loss provision from in terms of statutory coverage losses to in terms of statutory coverage premium.

(4) A flat charge of .030 of the manual rate is provided for fixed company administration and payroll audit expenses.

(5) The loss portion of the advisory rate is divided by .80 in order to provide for claim adjustment, inspection, and the remainder of company administration and payroll audit expenses.

(6) Finally, the result produced by the above steps is divided by .80 in order to include a provision of .175 for acquisition and .025 for taxes. These were the respective provisions which were included in the New York rate structure prior to 1935 when both items were changed.

The rates for other retentions were computed as a function of the rates for a $10,000 per accident limit as follows:

Excess Insurance Above Per Accident Limit of:	Excess Insurance Rate Relativity (As % of Rate for $10,000 Per Accident Limit Retention by Assured)
$10,000	100%
15,000	75
20,000	50
25,000	25

PROPOSED FORMULA FOR CALCULATING RATES

The following revised formula for computing rates for a $10,000 per accident limit is proposed on the basis of the 1940 study:

$$\text{Excess Rate} = \frac{\frac{\text{Ser. P.P.}^*}{\text{Total P.P.}} \times \frac{\text{Excess Cost}^{**}}{\text{Ser. Cost}} \times .598 \times \left(1.000 + \frac{.080 + .020 + .103}{.598}\right) + .010}{(1.000 - (.150 + .039)} \times \text{Manual Rate}$$

$$= \left(\frac{\text{Ser. P.P.}^*}{\text{Total P.P.}} \times \frac{\text{Excess Cost}^{**}}{\text{Ser. Cost}} \times .9873 + .0123\right) \times \text{Manual Rate}$$

* For Class.

** For Hazard Group.

In explanation:

(1) The permissible loss ratio underlying statutory coverage rates is now .598.

(2) A flat charge of .010 of the manual rate is provided for fixed company administration and payroll audit expenses.

(3) Claim adjustment, Department of Labor assessment, inspection, and the remainder of company administration and payroll audit expenses are provided for as a loading on the loss provision, in the same proportion as exists in the make-up of the premium dollar for statutory coverage rates.

(4) The revised rates include a provision of .150 for acquisition and .039 for taxes (including .004 for Social Security Act taxes).

An analysis of the make-up of this expense loading as compared with the corresponding expense loading in the printed manual rates for statutory coverage is given in the following exhibit:

Item	EXPENSE LOADING—NEW YORK			
		Excess Coverage ($10,000 Per Accident Limit)		
	In Printed Manual Rates for Statutory Coverage	Percent of Printed Manual Rate for Statutory Coverage	Percent of Excess Coverage Loss Provision ÷ .598	Percent of Excess Coverage Rate
(1)	(2)	(3)	(4)	(5)
H. O. Administration	7.1%	1.0%	10.3%	
Payroll Audit	1.7			
Inspection	2.5			
	11.3%			
Claim Adjustment	8.0		8.0	
Dept. of Labor Assess.	2.0		2.0	
Social Security Act Taxes	0.4			0.4
Other Taxes and Fees	3.5			3.5
	3.9%			3.9%
Acquisition	15.0			15.0
Total	40.2	1.0	20.3	18.9
Loss Provision	59.8			
Grand Total	100.0%			

The rates for other retentions are to be computed as a function of the rate for a $10,000 per accident limit as follows:

Excess Insurance Above Per Accident Limit of:	Excess Insurance Rate Relativity (As % of Rate for $10,000 Per Accident Limit Retention by Assured)
$10,000	100%
15,000	65
20,000	45
25,000	30

Although the above method of computing the excess coverage rates for retentions higher than $10,000 per accident is proposed as a practical method, the results produced will reflect, on the average, the same type of expense loading formula as was outlined above for the $10,000 per accident limit. This is shown by a comparison of columns (5) and (6) of Exhibit 10. The percentages for excess insurance rate relativity by per accident limit were selected so as to reproduce approximately the results which would be achieved if the expense loading formula were exactly applied in the case of each per accident limit.

Schedule of Proposed Rates for $10,000 per Accident Limit

The schedule of proposed rates by classification is computed for the base limit of $10,000 per accident. These rates are quoted as a percentage of the printed manual rate for statutory coverage. The calculations are based on the pure premium data underlying the July 1, 1940 general rate revision for statutory coverage and the following formulas were employed in making these calculations:

Hazard Group	Excess Cover Rate ($10,000 per accident limit) as % of Printed Manual Rate =
A	$\frac{\text{Ser. P.P.*}}{\text{Total P.P.}} \times 22.9\% \times .9873 + 1.23\%$
B	$\frac{\text{Ser. P.P.*}}{\text{Total P.P.}} \times 19.8\% \times .9873 + 1.23\%$
C	$\frac{\text{Ser. P.P.*}}{\text{Total P.P.}} \times 15.8\% \times .9873 + 1.23\%$

* For Class.

The excess coverage rate in the case of an individual classification is to be computed to three decimal places as the product of the specified percentage for the per accident limit and the printed manual rate.

MINIMUM PREMIUM

A minimum premium of $100 is proposed for excess coverage policies.

UPPER LIMIT PER ACCIDENT AS RESPECTS THE CARRIER'S LIABILITY

Since an upper limit per accident to the carrier's liability may be stated in the Declarations, the following extended table is proposed to permit the determination by interpolation of the appropriate rates for policies providing for an upper limit per accident as respects the carrier's liability:

Excess Insurance Above Per Accident Limit of:	Excess Insurance Rate Relativity (As % of Rate for $10,000 Per Accident Limit Retention by Assured)
$10,000	100%
15,000	65
20,000	45
25,000	30
50,000	15*
75,000	10*
100,000	7.5*

The values marked with an asterisk would not be published but would be employed by the Board only when necessary upon application by the carrier. By plotting these values, a chart is obtained to be employed in determining the appropriate rates for a specified limit per accident of coverage for the carrier above the primary retention of the self-insurer. For example, the rate for $75,000 per accident coverage *above* the assured's primary retention of $10,000 per accident would be 91% (100% − 9% = 91%) of the corresponding rate for an assured's retention of $10,000 per accident with no upper limit on the carrier's liability.

COMPARISON OF AVERAGE RATES BY HAZARD GROUP— PRESENT ADVISORY *VS.* PROPOSED

Exhibit 10 presents a comparison of the average rates, computed as ratio of manual, between the present advisory and the proposed. This study is based on the broad averages of the data for each hazard group. Column (7) demonstrates, however, that the proposed rate schedule represents a substantial reduction in

general from the present advisory rates. Only in the case of the $25,000 per accident limit for Hazard Group A is it indicated that the proposed rate basis is higher than the present advisory basis and here the indicated increase is only 3%.

Test of Effect of Proposed Rates Based on Excess Coverage Risks in Policy Year 1937

Exhibit 11 shows a test of the effect of the proposed rates based on actual excess coverage risks in policy year 1937 to obtain a comparison of the indicated premium charges with those actually applied and also with the premiums which would have been determined by the present advisory rates. In this test, the July 1, 1940 printed manual rates have been employed in calculating the excess coverage rates on both the proposed and present advisory bases. It will be noted that the proposed rates would produce a substantially higher premium in the aggregate than was actually charged in the open market for this business since it has generally been the practice to disregard the advisory rates in writing these policies. The actual premiums do not serve as a good basis for comparison, however, because over a period of years the actual premium charges have been grossly inadequate and a very unfavorable loss ratio for this type of coverage has resulted.

Conclusion

This paper has outlined in considerable detail the study recently made by the Actuarial Committee of the New York Board for excess insurance per accident. The proposed ratemaking method has no official status as yet because the material has not been filed with the Insurance Department. The filing has been delayed because further consideration is being given to certain legal aspects in connection with this form of coverage, in view of the provisions of Section 54, Subdivision 4, of the New York Workmen's Compensation Law. Nevertheless, the indications of this study and the ratemaking method evolved may be of interest to the members of the Society since this form of coverage has application elsewhere.

In view of the fact that there is a good possibility that an extensive ratemaking study such as this may result in the approval by the Insurance Department of the application of excess coverage rates on a mandatory instead of on an advisory basis, the Actuarial Committee recommended that when a specific filing is made the Department afford the reinsurance carriers, which are not members of the Board, an opportunity to review the proposed ratemaking method to determine whether they are in accord with it.

EXHIBIT 1

WORKMEN'S COMPENSATION—NEW YORK

EXCESS COVERAGE—PER ACCIDENT BASIS

Policy Year	Report	Board Members				Non-Member Reinsurance Carriers				All Carriers			
		No. of Risks	Earned Premium	Incurred Losses	Loss Ratio	No. of Risks	Earned Premium	Incurred Losses	Loss Ratio	No. of Risks	Earned Premium	Incurred Losses	Loss Ratio
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1928	4th	22	$44,197	$38,073	86.1%	20	$55,899	$ 45	0.1%	42	$100,096	$38,118	38.1%
1929	4th	25	50,532	1,355	2.7	21	74,811	42,063	56.2	46	125,343	43,418	34.6
1930	4th	19	33,767	18,073	53.5	20	84,935	189,030 (a)	222.6	39	118,702	207,103(a)	174.5
1931	4th	14	23,508	11,603	49.4	21	70,530	81,204(b)	115.1	35	94,038	92,807(b)	98.7
1932	4th	11	14,781	—	—	17	26,904	112	0.4	28	41,685	112	0.3
1933	4th	10	14,047	4,594	32.7	14	20,902	13,343	63.8	24	34,949	17,937	51.3
1934	4th	9	14,148	2,250	15.9	15	26,755	6,006	22.4	24	40,903	8,256	20.2
1935	3rd	9	17,106	11,110	64.9	15	17,934	49,434(c)	275.6	24	35,040	60,544(c)	172.8
1936	2nd	8	18,099	—	—	17	18,546	—	—	25	36,645	—	—
1937	1st	8	18,448	1,781	9.7	17	24,248	4,533	18.7	25	42,696	6,314	14.8
Total		135	248,633	88,839	35.7	177	421,464	385,770	91.5	312	670,097	474,609	70.8

Notes: (a) $181,297 was incurred under one policy.
(b) $ 46,479 was incurred under one policy.
(c) $ 49,434 was incurred under one policy.

EXHIBIT 2

WORKMEN'S COMPENSATION—NEW YORK

EXCESS COVERAGE—PER ACCIDENT BASIS

SUMMARY OF EXPERIENCE FOR POLICY YEARS 1928-1937 INCLUSIVE

Hazard Group	Item	Limit per Accident									Total (3)+(4)+..+(11)
		$500	$5,000	$7,500	$10,000	$15,000	$20,000	$25,000	$50,000	Limits Not Known	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
A	Payrolls	—	185,203	—	40,461,978	3,346,114	338,401	5,101,343	—	—	49,433,039
	Premiums	—	1,852	—	231,588	15,458	225	18,610	—	—	267,733
	Losses	—	14,963	—	358,730	—	—	—	—	—	373,693
B	Payrolls	35,219	1,311,311	20,336,426	37,416,919	5,436,201	9,706,504	334,969	64,837,384	2,000,000	141,414,933
	Premiums	43	6,383	49,543	89,106	5,148	5,887	809	32,103	1,500	190,522
	Losses	—	3,013	18,074	32,384	7	—	—	7,759	—	61,237
C	Payrolls	722,597	5,201,101	37,718,104	78,772,754	6,847,324	—	4,510,273	—	7,529,254	141,301,407
	Premiums	867	10,446	48,913	79,093	6,847	—	2,211	2,200	3,569	154,146
	Losses	962	5,614	12,071	14,486	—	—	—	—	—	33,133
Not Known	Payrolls	—	—	—	241,759	—	—	214,046	—	27,422,854	27,878,659
	Premiums	—	—	—	1,467	—	—	225	—	56,004	57,696
	Losses	—	—	—	—	—	—	—	—	6,546	6,546
Total	Payrolls	757,816	6,697,615	58,054,530	156,893,410	15,629,639	10,044,905	10,160,631	64,837,384	36,952,108	360,028,038
	Premiums	910	18,681	98,456	401,254	27,453	6,112	21,855	34,303	61,073	670,097
	Losses	962	23,590	30,145	405,600	7	—	—	7,759	6,546	474,609

EXHIBIT 3 Sheet 1

REVISION OF RATES FOR EXCESS INSURANCE (PER ACCIDENT BASIS)

Classifications Assigned to Hazard Group A

Code No.	Hazard Group for Present Advisory Rates
Basic Classifications	
1164	A
1330	A
4439	Not Assigned
4440	A
4452	A
4743	A
5000	A
5040	B
5057	B
5059	B
5469	B
5703	A
6209	B
6251	A
6252	A
6257	A
6258	A
7402	C
7405	C
7408	C
7414	Not Assigned
7415	
7416	
7417	
8304	A
9530	A
New York Special Classifications	
5039	B
5068	B
5699	A
5703	A
7710	A
Per Capita Classifications	
9170	Not Assigned
7711	A
(a) Rated Classifications	
4761, 4765, 4766, 4773, 4774	Not Previously Assigned (a) Rated
4779, 4799	Not Assigned (a) Rated
5041	B
5708	A
5709, 6254, 6259, 6260	Not Assigned (a) Rated
6841, 8604, 9529	Not Assigned (a) Rated
Chemical Classifications	
4800-60, 4801-61, 4802-62, 4803-63	Not Assigned
4804-64, 4805-65, 4806-66, 4807-67	Not Assigned
4808-68, 4809-69, 4810-70, 4811-71	Not Assigned

EXHIBIT 3 Sheet

REVISION OF RATES FOR EXCESS INSURANCE (PER ACCIDENT BASIS)

Classifications Assigned to Hazard Group B

Code No.	Hazard Group for Present Advisory Rates	Code No.	Hazard Group for Present Advisory Rates
Basic Classifications		Basic Classifications(cont'd)	
0106	C	4923	B
0251	C	5022	B
1165	B	5160	C
1321	B	5203	B
1421	B	5403	B
1430	C	5462	C
1438	C	5466	B
1624	B	5474	B
1639	B	5506	C (5500D)
1640	B	5507	B (6042D)
1654	B	5508	B (1605)
1710	C	5954	A
1741	B	6003	A
1747	B	6005	A
2014	A	6045	B
2016	A	6202	A
2021	B	6204	B
2216	C	6206	A
2702	B	6217	B
2710	C	6306	B
2960	C	6319	B
3620	C	6701	B
3636	B	6801	B
3642	A	6843	B
3647	B	6864	B
3726	C	6872	B
4034	C	6873	C
4360	B	6874	C
4362	B	7101	B
4400	B	7201	C
4492	B	7309	B
4511	B	7313	B
4536	C	7317	B
4561	B	7403	C
4635	B	7500	B
4670	C	7502	B
4683	C	7538	C
4703	A	7539	C
4730	C	7540	C
4740	B	7570	C

EXHIBIT 3 Sheet 3

REVISION OF RATES FOR EXCESS INSURANCE (PER ACCIDENT BASIS)

Classifications Assigned to Hazard Group B

Code No.	Hazard Group for Present Advisory Rates
Basic Classifications (cont'd)	
7590	C
7601	C
7720	B
7855	C
8204	C
8280	C
9088	C
9180	C
9552	B (9546D)
9553	B (9546D)
9610	B
9630	C
Special New York Classifications	
1604	B
1605	B
2586	B
4000	B
4527	B
5213	B
5538	B
5545	B
5547	B
5698	A
7219	C
8263	C
8265	C (8262D)
9539	C

Code No.	Hazard Group for Present Advisory Rates
(a) Rated Classifications	
2305	Not Assigned
3821	
6010	
6233	C
7224	C
7225	C
7226	C
Chemical Classifications	
4812-72	Not Assigned
4813-73	
4814-74	
4815-75	

EXHIBIT 3 Sheet 4

REVISION OF RATES FOR EXCESS INSURANCE (PER ACCIDENT BASIS)

Classifications Assigned to Hazard Group C

Code No.	Hazard Group for Present Advisory Rates	Code No.	Hazard Group for Present Advisory Rates
Basic Classifications		Basic Classifications (cont'd)	
0001	C	2111	C
0002	C	2112	C
0003	C	2114	C
0005	C	2121	C
0006	C	2130	C
0008	C	2131	C
0035	C	2143	C
0042	C	2150	C
0050	C	2172	C
0301	C	2173	C
0400	C	2174	C
0401	C	2177	C
1452	C	2211	C
1463	C	2220	C
1470	C	2222	C
1472	C	2260	C
1701	C	2280	C
1703	C	2286	C
1745	C	2288	C
1748	C	2291	C
1852	C	2300	C
1860	C	2302	C
1924	C	2303	C
1925	C	2348	C
2001	C	2351	C
2002	C	2352	C
2003	C	2361	C
2030	C	2362	C
2039	C	2380	C
2041	C	2383	C
2042	B	2384	C
2045	C	2386	C
2065	C	2387	C
2070	C	2388	C
2081	C	2402	C
2089	C	2413	B
2095	C	2416	C
2101	C	2417	C
2105	C	2501	C
2110	C	2503	C

EXHIBIT 3 Sheet 5

REVISION OF RATES FOR EXCESS INSURANCE (PER ACCIDENT BASIS)

Classifications Assigned to Hazard Group C

Code No.	Hazard Group for Present Advisory Rates	Code No.	Hazard Group for Present Advisory Rates
Basic Classifications (cont'd)		Basic Classifications (cont'd)	
2531	C	2916	C
2534	C	2920	C
2537	C	2923	C
2538	C	2942	C
2560	C	3002	B
2570	C	3004	C
2571	C	3017	C
2575	C	3018	C
2587	C	3022	C
2600	C	3027	C
2623	C	3028	C
2640	C	3030	C
2651	C	3040	C
2654	C	3041	C
2660	C	3042	C
2670	C	3060	C
2681	C	3064	C
2683	C	3075	C
2686	C	3076	C
2688	C	3081	B
2714	C	3082	C
2731	C	3085	C
2735	C	3089	B
2737	C	3091	C
2741	C	3093	C
2747	C	3110	C
2759	C	3111	C
2763	C	3113	C
2766	C	3114	C
2790	C	3117	C
2791	C	3118	C
2802	C	3119	C
2804	C	3120	C
2835	C	3122	C
2836	C	3126	C
2841	C	3131	C
2881	C	3132	C
2883	C	3145	C
2913	C	3146	C
2915	C	3152	C

EXHIBIT 3 Sheet 6

REVISION OF RATES FOR EXCESS INSURANCE (PER ACCIDENT BASIS)

Classifications Assigned to Hazard Group C

Code No.	Hazard Group for Present Advisory Rates	Code No.	Hazard Group for Present Advisory Rates
Basic Classifications(cont'd)		Basic Classifications(cont'd)	
3169	C	3581	C
3175	C	3612	C
3179	C	3632	C
3180	C	3634	C
3188	C	3635	C
3200	C	3638	C
3220	C	3643	C
3223	C	3648	C
3224	C	3681	C
3227	C	3683	C
3240	C	3685	C
3241	C	3686	C
3255	C	3724	C
3257	C	3803	C
3270	C	3805	C
3300	C	3807	C
3303	C	3808	C
3315	C	3822	C
3331	C	3823	C
3334	C	3824	C
3336	C	3830	C
3364D	C	3841	C
3372	C	3851	C
3373	C	3864	C
3374	C	3865	C
3381	C	3883	C
3382	C	4021	C
3383	C	4024	C
3385	C	4036	C
3400	C	4038	C
3507	C	4053	C
3515	C	4054	C
3516	C	4056	C
3548	C	4061	C
3559	C	4062	C
3561	C	4101	C
3565	C	4102	C
3571	C	4111	C
3574	C	4112	C
3580	C	4113	C

EXHIBIT 3 Sheet 7

REVISION OF RATES FOR EXCESS INSURANCE (PER ACCIDENT BASIS)

Classifications Assigned to Hazard Group C

Code No.	Hazard Group for Present Advisory Rates	Code No.	Hazard Group for Present Advisory Rates
Basic Classifications (cont'd)		Basic Classifications (cont'd)	
4114	C	4503	C
4130	C	4504	C
4131	C	4557	C
4133	C	4558	C
4150	C	4567	C
4206	C	4581	B
4207	C	4583	B
4240	C	4596	C
4243	C	4597	C
4244	C	4627	C
4250	C	4628	C
4251	C	4653	C
4263	C	4665	C
4273	C	4692	C
4279	C	4693	C
4282	C	4710	C
4283	C	4712	C
4299	C	4716	C
4301	C	4717	C
4304	C	4720	C
4307	C	4741	C
4308	C	4902	C
4350	C	4940	C
4351	C	5083D	C
4352	C	5100	C
4361	C	5103	C
4410	C	5183	C
4417	C	5184	C
4418	C	5188	C
4420	C	5190	C
4431	C	5191	C
4432	C	5200	C
4470	C	5342	C
4480	C	5348	C
4482	C	5402	C
4484	C	5443	C
4490	C	5480	C
4491	C	5606	C
4500	B	5610	C
4501	C	5951	C

EXHIBIT 3 Sheet 8

REVISION OF RATES FOR EXCESS INSURANCE (PER ACCIDENT BASIS)

Classifications Assigned to Hazard Group C

Code No.	Hazard Group for Present Advisory Rates	Code No.	Hazard Group for Present Advisory Rates
Basic Classifications (cont'd)		Basic Classifications (cont'd)	
6229	C	8203	C
6325	C	8209	C
6400	C	8215	C
6504	C	8227	C
6824	C	8232	C
7103	C	8233	C
7127	C	8235	C
7128	B	8264	C
7205	C	8266	C
7207	C	8285	C
7360	C	8286	C
7380	C	8291	C
7392	C	8292	C
7515	C	8293	C
7520	C	8295	C
7536	C	8350	C
7580	C	8387	C
7600	C	8391	C
7609	C	8392	C
7610	C	8393	C
7620	C	8601	C
8001	C	8709	C
8006	C	8720	C
8007	C	8726	C
8008	C	8731	C
8013	C	8741	C
8021	C	8742	C
8030	C	8745	C
8031	C	8748	C
8039	C	8750	C
8044	C	8800	C
8050	C	8803	C
8090	C	8810	C
8102	C	8813	C
8103	C	8831	C
8105	C	8833	C
8106	C	8835	C
8107	C	8838	C
8111	C	8840	C
8116	C	8868	C

EXHIBIT 3 Sheet 9

REVISION OF RATES FOR EXCESS INSURANCE (PER ACCIDENT BASIS)

Classifications Assigned to Hazard Group C

Code No.	Hazard Group for Present Advisory Rates
Basic Classifications (cont'd)	
8901	C
9015	C
9016	C
9019	C
9040	C
9052	C
9053	C
9060	C
9061	C
9063	C
9078	C
9079	C
9080	C
9089	C
9090	C
9101	C
9102	C
9154	C
9156	C
9181	C
9182	C
9220	C
9402	C
9403	C
9410	C
9501	C
9505	C
9521	C
9522	C
9545	B
9549	B (9546D)
9585	C
9586	C
9600	C
9620	C
Special New York Classifications	
0034	C
1439	C
1809	C
Special New York Classifications (cont'd)	
1810	C
1853	C
2162	C
2163	C
2164	C
2522	C
2532	C
2552	C
2553	C
2576	C
2578	C
2580	C
2581	C
2582	C
2689	C
3068	C
3113	C
3365	C
3384	C
3548	C
3900	C
4232	C
4239	C
4610	C
5429	C
5491	Not Assigned
5610	C
7998	C
7999	C
8017	C
8018	C
8032	C
8040	C
8043	C
8199	C
8232	C
8385	C
8394	C
9014	C
9015	C

EXHIBIT 3 Sheet 10

REVISION OF RATES FOR EXCESS INSURANCE (PER ACCIDENT BASIS)

Classifications Assigned to Hazard Group C

Code No.	Hazard Group for Present Advisory Rates	Code No.	Hazard Group for Present Advisory Rates
Special New York Classifications (cont'd)		(a) Rated Classifications (cont'd)	
9017	C	3066	Not Assigned
9054	C	3067	
9055	C	3088	
9091	C	3881	
9519	C	4986	
Per Capita Classifications		5550	Not Assigned
0912	C	5705	
0909	C	7227	C
0913	C	8500	Not Assigned
0908	C	9408	
Per Cab Classifications		Chemical Classifications	
7373	C	4816-76	Not Assigned
7374	C	4817-77	
(a) Rated Classifications		4818-78	
0917	Not Assigned	4819-79	
2816		4820-80	
2817		4821-81	Not Assigned
2818		4822-82	
2819		4823-83	

EXHIBIT 4

ANALYSIS OF EXCESS COST OF N. Y. WORKMEN'S COMPENSATION CASES

Policy No.: 8028878	Sheet Number: Cat. 8	Type of Case: Catastrophe	EXCESS LOSSES INCURRED
Claim No.: Cat. 8	Industry Sched. & Group:	Classification: 5040, 5040	Over $10,000: 10,415
Year of Issue: 1934	Hazard Group: A	Kind of Injury: Death, Death	Over $15,000: 6,923
Carrier: 1-28	Age (Widow or Pensioner): 30,46	Losses Inc. Ind.: 20,317 Med.: 25	Over $25,000: 2,900

DETAILS OF CALCULATION

(1)	(2)	(3)	(4)	(5)	(6)	Widow or Widower—Present Value of			
						(7)	(8)	(9)	(10)
Retention Limit	Total Losses Paid or Accrued Incl. Inc. Med. & Reserves for Children in Death Cases	Available Retention (1) — (2)	Annual Wages	Annual Benefit (Widow(er) or Pensioner) Age x = 30,46	No. of Years of Deferred Annuity (3) ÷ (5)	Suspended Benefits (Tab. XV)	All Future Benefits (Table I)	Excess Cost (8) — (7)	Amount of Excess Cost (9)x(4) / 100
$10,000	7,660	2,340	1,500 1,395	450.00 418.50 } 868.50	2.7	79.40 76.88	402.87 475.64	323.47 398.76	10,415
15,000	7,660	7,340	1,500 1,395	450.00 418.50 } 868.50	8.5	189.85 208.43	402.87 475.64	213.02 267.21	6,923
25,000	7,660	17,340	1,500 1,395	450.00 418.50 } 868.50	20.0	302.64 375.53	402.87 475.64	100.23 100.11	2,900

Permanent Tot. Disability Pensioner*—Pres. Value of				Other Cases—Present Value of			Remarks
(11)	(12)	(13)	(14)	(15)	(16)	(17)	
$\overline{N}_{x+(6)}$ **	D_x	Excess Cost (11) ÷ (12)	Amount of Excess Cost (13)x(5)	All Future Benefits (Table XII or XIII)	Amount of Retention (Table XII or XIII)	Excess Cost (15)—(16) x Weekly Benefit	

*Including Permanent Total Disabilities at Reduced Earnings.
**Interpolated.

EXHIBIT 5

ANALYSIS OF EXCESS COST OF N. Y. WORKMEN'S COMPENSATION CASES

Policy No.: 92661	Sheet Number: 2	Type of Case:	EXCESS LOSSES INCURRED
Claim No.: 942531	Industry Sched. & Group:	Classification: 0006	Over $10,000: 11,368
Year of Issue: 1935	Hazard Group: C	Kind of Injury: P. T.	Over $15,000: 8,034
Carrier: 3-37	Age (Widow or Pensioner): 34	Losses Inc. Ind.: 17,133 Med.: 3,500	Over $25,000: 3,494

DETAILS OF CALCULATION

(1)	(2)	(3)	(4)	(5)	(6)	Widow or Widower—Present Value of			
						(7)	(8)	(9)	(10)
Retention Limit	Total Losses Paid or Accrued Incl. Inc. Med. & Reserves for Children in Death Cases	Available Retention (1) — (2)	Annual Wages	Annual Benefit (Widow(er) or Pensioner) Age x = 34	No. of Years of Deferred Annuity (3) ÷ (5)	Suspended Benefits (Tab. XV)	All Future Benefits (Table I)	Excess Cost (8) — (7)	Amount of Excess Cost (9)x(4) / 100
$10,000	4,259	5,741	1,248	832	6.9				
15,000	4,259	10,741	1,248	832	12.9				
25,000	4,259	20,741	1,248	832	24.9				

Permanent Tot. Disability Pensioner*—Pres. Value of				Other Cases—Present Value of			Remarks
(11)	(12)	(13)	(14)	(15)	(16)	(17)	
$\overline{N}_{x+(6)}$ **	D_x	Excess Cost (11) ÷ (12)	Amount of Excess Cost (13)x(5)	All Future Benefits (Table XII or XIII)	Amount of Retention (Table XII or XIII)	Excess Cost (15)—(16) x Weekly Benefit	
372,121.7	27,236.0	13.663	11,368				
262,979.0	27,236.0	9.656	8,034				
114,387.31	27,236.0	4.200	3,494				

*Including Permanent Total Disabilities at Reduced Earnings.
**Interpolated.

EXHIBIT 6

ANALYSIS OF EXCESS COST OF N. Y. WORKMEN'S COMPENSATION CASES

Policy No.: 37298	Sheet Number: 696	Type of Case:	EXCESS LOSSES INCURRED
Claim No.: 924199	Industry Sched. & Group:	Classification: 6306	Over $10,000: 4,372
Year of Issue: 1935	Hazard Group: B	Kind of Injury: Major P. P.	Over $15,000: 2,150
Carrier: 3-37	Age (Widow or Pensioner): 23	Losses Inc. Ind.: 9,461 Med.: 3,500	Over $25,000: 219

DETAILS OF CALCULATION

(1)	(2)	(3)	(4)	(5)	(6)	Widow or Widower—Present Value of			
						(7)	(8)	(9)	(10)
Retention Limit	Total Losses Paid or Accrued Incl. Inc. Med. & Reserves for Children in Death Cases	Available Retention (1) — (2)	Annual Wages	Annual Benefit (Widow(er) or Pensioner) Age x = 23	No. of Years of Deferred Annuity (3) ÷ (5)	Suspended Benefits (Tab. XV)	All Future Benefits (Table I)	Excess Cost (8) — (7)	Amount of Excess Cost (9)x(4) / 100
$10,000	4,132	5,868	1,040	409.30	14.3				
15,000	4,132	10,868	1,040	409.30	26.6				
25,000	4,132	20,868	1,040	409.30	51.0				

Permanent Tot. Disability Pensioner*—Pres. Value of				Other Cases—Present Value of			Remarks
(11)	(12)	(13)	(14)	(15)	(16)	(17)	
$\overline{N}_{x+(6)}$ **	D_x	Excess Cost (11) ÷ (12)	Amount of Excess Cost (13)x(5)	All Future Benefits (Table XII or XIII)	Amount of Retention (Table XII or XIII)	Excess Cost (15)—(16) x Weekly Benefit	
451,952.0	42,311.3	10.682	4,372				
222,266.0	42,311.3	5.253	2,150				
22,593.8	42,311.3	.534	219				

*Including Permanent Total Disabilities at Reduced Earnings.
**Interpolated.

EXHIBIT 7

REVISION OF RATES FOR EXCESS INSURANCE (PER ACCIDENT BASIS)
BASED ON NEW YORK COMPENSATION EXPERIENCE FOR POLICY YEARS 1931-1935 COMBINED

I. SCHEDULE "Z" EXPERIENCE BY HAZARD GROUP

Hazard Group	Payroll in hundreds	Serious Losses			Total Losses		Ratio of Serious to Total (4) ÷ (6)
		No.	Amount	P.P. (4) ÷ (2)	Amount	P.P. (6) ÷ (2)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A—High...	$ 46,629,8	329	$ 1,976,432	$4.24	$ 4,105,004	$8.80	48.2%
B—Medium	886,701,2	2,317	11,926,352	1.35	33,642,189	3.79	35.5
C—Low ...	16,064,416,3	6,629	29,112,090	.18	107,611,471	.67	27.1
Total....	$16,997,747,3	9,275	$43,014,874	.25	$145,358,664	.86	29.6

II. EXCESS PORTION OVER $10,000 PER ACCIDENT

No. of Persons Injured	Group A		Group B		Group C		Total of All Groups	
	No. of Acc.	Amount of Excess	No. of Acc.	Amount of Excess	No. of Acc.	Amount of Excess	No. of Acc.	Amount of Excess
(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
1	101	$344,363	634	$2,140,421	1,531	$4,328,811	2,266	$6,813,595
2	6*	40,919	17*	137,213	16	146,872	39	325,004
3	4	66,594	3*	43,112	4	21,207	11	130,913
4	..	..	2	32,682	..	..	2	32,682
5	..	..	..	..	1	3,714	1	3,714
6	..	..	..	..	1	33,051	1	33,051
7	..	..	1	11,533	1	49,558	2	61,091
8	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..
13	..	..	..	..	1	14,824	1	14,824
Total....	111	$451,876	657	$2,364,961	1,555	$4,598,037	2,323	$7,414,874

III. RATIOS OF EXCESS COST

Hazard Group	Ratio of Excess to Serious			Ratio of Excess to Total		
	Single Cases	Catastrophes	Combined	Single Cases	Catastrophes	Combined
A—High.....	17.4%	5.5%	22.9%	8.4%	2.6%	11.0%
B—Medium....	17.9	1.9	19.8	6.3	0.7	7.0
C—Low.....	14.9	0.9	15.8	4.0	0.3	4.3
Total.....	15.8%	1.4%	17.2%	4.7%	0.4%	5.1%

*One of the catastrophes involves a case which was assigned to a Hazard Group C classification. The proportionate share of excess losses of such catastrophe has therefore been allocated to Group C.

EXHIBIT 8

REVISION OF RATES FOR EXCESS INSURANCE (PER ACCIDENT BASIS)
BASED ON NEW YORK COMPENSATION EXPERIENCE FOR POLICY YEARS 1931-1935 COMBINED

I. SCHEDULE "Z" EXPERIENCE BY HAZARD GROUP

Hazard Group	Payroll in hundreds	Serious Losses			Total Losses		Ratio of Serious to Total (4) ÷ (6)
		No.	Amount	P.P. (4) ÷ (2)	Amount	P.P. (6) ÷ (2)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A—High...	$ 46,629,8	329	$ 1,976,432	$4.24	$ 4,105,004	$8.80	48.2%
B—Medium	886,701,2	2,317	11,926,352	1.35	33,642,189	3.79	35.5
C—Low ...	16,064,416,3	6,629	29,112,090	.18	107,611,471	.67	27.1
Total....	$16,997,747,3	9,275	$43,014,874	.25	$145,358,664	.86	29.6

II. EXCESS PORTION OVER $15,000 PER ACCIDENT

No. of Persons Injured	Group A		Group B		Group C		Total of All Groups	
	No. of Acc.	Amount of Excess	No. of Acc.	Amount of Excess	No. of Acc.	Amount of Excess	No. of Acc.	Amount of Excess
(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
1	95	$186,632	541	$1,229,624	1,278	$2,340,858	1,914	$3,757,114
2	5*	28,057	16*	85,634	15	101,270	36	214,961
3	4	50,388	3*	34,335	4	9,556	11	94,279
4	..	..	1	25,143	..	..	1	25,143
5	..	..	..	..	..	..	..	..
6	..	..	..	..	1	28,051	1	28,051
7	..	..	1	6,533	1	44,558	2	51,091
8	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..
13	..	..	..	..	1	10,349	1	10,349
Total....	104	$265,077	562	$1,381,269	1,300	$2,534,642	1,966	$4,180,988

III. RATIOS OF EXCESS COST

Hazard Group	Ratio of Excess to Serious			Ratio of Excess to Total		
	Single Cases	Catastrophes	Combined	Single Cases	Catastrophes	Combined
A—High.....	9.4%	4.0%	13.4%	4.5%	1.9%	6.4%
B—Medium....	10.3	1.3	11.6	3.7	0.4	4.1
C—Low.....	8.0	0.7	8.7	2.2	0.2	2.4
Total.....	8.7%	1.0%	9.7%	2.6%	0.3%	2.9%

*One of the catastrophes involves a case which was assigned to a Hazard Group C classification. The proportionate share of excess losses of such catastrophe has therefore been allocated to Group C.

EXHIBIT 9

REVISION OF RATES FOR EXCESS INSURANCE (PER ACCIDENT BASIS)
BASED ON NEW YORK COMPENSATION EXPERIENCE FOR POLICY YEARS 1931-1935 COMBINED

I. SCHEDULE "Z" EXPERIENCE BY HAZARD GROUP

Hazard Group	Payroll in hundreds	Serious Losses			Total Losses		Ratio of Serious to Total (4) ÷ (6)
		No.	Amount	P.P. (4) ÷ (2)	Amount	P.P. (6) ÷ (2)*	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A—High...	$ 46,629,8	329	$ 1,976,432	$4.24	$ 4,105,004	$8.80	48.2%
B—Medium	886,701,2	2,317	11,926,352	1.35	33,642,189	3.79	35.5
C—Low ...	16,064,416,3	6,629	29,112,090	.18	107,611,471	.67	27.1
Total....	$16,997,747,3	9,275	$43,014,874	.25	$145,358,664	.86	29.6

II. EXCESS PORTION OVER $25,000 PER ACCIDENT

No. of Persons Injured	Group A		Group B		Group C		Total of All Groups	
	No. of Acc.	Amount of Excess	No. of Acc.	Amount of Excess	No. of Acc.	Amount of Excess	No. of Acc.	Amount of Excess
(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
1	73	$51,658	336	$426,856	721	$768,710	1,130	$1,247,224
2	5*	13,992	12*	38,388	12	52,017	29	104,397
3	4	27,906	2*	21,894	4	1,535	10	51,335
4	..	..	1	16,630	..	..	1	16,630
5	..	..	..	..	..	..	..	..
6	..	..	..	..	1	18,718	1	18,718
7	..	..	1	1,308	1	34,572	2	35,880
8	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..
13	..	..	..	..	1	4,489	1	4,489
Total....	82	$93,556	352	$505,076	740	$880,041	1,174	$1,478,673

III. RATIOS OF EXCESS COST

Hazard Group	Ratio of Excess to Serious			Ratio of Excess to Total		
	Single Cases	Catastrophes	Combined	Single Cases	Catastrophes	Combined
A—High.....	2.6%	2.1%	4.7%	1.3%	1.0%	2.3%
B—Medium....	3.6	0.6	4.2	1.3	0.2	1.5
C—Low.....	2.6	0.4	3.0	0.7	0.1	0.8
Total.....	2.9%	0.5%	3.4%	0.9%	0.1%	1.0%

*One of the catastrophes involves a case which was assigned to a Hazard Group C classification. The proportionate share of excess losses of such catastrophe has therefore been allocated to Group C.

EXHIBIT 10

REVISION OF RATES FOR EXCESS INSURANCE (PER ACCIDENT BASIS)

COMPARISON OF AVERAGE RATES (RATIO OF MANUAL)—PRESENT ADVISORY VS. PROPOSED

Hazard Group	Present Advisory		Indicated		Proposed	Ratios	
	Ratio*: Excess Losses ÷ Total Losses	Rate as Ratio of Manual (2)x .0375 +.0375	Ratio*: Excess Losses ÷ Total Losses	Rate as Ratio of Manual (4)x .9873 +.0123	Rate as Ratio of Manual Calc. as % of Indicated Rate for $10,000 Limit	(6) ÷ (3)	(6) ÷ (5)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$10,000 PER ACCIDENT LIMIT							
					(100%)		
A	.108	.139	.110	.121	.121	87%	100%
B	.070	.103	.070	.081	.081	79	100
C	.038	.073	.043	.055	.055	75	100
$15,000 PER ACCIDENT LIMIT							
					(65%)		
A	75%x .139 =	.104	.064	.075	.079	76%	105%
B	75%x .103 =	.077	.041	.053	.053	69	100
C	75%x .073 =	.055	.024	.036	.036	65	100
$20,000 PER ACCIDENT LIMIT							
					(45%)		
A	50%x .139 =	.070	Not Available		.054	77%	—
B	50%x .103 =	.052	Not Available		.036	69	—
C	50%x .073 =	.037	Not Available		.025	68	—
$25,000 PER ACCIDENT LIMIT							
					(30%)		
A	25%x .139 =	.035	.023	.035	.036	103%	103%
B	25%x .103 =	.026	.015	.027	.024	92	89
C	25%x .073 =	.018	.008	.020	.017	94	85

Note: *In actually calculating excess rates by class, this would be the product of:

$$\frac{\text{Ser. P.P.}}{\text{Total P.P.}} \text{ (for class) x } \frac{\text{Excess Cost}}{\text{Ser. Cost}} \text{ (for hazard group)}$$

EXHIBIT II

WORKMEN'S COMPENSATION—NEW YORK

TEST OF EFFECT OF PROPOSED RATES FOR EXCESS INSURANCE (PER ACCIDENT BASIS) BASED ON EXCESS COVERAGE RISKS IN POLICY YEAR 1937

Risk Number	Code No.	Hazard Group	Payroll	Excess Cover Rate			Excess Cover Premium			Ratios:		
				Actual	Present Advisory* (Based on 7/1/40 Manual Rates)	Proposed* (Based on 7/1/40 Manual Rates)	Actual (4)/100 x(5)	Present Advisory (4)/100 x(6)	Proposed (4)/100 x(7)	Present Advisory ÷ Actual (9) ÷ (8)	Proposed ÷ Actual (10) ÷ (8)	Proposed ÷ Present Advisory (10) ÷ (9)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
$10,000 PER ACCIDENT LIMIT												
1	7309	B	$1,355,788	$.25	$.983(8.0%)	$.750(6.1%)	$3,389	$13,327	$10,168	393.2%	300.0%	76.3%
2	1701	C	9,598	.283	.249(9.5)	.212(8.1)	44MP	44MP	100MP	100.0	227.3	227.3
	8810	C	270	.006	.007(7.0)	.008(7.5)	..	..	..	..	..	..
			9,868				44MP	44MP	100MP	100.0	227.3	227.3
3	4511	B	163,508	.113	.086(9.0)	.091(9.6)	185	141	149	76.2	80.5	105.7
	8810	C	112,678	.006	.007(7.0)	.008(7.5)	7	8	9	114.3	128.6	112.5
			276,186				192	149	158	77.6	82.3	106.0
4	4683	B	905,466	.15	.340(8.0)	.395(9.3)	1,358	3,079	3,577	226.7	263.4	116.2
5	1624	B	117,875	.80	1.192(12.0)	1.112(11.2)	943	1,405	1,311	149.0	139.0	93.3
	4000	B	10,177	.45	1.153(13.0)	.949(10.7)	46	117	97	254.3	210.9	82.9
	1463	C	12,417	.30	.475(10.0)	.352(7.4)	37	59	44	159.5	118.9	74.6
	8742	C	14,295	.02	.045(9.5)	.041(8.7)	3	6	6	200.0	200.0	100.0
	8810	C	6,732	.02	.007(7.0)	.008(7.5)	1	..	1	0.0	100.0	..
			161,496				1,030	1,587	1,459	154.1	141.7	91.9
6	2095	C	1,061,477	.08	.212(7.5)	.170(6.0)	849	2,250	1,805	265.0	212.6	80.2
7	7309	B	420,946	.30	.983(8.0)	.750(6.1)	1,263	4,138	3,157	327.6	250.0	76.3
8	6260	A	527,858	1.30	2.812(14.5)	2.249(11.6)	6,862	14,843	11,872	216.3	173.0	80.0
9	4527	B	891,717	.09	.182(11.0)	.152(9.2)	803	1,623	1,355	202.1	168.7	83.5
10	4720	C	2,514,931	.10	.215(7.5)	.204(7.1)	2,515	5,407	5,130	215.0	204.0	94.9
11	3883	C	182,774	.40	.311(6.5)	.321(6.7)	731	568	587	77.7	80.3	103.3
12	1421	B	1,009,998	.09	.623(9.5)	.630(9.6)	909	6,292	6,363	692.2	700.0	101.1
13	4720	C	518,420	.05	.215(7.5)	.204(7.1)	259	1,115	1,058	430.5	408.5	94.9

*Disregarding any discount for upper limit on carrier's liability.

EXHIBIT 11 (Continued)

WORKMEN'S COMPENSATION—NEW YORK

TEST OF EFFECT OF PROPOSED RATES FOR EXCESS INSURANCE (PER ACCIDENT BASIS)
BASED ON EXCESS COVERAGE RISKS IN POLICY YEAR 1937

Risk Number	Code No.	Hazard Group	Payroll	Excess Cover Rate			Excess Cover Premium			Ratios:		
				Actual	Present Advisory* (Based on 7/1/40 Manual Rates)	Proposed* (Based on 7/1/40 Manual Rates)	Actual (4)/100 x(5)	Present Advisory (4)/100 x(6)	Proposed (4)/100 x(7)	Present Advisory ÷ Actual (9) ÷ (8)	Proposed ÷ Actual (10) ÷ (8)	Proposed ÷ Present Advisory (10) ÷ (9)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
$10,000 PER ACCIDENT LIMIT (Continued)												
14	8810	C	$1,116,023	$.02	$.007(7.0)	$.008(7.5)	250MP	250MP	100MP	100.0%	35.6%	40.0%
15	7309	B	393,987	1.00	.983(8.0)	.750(6.1)	3,940	3,873	2,955	98.3	75.0	76.3
(a) Sub-Total			$11,346,935				$24,394	$58,545	$49,844	240.0%	204.3%	85.1%
$20,000 PER ACCIDENT LIMIT												
(b) 16	7309	B	$1,629,425	.05	$.492(4.0)	$.332(2.7)	815	8,017	5,410	983.7	663.8	67.5
(c) Total (a)+(b)			$12,976,360				$25,209	$66,562	$55,254	264.0%	219.2%	83.0%
EXCLUDED RISKS												
17	2003	C	$3,606,693	$.15			$5,410			($ 7,500 limit)		
18	7317	B	1,901,830	.16			3,043			($ 7,500 limit)		
	8810	C	212,455	.02			42			($ 7,500 limit)		
19	—		—				500			($10,000 limit)		
20	—		2,643,079				1,189					
21	—		1,564,614				3,520					
22	—		2,563,321				1,794					
23	—		310,253				233					
24	—		805,922				747					
25	—		1,601,328				1,009					
(d) Sub-Total			$15,209,495				$17,487					
(e) GRAND TOTAL (c)+(d)			$28,185,855				$42,696					

*Disregarding any discount for upper limit on carrier's liability.

EX-MEDICAL COVERAGE—WORKMEN'S COMPENSATION

BY

STEFAN PETERS

INTRODUCTION*

A workmen's compensation risk written on an ex-medical basis is a risk for which the employer obligates himself to assume the liability for medical payments to injured employees and to save the insurance carrier harmless therefrom, by means of a specific endorsement attached to the workmen's compensation insurance policy. Such risks shall be called in this paper briefly ex-medical risks.

Before entering in detail upon the different aspects of ex-medical coverage, some of the advantages and disadvantages of this form of coverage will be briefly discussed.

Ex-medical coverage is usually taken either by hospitals or by risks having plant hospitals of their own. Often these risks are equipped to treat employees in case of disease or injury, whether due to accident or not, and the medical care for workmen injured in the course of employment adds relatively little work to the normal medical care afforded and can therefore be given at reduced cost for the employer. Advantages of ex-medical coverage to such risks are:

(a) Some of the larger risks find themselves in a location where medical aid and hospital care is not easily available and are therefore forced to maintain plant hospitals for their employees. Injured workmen availing themselves of these hospitals save the trouble of traveling over long distances when injured.

(b) Insured hospitals or employers maintaining hospitals often are able and willing to supply a greater amount of medical care and use more elaborate equipment than an injured employee is normally able to obtain. The better medical care is provided either for humanitarian reasons or as a matter of professional pride or simply with the aim of maintaining the efficiency of the employee.

(c) The employee and his medical history are known to the plant physician.

(d) Lower cost to the employer.

* The author is indebted to Mr. James M. Cahill for having suggested that he investigate many of the problems dealt with in this paper. He is, however, solely responsible for the conclusions drawn.

Against ex-medical coverage the following arguments can be brought forth:

(a) The employer enters into the private life of the employee.
(b) The employer can eventually bring pressure on an employee to content himself with inferior medical care or to resume work before he is thoroughly recovered. He might also, without intention, create fear in the employee that his position may be endangered if he does not limit the demand for the medical care afforded him.

In New York, these two arguments are, however, weakened by the fact that according to Section 13(a) of the Workmen's Compensation Law, the employee has a free choice of the physician and hospital by whom he wants to be treated, and would consequently in some cases find no difficulty in electing not to be treated in the hospital of his employer.

Under normal circumstances the granting of ex-medical coverage to risks of the above described category seems therefore to be justified by the particular nature of these risks.

Ex-medical coverage is permitted in the following states:

Alabama	Iowa	Nebraska
Arizona	Kansas	New Mexico
California	Kentucky	New York
Colorado	Louisiana	North Carolina
Connecticut	Maryland	Rhode Island
Florida	Michigan	South Carolina
Idaho	Minnesota	South Dakota
Illinois	Missouri	Vermont
Indiana	Montana	

States in which workmen's compensation is insured by a monopolistic state fund have not been taken into consideration in this list.

The choice of a statutory or ex-medical coverage policy is optional with the employer, except that hospitals are often forced by underwriters to take ex-medical coverage in order to protect the carrier against excessive medical claims. The choice of ex-medical coverage, if written in New York, is subject to the approval of the Compensation Insurance Rating Board which has issued certain rules stating the qualifications to be met by a risk

desiring ex-medical coverage. Such rules were first promulgated by the Board in Bulletin R. C. 233, dated May 2, 1918, and have since remained substantially unchanged. The qualifications which at present must be met in New York may be quoted from the New York Manual:

"(a) Dispensary or Emergency Hospital. A suitably equipped dispensary or emergency hospital shall be maintained. A physician or a nurse who is either a graduate nurse or has had two years experience in surgical nursing shall be employed at the plant and shall be available at all times during working hours. The duties of such physician or nurse, except when called for the purposes of rendering medical or surgical attention, shall not necessitate his presence elsewhere than in the dispensary.

(b) Arrangements with Physician. Where a nurse is employed but no physician is in constant attendance, the assured shall maintain permanent arrangements with a physician who shall visit the plant not less frequently than three times a week and who shall be available on call at all times. Such physician shall supervise and direct the first aid work.

(c) Arrangements with Hospital. Permanent arrangements for necessary medical and surgical service shall be made with a hospital not more than a half-mile distant from the plant unless an emergency hospital is available on the assured's premises."

Similar conditions apply in most other states in which ex-medical coverage is permitted. Ex-medical coverage is chiefly desired by risks of considerable size, since small risks usually cannot meet the qualifications. There are, however, some notable exceptions: Small hospitals and private clinics often take ex-medical coverage.

The extent to which use has been made of this form of coverage in the State of New York is shown by the following table:

TABLE I

WORKMEN'S COMPENSATION — NEW YORK

Policy Year	Ex-Medical		TOTAL Ex-Medical and Statutory		Ratio Ex-Medical ÷ Total	
	Payrolls	Premiums Exclusive of Constants	Payrolls	Premiums Exclusive of Constants	(2) ÷ (4)	(3) ÷ (5)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1934	$105,644,401	$ 899,985	$3,308,863,806	$44,204,228	3.2%	2.0%
1935	113,850,812	1,362,189	3,567,692,362	57,506,563	3.2	2.4
1936	137,153,236	1,762,540	4,029,171,639	70,177,547	3.4	2.5
1937	129,948,269	2,280,091	4,150,812,062	72,912,512	3.1	3.1
1938	121,051,871	2,620,273	4,186,556,474	74,373,020	2.9	3.5

The standard workmen's compensation insurance policy provides that the insurance carrier takes over the liability of the employer under the state workmen's compensation and employer's liability laws for compensation and medical claims of injured employees and agrees to furnish all services required in connection with this liability. If an employer is covered on an ex-medical basis an endorsement is attached to the policy in which it is stated that the employer will comply with all requirements of the law regarding the medical treatment of injured employees and will save the insurance carrier harmless from any medical claims which might be made against it.

In New York, since August 1, 1928, the following standard endorsement has been attached to policies written on an ex-medical basis:

STATUTORY MEDICAL AID ENDORSEMENT

For attachment to Policy No.....

In consideration of the reduced premium rates for which this policy is issued in connection with operations at or from ----------, it is agreed as follows:
(give location)

This Employer will undertake and comply with all the requirements of Section 13 of the Workmen's Compensation Law respecting medical, surgical or other attendance or treatment, nurse and hospital service, medicine, crutches or apparatus, and will save the Company harmless therefrom.

This Employer agrees that he will maintain upon the premises above described either a dispensary or an emergency hospital during the entire period of the policy and will therein render the medical or surgical service, attendance or appliances prescribed by the Company in conformity with rules of the Workmen's Compensation Rate Manual applicable thereto.

In the event of the insolvency or bankruptcy of this Employer, which necessarily and unavoidably prevents him from complying with the provisions of this endorsement, all expenses incurred by the Company under Section 13 shall become the immediate obligation of this Employer and shall constitute a valid and incontestable claim against his insolvent or bankrupt estate.

As appears from the last paragraph of this endorsement, the carriers assume voluntarily the liability for medical claims arising

from coverage of ex-medical risks in the case of insolvency or bankruptcy of the employer, with the provision, however, that their payments shall constitute a valid and incontestable claim against the bankrupt estate. This paragraph has been included in the Statutory Medical Aid Endorsement upon a suggestion made by the New York Insurance Department in order to give injured employees fuller protection.

The first rules dealing with ex-medical coverage in New York appeared in the Manual of June 30, 1916. These rules, which were subsequently several times amended, present today a merely historical interest and may therefore be omitted from this paper.

In the Manual which became effective on December 31, 1920 a procedure for the derivation of ex-medical rates was established based on principles similar to those of the procedure used at present. The rule reads as follows:

> "Rates for policies excluding Statutory Medical Aid shall be calculated by the Board in accordance with the following rule:
>
> Determine the percentage reduction for each risk by comparing 80% of the medical portion of the manual rate for the governing classification with the total manual rate for the classification.
>
> In determining rates for any risk, the manual rates adjusted by schedule and/or experience rating less the percentage reduction as above indicated shall be considered as the final rates for the risk."

A similar procedure was adopted by the National Council on Compensation Insurance.

On August 1, 1928 the revised standard form of the Statutory Medical Aid Endorsement quoted above was adopted. This endorsement does not abrogate the obligation of the carrier to service and administer medical claims. It has been the practice of insurance carriers in New York and in other states to afford full claim service for medical claims arising from the coverage of risks written on an ex-medical basis. This service is, however, subject, in New York, to certain restrictions imposed by the Workmen's Compensation Law, which provides, in Section 13j, that an insurance carrier shall not participate in the treatment of injured workmen, except that it may employ medical inspectors

and that it may maintain rehabilitation bureaus. In order to recognize the fact that full claim service for medical claims is rendered by the carriers even if the policy is written on an ex-medical basis and also that administrative expenses are not reduced, the method of determining ex-medical rates was amended at a meeting of the Actuarial Committee of the National Council on Compensation Insurance held on November 5, 1926. The relative section of the minutes of the Committee may be quoted in part:

> "At present ex-medical rates are determined by deducting 80% of the medical rate from the full manual rate. Accordingly, only 20% of the medical rate remains to cover the above listed items.(1) The Committee felt that this 20% was entirely inadequate to meet the needs. After due consideration the following resolution was adopted:
>
> *Resolved*: That effective concurrently with the next general revision of rates in each state, the ex-medical rates be determined by deducting 60% of the medical rate from the total manual rate."

In accordance with this resolution a corresponding procedure was adopted in New York effective October 1, 1927.

The Determination of Rates for Ex-Medical Risks

Previous Method

It was mentioned in the introduction that previous to the adoption of the present method of calculating rates for ex-medical risks, these rates were determined by subtracting from the manual rate 80% of the medical portion of the manual rate:

(1a) ex-medical rate = manual rate $-$ .80 $\times$ medical rate

or

$$\text{(1b) ex-medical discount} = 1 - \frac{\text{ex-medical rate} - \text{cat.}}{\text{manual rate} - \text{cat.}}$$

$$= \frac{.80 \times \text{medical rate}}{\text{manual rate} - \text{cat.}}$$

$$= .80 \ \frac{\text{medical pure premium}}{\text{total pure premium}}$$

The theory underlying this method was that the ex-medical pure

(1) This refers to certain points formulated by the Committee which are quoted later in this paper. In particular see point (3) on page 120.

premium was to be considered equal to the total pure premium less 80% of the medical pure premium and that the expense loading for ex-medical risks was the same, percentagewise, as that for risks written on a statutory basis. Since, on November 5, 1926, this method was abandoned in favor of the present method of calculation of ex-medical rates, the underlying assumptions will be analyzed when discussing the present method.

Present Method

In the introduction it was mentioned that the Actuarial Committee of the National Council on Compensation Insurance decided on November 5, 1926 to adopt an ex-medical rate according to the formula

(2a) ex-medical rate = manual rate $-$ .60 $\times$ medical rate

or a corresponding ex-medical discount of

$$\text{(2b) ex-medical discount} = .60 \times \frac{\text{medical pure premium}}{\text{total pure premium}}$$

The motive for this change, as expressed in the resolution, was the desire to give recognition to the fact that not all expense items for ex-medical risks are reduced in the same proportion as the pure premium. There is no indication in the minutes of the Actuarial Committee of the National Council of the detailed considerations or calculations which must have led to the present formula for the ex-medical discount. However, from the provisions relating to ex-medical risks which, at a later date, have been incorporated in the Experience Rating Plan and in part also from the provisions governing ex-medical risks under the Retrospective Rating Plan it can be inferred that the new formula for the ex-medical discount is based on the following fundamental assumptions:

Assumption A:

The ex-medical pure premium is equal to the total pure premium less 80% of the medical pure premium.

Assumption B:

Expenses, except for acquisition and taxes, are not reduced by exclusion of medical coverage. The acquisition and tax expenses, being a fixed percentage of the final premium, are reduced in proportion to the latter.

These two assumptions lead to the following derivation of the ex-medical rate:

$$(1 - \text{acq.} - \text{tax.}) \times (\text{ex-medical rate} - \text{cat.}) = (1 - \text{acq.} - \text{tax.}) \times (\text{manual rate} - \text{cat.}) - .80 \times \text{medical p.p.}$$

hence

$$\text{(3a)}\quad \text{ex-medical rate} = \text{manual rate} - \frac{.80}{1 - \text{acq.} - \text{tax.}} \times \text{medical p.p.}$$

$$\text{ex-medical discount} = \frac{.80}{1 - \text{acq.} - \text{tax.}} \times \frac{\text{medical p.p.}}{\text{manual rate} - \text{cat.}}$$

$$\text{(3b)}\qquad , \quad = \frac{.80 \times \text{permissible loss ratio}}{1 - \text{acq.} - \text{tax.}} \times \frac{\text{medical p.p.}}{\text{total p.p.}}$$

Assuming an average provision of .025 for taxes, .175 for acquisition and an average permissible loss ratio of .600, this leads to

$$\text{(4a)}\quad \text{ex-medical rate} = \text{manual rate} - \text{medical pure premium}$$

$$\text{(4b)}\quad \text{ex-medical discount} = \frac{\text{medical p.p.}}{\text{manual rate} - \text{cat.}} = .60 \times \frac{\text{medical p.p.}}{\text{total p.p.}}$$

These are the formulas which are in use at present in New York and all other states except California. In California the ex-medical discount is determined according to the formula:

$$\text{ex-medical discount} = \frac{.80 \times \text{medical rate}}{\text{manual rate} - \text{cat.}}$$

It appears from the derivation given that, on the basis of Assumptions A and B mentioned before, the present formula for the ex-medical discount is only approximately correct. It is, so to say, an average formula, uniformly applied in almost all states which permit ex-medical coverage. If an exact agreement with Assumptions A and B were desired the formula would have to be corrected in each state in accordance with the different compositions of manual rates. Numerical examples may be given for New York and for Connecticut and many other states in which manual rates have the same structure as in Connecticut. Since in the course of this paper several other numerical examples will be based on the manual rate formulas for these states, it will be good to give, for the convenience of the reader, a comparative table of

the expense items entering into the structure of manual rates in New York and Connecticut:

TABLE II

Item	Connecticut	New York
Acquisition	.175	.150
Taxes	.025	.035
Claim Adjustment	.083	.080
Ind. Comm. & Social Security Tax	..	.024
Inspection	.026	.025
H. O. Administration	.057	.071
Payroll Audit	.009	.017
Total Expense	.375	.402
Permissible Loss Ratio	.625	.598

Substituting in formula (3b) the numerical values shown in Table II, it appears that the correct value for the ex-medical discount in New York would be

$$.587 \times \frac{\text{medical p.p.}}{\text{total p.p.}}$$

which is about 2% smaller than the discount according to the present formula, and in Connecticut

$$.625 \times \frac{\text{medical p.p.}}{\text{total p.p.}}$$

or about 4% more than according to the present formula.

Assumptions A and B preceding may now be examined in order to determine to what extent they are backed by experience. In this examination the following points may be discussed which were formulated by the Actuarial Committee of the National Council on Compensation Insurance on November 5, 1926 as points involved in any consideration of the ex-medical allowance:

(1) A selection against the insurance carriers.
(2) Payment of some medical even though the policy is written ex-medical.
(3) A major portion of the expense is not reduced by the exclusion of medical.

To these points the following may be added:

(4) Obligation of the insurance carrier to pay medical losses if the employer is unable or refuses to do so.

Points (1), (2) and (4) are related to Assumption A. Point (3) expresses the principle underlying Assumption B.

While it is possible that risks choosing ex-medical coverage may

have a medical loss ratio lower than average, it cannot be maintained that their insurance on an ex-medical basis leads to a selection against the carriers. As a matter of fact, medical pure premiums are based only on the experience of risks with statutory medical coverage and reflect, therefore, any increase of the overall medical loss ratio which may result from the coverage of a group of risks with under-average medical loss ratio on an ex-medical basis. Only in times of a rapid increase in the proportion of risks covered on an ex-medical basis the increase in medical pure premiums which are based on past experience may be insufficient to compensate the entire effect of an eventual increase in the overall medical loss ratio. This may have been the situation at the end of 1926 when point (1) above was formulated but, at present, the proportion of ex-medical risks is fairly steady as illustrated by Table I, based on New York experience. Therefore, any existing increase in the overall medical loss ratio due to ex-medical coverage is compensated by a corresponding increase in medical rates. This point must hence be ruled out as a justification for the retention of 20% of the medical pure premium in ex-medical pure premiums as formulated in Assumption A.

In so far as experience for New York indicates, the second argument in favor of Assumption A, namely that some medical is paid even though the policy is written on an ex-medical basis, cannot have much weight either. Indeed, from Table III below it appears that the amounts of medical paid for ex-medical risks are negligible and do not justify the retention of any substantial part of the medical pure premium for ex-medical coverage. Since the New York Workmen's Compensation Law provides no limit for medical benefits, it is likely that the indication of the experience for New York applies *a fortiori* in states with less liberal medical benefits.

TABLE III

WORKMEN'S COMPENSATION — NEW YORK

Policy Year	Premiums Excluding Constants		Medical Losses		Ratios		
	Statutory Coverage	Ex-Medical Coverage	Statutory Coverage	Ex-Medical Coverage	(4) ÷ (2)	(5) ÷ (3)	(7) ÷ (6)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1937	$70,632,421	$2,280,091	$11,954,222	$4,235	16.92%	.186%	1.1%
1938	71,752,747	2,620,273	12,282,459	1,706	17.12	.065	.4

In my opinion, therefore, the only remaining argument in favor of the retention of a part of the medical pure premium in ex-medical rates is the contractual liability of the carrier to supply medical aid if the employer does not live up to his obligations. This event will chiefly take place in case of bankruptcy of the employer. Recently the question has been raised whether the insurance carrier is also liable to provide medical benefits if the employer refuses to pay a medical bill or to submit it for arbitration. Although it is likely that no such obligation exists, no absolute certainty on this point has yet been reached and it may be that carriers can incur or may assume some liability in these circumstances. No experience is available regarding the frequency and the extent of the type of liability for medical losses just described, but it can safely be estimated that a provision of 5% of the medical pure premium will amply take care of this contingency.

For this reason I propose that Assumption A underlying the determination of ex-medical rates and discounts be replaced by

Assumption C:

> The ex-medical pure premium is equal to the total pure premium less 95% of the medical pure premium.

With respect to Assumption B, it is evident that the amount of expenses for inspection, payroll audit and home office administration will be about equal for risks insured on statutory or ex-medical bases. Acquisition and taxes, being a fixed percentage of the final premium, will be reduced in the same proportion as the manual rate. The only expense items which need more detailed consideration are the expense provisions for industrial commissions, labor departments, insurance departments or similar institutions and claim adjustment.

Where the expense for the Industrial Commission or similar institution is levied in proportion to indemnity losses (as is the case in New York), it is evident that the amount of this expense is the same whether medical coverage is afforded or not. If instead this expense were levied on premiums, it should be reduced for ex-medical risks in the proportion of the ex-medical to the manual rate and therefore be considered and treated as an additional tax expense.

Claim adjustment has been considered in the present formula for ex-medical rates, in the Experience Rating Plan and in the Retrospective Rating Plan as an expense item which is not reduced by the exclusion of medical liability. The reason for this procedure is to be found in the fact, already discussed in the introduction, that insurance carriers have always rendered to ex-medical risks full claim service for all claims including medical. It may, however, be questioned whether the cost of servicing medical claims incurred by ex-medical risks is actually as high as that for risks with statutory coverage, since the carriers save some clerical and telephone expense connected with the payment and control of medical bills and since also investigations of physicians are reduced in number or entirely eliminated.[2]

In view of the foregoing consideration it is likely that the claim adjustment expense is somewhat reduced by exclusion of medical liability. Lacking some more detailed experience regarding this point, however, the amount of this reduction cannot be stated with certainty. A rough estimate would be that claim adjustment expense for medical claims incurred by ex-medical risks runs about 10% lower than the corresponding expense for risks written on a statutory basis. It is proposed that the full claim expense provision be retained in ex-medical rates until specific experience regarding the cost of claim service for ex-medical risks has become available.

Summarizing the preceding considerations about the effect of the exclusion of medical liability on the various expense provisions in compensation rates, it seems that Assumption B underlying the derivation of the present formula for ex-medical rates reflects the actual conditions, provided that in those states in which a specific charge for the expenses of an industrial commission or similar institution is levied in proportion to premiums such expense item should be included in the provision for taxes. If, in the future, a specific study should reveal that claim expense for ex-medical risks is reduced, say, from the proportion c of the manual rates (normally .080) to the proportion c', Assumption B should be replaced by

(2) For the information regarding a reduction in the medical claim adjustment expense for ex-medical risks, I am indebted to Mr. S. L. Hanson.

Assumption D:

Expenses, except for claim adjustment, acquisition and taxes are not reduced by the exclusion of medical liability. Claim adjustment is reduced to the proportion c' of the manual rate. Acquisition and taxes being a fixed percentage of the final premium, are reduced in proportion to the latter.

The revised formula for ex-medical rates and discounts derived on the basis of Assumptions C and B are the following:

$$\text{(5a) ex-medical rate} = \text{manual rate} - \frac{.95}{1 - \text{acq.} - \text{tax.}} \times \text{med.p.p.}$$

$$\text{(5b) ex-medical discount} = \frac{.95}{1 - \text{acq.} - \text{tax.}} \times \frac{\text{medical p.p.}}{\text{manual rate} - \text{cat.}}$$

$$= \frac{.95 \times \text{perm. l. r.}}{1 - \text{acq.} - \text{tax.}} \times \frac{\text{medical p.p}}{\text{total p.p.}}$$

If instead of Assumptions C and B, Assumptions C and D were adopted, the formulas would have to be modified in the following manner:

$$\text{(6a) ex-medical rate} = \text{manual rate} \left(1 - \frac{c - c'}{1 - \text{acq.} - \text{tax.}}\right) - \frac{.95 \times \text{med. p.p.}}{1 - \text{acq.} - \text{tax.}}$$

$$\text{(6b) ex-medical discount} = \frac{c - c'}{1 - \text{acq.} - \text{tax.}} + \frac{.95 \times \text{perm. l. r.}}{1 - \text{acq.} - \text{tax.}} \times \frac{\text{medical p.p.}}{\text{total p.p.}}$$

In order to give an idea of the effect of the proposed changes, the numerical values of the ex-medical discount computed on the present basis and on the basis of Assumptions B and C or D and C are given in the following table. For the application of formula (6b) the assumption is made that claim adjustment for ex-medical risks is reduced to .065 of the statutory premium in both states.

TABLE IV

	Connecticut	New York
Present Formula	$\frac{.60 \times \text{med. p.p.}}{\text{total p.p.}}$	$\frac{.60 \times \text{med. p.p.}}{\text{total p.p.}}$
Assumptions B and C — Formula (5b)	$\frac{.742 \text{ med. p. p.}}{\text{total p.p.}}$	$\frac{.697 \text{ med. p.p.}}{\text{total p.p.}}$
Assumptions D and C — Formula (6b)	$.023 + \frac{.742 \text{ med. p.p.}}{\text{total p.p.}}$	$.018 + \frac{.697 \text{ med. p.p.}}{\text{total p.p.}}$

Both the proposed decrease of the portion of the medical pure premium to be retained for ex-medical risks and the proposed decrease in the provision for claim adjustment (if justified by the results of some future study) tend to increase the ex-medical discount and, consequently, to decrease the rates to be charged for ex-medical coverage.

The Treatment of Ex-Medical Risks Under the Experience Rating Plan

Under the Experience Rating Plan a weighted average of the actual and expected losses of a risk for the experience period is compared with the expected losses; the ratio is the experience modification which is applied to the manual or schedule rates to determine the adjusted rates for the ensuing year. It is evident that for ex-medical risks whose actual losses do not include any medical losses or but a very small amount of such losses, the expected losses must be determined in such a manner as to exclude likewise all or almost all expected medical losses. This principle was indeed followed in setting up the rules governing the treatment of ex-medical risks under the Experience Rating Plan by making the expected ex-medical losses equal to payrolls extended at ex-medical pure premiums.

During the period in which the ex-medical discount was equal to

$$\frac{\text{.80 medical pure premium}}{\text{total pure premium}}$$

the unweighted subject premium was determined by extending the payrolls of each classification by the latest ex-medical rates and expected losses were obtained by multiplying the subject premium with the permissible loss ratio. In formulas:

ex-medical expected losses =

$$\text{payroll} \times \text{manual rate} \times \left(1 - \frac{\text{.80 med. p.p.}}{\text{total p.p.}}\right) \times \text{permissible loss ratio}$$

$$= \text{payroll} \times \text{total pure premium} \times \left(1 - \frac{\text{.80 med. p.p.}}{\text{total p.p.}}\right)$$

$$= \text{payroll} \times (\text{total pure premium} - \text{.80 med. pure prem.})$$

and this is, following Assumption A,

$$= \text{payroll} \times \text{ex-medical pure premium}$$

as it should be.

Shortly after the adoption on November 5, 1926 of an ex-medical discount equal to $\frac{.60 \text{ medical pure premium}}{\text{total pure premium}}$,

namely on July 15, 1927, the Actuarial Committee of the National Council on Compensation Insurance adopted the following resolution:

> *Resolved:* That for experience rating purposes 20% of the medical pure premium be retained in determining expected losses instead of the 40% retained in establishing ex-medical ratios.

In accordance with this resolution, the following rule has been inserted in the Experience Rating Plan:

> "For that part of the experience period during which the risk has been insured without medical, the premium subject to experience rating shall be reduced by an amount equal to the subject premium times 1.33 times the ex-medical ratio shown on the rate sheet for each classification."(3)

The factor 1.33 is obviously the ratio .80 ÷ .60. For the determination of the ex-medical expected losses the statutory expected losses are therefore reduced by a discount of

$$1.33 \times \frac{.60 \text{ med. p.p.}}{\text{total p.p.}} = \frac{.80 \text{ med. p.p.}}{\text{total p.p.}}$$

as before. Since statutory expected losses are equal to the payrolls extended at total pure premiums, this reduction has the effect of making ex-medical expected losses equal to payrolls extended at ex-medical pure premiums.(4) From this derivation it can be seen that Assumptions A and B have been used also in establishing the rules governing ex-medical risks under the Experience Rating Plan.

When discussing the present method of establishing ex-medical rates, it was shown that the present formula for the ex-medical discount is only approximately correct and that the correct for-

(3) Quoted from rule 13 of the New York Experience Rating Plan effective October 5, 1930.

(4) In New York the subject premium is really not multiplied by .598 but by .598 × 1.012 = .605. The factor 1.012 represents a charge for the Security Funds which is divided into the payroll projection factors. The product of .605 and the modified subject premium does therefore not include the Security Fund factor which is also omitted from the modified actual losses with which the modified expected losses are to be compared.

mula would be formula (3b). If, therefore, this formula were adopted, the subject premium for ex-medical risks would have to be reduced by the ex-medical discount multiplied by the ratio

$$(7) \qquad \frac{1 - \text{acq.} - \text{tax.}}{\text{permissible loss ratio}},$$

in order to arrive at the correct expected ex-medical losses in agreement with Assumption A. This ratio would amount to 1.36 for New York and 1.28 for Connecticut as compared with 1.33 in the present plan.

The same formula (7) would apply if the ex-medical discount were calculated according to proposed formula (5b) which was based on Assumption C, that is, on the assumption of an ex-medical pure premium equal to the total pure premium less 95% of the medical pure premium. Indeed, in this case we would have:

$$\begin{aligned}
&\text{expected ex-medical losses} = \\
&\text{payroll} \times \text{manual rate} \times \text{permissible l. r.} \\
&\times \left(1 - \frac{1 - \text{acq.} - \text{tax.}}{\text{permissible l. r.}} \times \frac{.95 \times \text{permissible l. r.}}{1 - \text{acq.} - \text{tax.}} \times \frac{\text{med. p.p.}}{\text{total p.p.}}\right) \\
&= \text{payroll} \times \text{total pure premium} \times \left(1 - .95 \times \frac{\text{med. p.p.}}{\text{total p.p.}}\right) \\
&= \text{payroll} \times (\text{total p.p.} - .95 \text{ med. p.p.}) \\
&= \text{payroll} \times \text{ex-medical pure premium}
\end{aligned}$$

If at some later date Assumption D should be adopted instead of Assumption B, that is, if some reduction of claim adjustment should be taken into consideration in establishing ex-medical rates, formula (7) would have to be replaced by a slightly more complicated formula which is omitted from this paper, since at present it would have only limited interest.

The split of expected ex-medical losses into a normal and excess portion is made in the following manner: First the statutory excess subject premium is determined in the customary way by extending payrolls at manual rates and applying to these premiums the average excess ratio. Then, the ex-medical reduction of the subject premium is computed by multiplying the statutory subject premium by 1.33 $\times$ the ex-medical discount. Finally this ex-medical reduction is multiplied by the medical excess ratio and subtracted from the statutory excess subject premium. The result is the ex-medical excess subject premium which, multiplied by the

permissible loss ratio, furnishes the expected ex-medical excess losses.[5] Since the ex-medical reduction of the subject premium represents medical losses which are excluded for ex-medical risks, it was necessary to apply to this reduction the medical excess ratio in order to arrive at the correct ex-medical excess subject premium. The expected ex-medical normal losses are the difference between the total expected ex-medical losses and the expected ex-medical excess losses. This procedure appears to be appropriate except for a possible correction of the factor 1.33 which was previously discussed.

Ex-Medical Risks Under the Retrospective Rating Plan

In order to explain more easily the provisions of the Retrospective Rating Plan relating to ex-medical risks, it will be advisable to mention briefly some of the more essential sections of the Plan dealing with its technical set-up. The introduction of the Plan may therefore be quoted:

> "Retrospective Rating is a plan or method which permits adjustment of the final premium for a risk, variable between a specific Minimum and Maximum percentage of the Standard Premium for such risk, on the basis of its own developed loss experience.
>
> The rating formula is as follows:
>
> (a) A specified percentage of the Standard Premium is charged to provide for expenses that are independent of the loss ratio and to cover any losses in excess of those contemplated by the Maximum Retrospective Premium. The percentage of the Standard Premium is designated the "Basic Premium."
>
> (b) The losses incurred by the risk, increased for claim expense and taxes not provided for in (a), are added to the Basic Premium.
>
> (c) The total of these items is the Retrospective Premium to be charged, subject to limitation by specified Minimum and Maximum Retrospective Premiums."

From (a) it can be seen that the basic premium includes provisions for home office administration, payroll audit and inspection; in New York, also for the expenses of the Department of Labor and for Social Security Act taxes. For risks under the Retrospec-

(5) See note (4).

tive Rating Plan acquisition is based on the minimum premium. The provision for acquisition is, therefore, independent of the loss ratio and hence is included in the basic premium. Another element in the basic premium is the insurance charge, which is a net premium for the coverage of any amount of loss in excess of the loss provision in the maximum premium (as stated in (a) above), but reduced for the excess loss provision in the retrospective premium for those risks to which the minimum premium applies. In California and New York, the insurance charge is slightly increased to cover also losses in excess of $10,000 per claim (see below). The claim adjustment on the insurance charge is also included in the basic premium, as is the amount of taxes to be paid on the basic premium portion of the retrospective premium.

The amount mentioned in (b) above is obtained by multiplying actual incurred losses by the loss conversion factor. In California and New York a limit of $10,000 applies to losses arising from any single claim. In some states a small portion of claim adjustment is transferred from the loss conversion factor to the basic premium. In certain other states a small portion of the provision for home office administration expense is transferred from the basic premium to the loss conversion factor.[6]

Basic, minimum and maximum premiums are the product of the standard premium, that is, the premium that would apply if the risk did not come under the Retrospective Rating Plan, and the basic, minimum and maximum ratios. These ratios are equal for all states and vary by size of standard premium, except that the California and New York basic ratios are slightly higher than those for other states, because of the increase in the insurance charge due to the $10,000 limit per claim in force in these states.

The basic premium ratio and the loss conversion factor may be expressed by the following formulas:

$$(8)\quad \text{basic premium ratio} = \frac{1}{1-\text{tax.}}\Big[\text{H.O. Admin.} + \text{P.A.} + \text{Insp.} + \text{acq.} \times \text{minimum premium ratio} + (\text{Ind. Comm.} + \text{partial claim exp.}) + \text{insurance charge} + \text{contingency margin}\Big]$$

$$(9)\quad \text{loss conversion factor} = \frac{1 + \dfrac{\text{cl. adj.} + (\text{partial h.o. admin.})}{\text{permissible loss ratio}}}{1 - \text{taxes}}$$

(6) See S. D. Pinney: The Retrospective Rating Plan for Workmen's Compensation Risks. P.C.A.S., Vol. XXIV, part 2.

The items in parentheses may not apply in some states. The expense provisions in these two formulas are intended to be expressed as ratios to the standard premium. Claim expense and partial home office administration (if any) in the loss conversion factor are therefore divided by the permissible loss ratio in order to express them in terms of losses.

In the application of the Retrospective Rating Plan to ex-medical risks, Assumption B regarding the expense provision has been used exactly as in the establishment of ex-medical discounts. With respect to Assumption A, regarding the ex-medical pure premiums, no consistent attitude has been taken as shall be shown later on.

The rules relating to ex-medical risks may be quoted from paragraph 2 of Section III of the New York Retrospective Rating Plan in the form which is in effect since July 1, 1940:

> As applied to risks written on an ex-medical basis, the Retrospective Premium shall be determined as follows:
>
> (a) The ex-medical coverage premium will be established by application of the approved ex-medical rates, the Experience Rating Plan, and the Schedule Rating Plan where the latter is applicable.
>
> (b) The statutory medical coverage premium will be calculated by dividing the ex-medical coverage premium for each classification by the complement of the ex-medical discount for such classification.
>
> (c) The Basic Premium ratio will be determined from the regular table of such ratios upon the basis of the statutory medical coverage premium, but shall be adjusted for ex-medical coverage. Such adjustment shall be obtained from the Board and shall be expressed as a percentage of the Minimum Premium ratio.
>
> The Minimum and Maximum Premium ratios will be determined from the regular table of such ratios upon the basis of the statutory medical coverage premium.
>
> (d) The Basic Premium will be determined by application of the adjusted Basic Premium ratio to the statutory medical coverage premium.

(e) The Minimum and Maximum Premiums will be determined by application of the Minimum and Maximum Premium ratios respectively to the ex-medical coverage premium.

(f) The Loss Conversion Factor shall be adjusted to compensate for any deficiency in expense resulting from the application of ex-medical factors, and shall be obtained from the Board.

(g) Determination of losses, incurred during the Rating Period. Actual incurred losses shall be used subject to a limit of $8,000 for the indemnity cost of any claim.[7]

In keeping with Assumption B, the basic premium is essentially the same for risks insured on ex-medical and statutory bases, and therefore the basic premium for ex-medical risks is obtained by applying the basic premium ratio to the statutory coverage standard premium. There are, however, two components of the basic premium which are affected by ex-medical coverage. The first is the provision for acquisition. This expense item is based on the ex-medical minimum premium which, according to point (e) above, is obtained by application of the minimum premium ratio to the ex-medical standard premium; it must therefore be smaller for ex-medical risks than for statutory coverage risk. For this reason the adjustment of the basic premium ratio mentioned in point (c) has been introduced effective July 1, 1940. Previous to this date, ex-medical risks were charged for acquisition on a statutory basis although the actual acquisition payable was reduced. A derivation of the formula used for this adjustment of the basic premium ratio is given below. The second component of the basic premium which will be affected by the exclusion of medical liability is the insurance charge. No attempt has been made as yet to correct the basic premium for a change in this item, chiefly because no statistical material is available to determine the exact amount of the ex-medical insurance charge. At the end of this part of the paper an attempt will be made to arrive at some estimate of the error involved.

Before discussing point (f) above, the adjustment of the basic premium ratio on account of the redundancy in the provision for acquisition shall be determined. The provision for acquisition of

(7) Only in effect in New York.

risks under the Retrospective Rating Plan expressed in terms of the statutory coverage standard premium is the following:

for statutory coverage

acq. × min. prem. ratio

for ex-medical coverage

acq. × min. prem. ratio × (1 — average ex-med. disc.)

The average ex-medical discount is the proportion by which the statutory coverage standard premium of the ex-medical risk must be reduced in order to obtain the ex-medical standard premium. It is, hence, a weighted average of the ex-medical discounts of the various classifications of the risk. The redundancy for acquisition in the basic premium ratio is, therefore, equal to the difference of the amounts shown above, then loaded for taxes. Hence:

(10) redundancy =

$$\left(\frac{\text{acq.}}{1-\text{tax.}}\right) \times \text{average ex-med. disc.} \times \text{minimum premium ratio.}$$

The ratio $\frac{\text{acq.}}{1-\text{tax.}}$ is a constant for each state, for instance equal to .155 in New York and .179 in Connecticut. In order to be able to inform the insured at the beginning of the policy period of the reduction of the basic premium ratio which will apply to his policy, the expected average ex-medical discount is computed on the basis of past experience, namely, on the basis of the experience of the last year of the experience period used in experience rating. In New York this average ex-medical discount is computed as a weighted average of the ex-medical discounts for all classifications involved. In other states the ex-medical discount corresponding to the governing classification is used. This latter method is somewhat simpler but less accurate. Since the minimum premium ratio varies between .750, for risks with a statutory coverage standard premium of $5,000, and .500, for risks with a statutory coverage standard premium of $75,000 and over, the correction of the basic premium ratio for an ex-medical risk with an average ex-medical discount of .20 will vary between $.155 \times .20 \times .75 = .023$ and $.155 \times .20 \times .50 = .016$ in New York and between $.179 \times .20 \times .75 = .027$ and $.179 \times .20 \times .50 = .018$ in Connecticut. The correction is, as one sees, quite substantial.

In point (f) above it is stated that the ex-medical loss conversion factor shall be adjusted to compensate for any deficiency in expense resulting from the application of ex-medical discounts. More precisely this factor is adjusted in such a manner that the amount in dollars of claim expense and partial home office administration expense (if included in the loss conversion factor) is equal, over all, for risks written on statutory and ex-medical bases. This principle is in exact agreement with Assumption B. In order to translate this principle into formulas the following abbreviations may be made: cl. adj. shall designate that portion of claim adjustment expense and partial home office administration expense (if any), expressed in terms of manual rates, which is included in the loss conversion factor. L. and E.L. shall designate the regular and the ex-medical loss conversion factors respectively. From formula (9) it can be followed that

$$(11)\quad \text{cl. adj.} = [(1 - \text{tax.}) \times \text{L.} - 1] \times \text{permissible loss ratio.}$$

According to the principles stated above, the expense provision in the ex-medical loss conversion factor multiplied by ex-medical losses shall provide the same amount in dollars overall, as $\frac{\text{cl. adj.}}{\text{permissible l. r.}}$ multiplied by statutory coverage losses. This means:

$$\text{cl. adj. prov. in E.L.} \times \Sigma \text{ classification payrolls extended at ex-med. p.p.'s.} = [(1 - \text{tax.}) \times \text{L.} - 1] \times \Sigma \text{ classification payrolls extended at total p.p.'s.}$$

or

$$(12)\quad \text{cl. adj. prov. in E.L.} = [(1-\text{tax.}) \times \text{L.}-1] \times \frac{\Sigma \text{ class payrolls extended at tot. p.p.}}{\Sigma \text{ class payrolls extended at ex-med. p.p.}}$$

Here Σ indicates the summation over the different classifications of the risk.

In order to express the second factor as a function of the ex-medical discount an assumption must be made regarding the ex-medical pure premium. If, in agreement with the present method employed in the determination of ex-medical rates, Assumption A is used, the formula above can be transformed by

means of formula (2b) for the ex-medical discount in the following manner:

(13) cl. adj. prov. in E.L. =

$$[(1-\text{tax.})\times\text{L.}-1]\times\frac{1}{1-\frac{.80}{.60}\times\text{average ex-med. disc.}}$$

$$=[(1-\text{tax.})\times\text{L.}-1]\times\frac{.60}{.60-.80\times\text{aver. ex-med. disc.}}$$

If instead of the present formula for the ex-medical discount the more accurate formula (3b) were used one would obtain

(14) cl. adj. prov. in E.L. $=[(1-\text{tax.})\times\text{L.}-1]\times$

$$\frac{\text{permissible l. r.}}{\text{permissible l. r.}-(1-\text{acq.}-\text{tax.})\times\text{aver. ex-med. disc.}}$$

This same formula would result if both the determination of ex-medical discounts and of ex-medical loss conversion factors were based on the proposed Assumption C instead of Assumption A.

At present none of the foregoing formulas is used; the provision for claim adjustment in E.L. is instead calculated as equal to

(15) $$[(1-\text{tax.})\times\text{L.}-1]\times\frac{.60}{.60-\text{average ex-med. disc.}}$$

This formula is a consequence of the assumption that for risks under the Retrospective Rating Plan the ex-medical pure premium is equal to the total pure premium less 100% of the medical pure premium. Indeed, on the basis of this assumption one obtains from (12)

cl. adj. prov. in E.L. =

$$[(1-\text{tax.})\,\text{L.}-1]\times\frac{1}{1-\frac{1}{.60}\text{average ex-med. disc.}}$$

which is identical with (15). In New York formula (15) is modified by substituting .598 for .60.

There is no apparent reason why, in the case of ex-medical risks under the Retrospective Rating Plan, a different assumption regarding the ex-medical pure premium should be made than for other ex-medical risks, even if the assumption made in this case corresponds more closely to reality as discussed previously. The method used at present tends to increase the provision for claim expense in the ex-medical loss conversion factor, and, consequently,

this factor itself, beyond the amount which would follow from a consistent application of Assumption A. Nevertheless the ex-medical loss conversion factors calculated by the present method are probably nearer to the "true" factors than those which follow from the more consistent formulas (13) or (14). The best solution would be to adopt Assumption C and then to calculate ex-medical discounts according to formula (5b) and the claim expense provision in the ex-medical loss conversion factor according to formula (14).

From formulas (15) and (14) for the claim expense provision in the ex-medical loss conversion factor, expressed in terms of ex-medical losses, the following formulas for the complete ex-medical loss conversion factor are derived:

$$(16)\quad \text{E.L.} = \frac{1}{1-\text{tax.}}\left([(1-\text{tax.})\times \text{L.}-1]\times\frac{.60}{.60-\text{average ex-med. disc.}}+1\right)$$

for the ex-medical loss conversion factor as used at present and

$$(17)\quad \text{E.L.} = \frac{1}{1-\text{tax.}}\times\left([(1-\text{tax.})\times \text{L.}-1]\times\frac{\text{permissible l. r.}}{\text{permissible l. r.}-(1-\text{acq.}-\text{tax.})\times\text{aver. ex-med. disc.}}+1\right)$$

for the revised ex-medical loss conversion factor if the proposed Assumption C regarding ex-medical pure premiums should be adopted also for the calculation of ex-medical rates.

Assuming average ex-medical discounts of .15, .20 and .25 and considering that L. = 1.18 for New York and 1.12 for Connecticut, the following ex-medical loss conversion factors would be obtained in these two states according to the present and to the proposed method:

TABLE V

EX-MEDICAL LOSS CONVERSION FACTORS

	Connecticut L. = 1.12			New York L. = 1.18		
Average ex-medical discount (Form. 3b)	.15	.20	.25	.15	.20	.25
Loss conversion factor						
Present method (Form. 16)	1.151	1.167	1.187	1.228	1.252	1.283
Proposed method (Form. 17)	1.143	1.153	1.164	1.218	1.234	1.255
Average ex-medical discount (Form. 5b)	.18	.24	.30	.18	.24	.30
Loss conversion factor						
Proposed method (Form. 17)	1.149	1.162	1.178	1.227	1.251	1.280

The first two sets of loss conversion factors are really not comparable since the revised method for the calculation of the ex-medical loss conversion factor is coupled with the proposal that the ex-medical discounts be also revised on the basis of Assumption C. Risks which at present have average ex-medical discounts of .15, .20 or .25 will have ex-medical discounts of .18, .24 and .30 respectively on the basis of Assumption C

$$\left(\text{new discounts} = \frac{.95}{.80} \times \text{old discounts}\right).$$

The loss conversion factors on the basis of the proposed method for risks with average ex-medical discounts of .18, .24 or .30 are those in the last line of Table V. These loss conversion factors are almost equal to those obtained from the present method which is due to the fact that the former are based on ex-medical pure premiums excluding 95% of the medical pure premium while the latter are based on ex-medical pure premiums excluding 100% of the medical pure premium. The examples confirm that the present method of calculating ex-medical loss conversion factors, although inconsistent with the method used in the derivation of ex-medical rates, yields factors which are in fair agreement with the factors theoretically more correct. The error lies in the present method of calculating ex-medical discounts, and a consistent treatment of all ex-medical risks, whether subject to the Retrospective Rating Plan or not, can be achieved only by revising the method of calculating ex-medical discounts on the basis of the proposed Assumption C.

If in the future also a reduction of claim adjustment expense from the proportion c to the proportion c' of the statutory coverage standard premium should be taken into consideration in the calculation of ex-medical discounts, the term [(1—taxes)×L.—1] in formulas (16) and (17) would have to be reduced by

$$\frac{c - c'}{\text{permissible l. r.}}.$$

An attempt will now be made to calculate for some representative examples the difference in the insurance charges and claim adjustment and taxes thereon for risks written on statutory and ex-medical bases which develop the same statutory coverage standard premium. For this purpose it may be remembered that the

insurance charge, in terms of standard premium, for risks written on a statutory basis in states other than New York or California is equal to

(18)

$$\text{permissible l. r.} \times \left[\frac{\text{losses in excess of loss prov. in max. prem.}}{\text{total losses}} + \frac{\text{losses not in excess of loss prov. in min. prem.}}{\text{total losses}} \right] - \frac{\text{loss prov. in min. prem.}}{\text{standard premium}}$$

The fractions inside the square brackets are taken from the charts used in the structural analysis of the Retrospective Rating Plan,[8] which show the proportion of losses in excess of any given loss ratio for different premium size groups. These charts are based on statutory coverage losses. The term "losses not in excess of (any given) loss provision," used in formula (18) and hereafter, is intended to mean all losses for risks whose losses amount to no more than the given loss provision, and losses equal to the given loss provision for risks whose entire losses amount to more than the given loss provision.

The formula for the ex-medical insurance charge, in terms of the statutory coverage standard premium, is:

(19) ex-medical insurance charge =

$$\text{permissible l. r.} \times \left[\frac{\text{ex-med. losses in excess of loss prov. in ex-med. max. prem.}}{\text{total stat. cov. losses}} + \frac{\text{ex-med. losses not in excess of loss prov. in ex-med. min. prem.}}{\text{total stat. cov. losses}} \right] - \frac{\text{loss prov. in ex-med. min. prem.}}{\text{stat. cov. standard premium}}$$

No charts for indemnity losses only or for total losses of ex-medical risks are available which would permit the exact computation of the ex-medical insurance charge by means of formula (19). Therefore, in order to permit the use of the existing charts

(8) New charts based on experience of policy years 1934 to 1937 inclusive are in course of preparation by the Compensation Insurance Rating Board.

for ex-medical coverage, some assumption regarding the distribution of ex-medical losses in excess of given loss ratios will have to be made. This will be done by formulating a minimum assumption and a maximum assumption with the aim of obtaining lower and upper limits for the ex-medical insurance charge.

All loss ratios in the following are intended to be ratios of losses to the statutory coverage standard premium.

The simplest minimum assumption is the following:

Assumption E:

The average ratio m of medical losses to total losses does not vary with the loss ratio of the risk.

If e designates the average ratio of ex-medical losses to statutory coverage losses, and $l.r.$ any loss ratio in terms of statutory coverage standard premium, then e does not vary with the loss ratio $l.r.$ of the risk and is therefore equal to

$$\frac{\text{ex-medical p.p.}}{\text{total p.p.}}$$

and we have consequently, according to Assumption C,

$$e = 1 - .95\,m$$

From the invariance of e follows:

(20)

$$\frac{\text{ex-med. losses in excess of } l.r.}{\text{tot. stat. cov. losses}} = e \times \frac{\text{stat. cov. losses in excess of } \frac{l.r.}{e}}{\text{tot. stat. cov. losses}}$$

The latter expression can be derived from existing charts. Assumption E is incorrect for high loss ratios because these are often caused by claims involving a relatively high indemnity cost and a medical cost not correspondingly high. The ratio is therefore probably underestimated for high loss ratios.

A maximum assumption which over-compensates this defect would be:

Assumption F:

The average ratio m' of medical losses to total losses for that portion of losses which does not exceed

$g \times$ statutory coverage standard premium,

where $g = 1.20 \times$ permissible loss ratio,

does not vary with the loss ratio of the risk. Losses in excess of

$g \times$ statutory coverage standard premium

are considered to consist of indemnity losses only.

$g = .720$ and $.750$ for permissible loss ratios of .600 and .625 respectively.

This assumption certainly overestimates the ratio; the truth will be somewhere between Assumptions E and F. Both assumptions permit the use of the existing charts and, hence, allow the calculation of numerical examples.

If e' designates the average ratio of ex-medical to statutory coverage losses for that portion of statutory coverage losses which does not exceed $g \times$ statutory coverage standard premium, then e' does not vary with the loss ratio of the risk and must be smaller than e, because for the portion of statutory coverage losses exceeding $g \times$ statutory coverage standard premium (if any) the ratio of ex-medical to statutory coverage losses is equal to unity according to Assumption F, and because this ratio, over all, must be equal to

$$\frac{\text{ex-med. p.p.}}{\text{total p.p.}} = e$$

Indeed, let p be the proportion of statutory coverage losses in excess of $g \times$ statutory coverage standard premium to total statutory coverage losses for all risks combined. This ratio can be derived from the existing charts. Then according to Assumption F, one has:

Ex-medical losses for all risks combined =

$$[(1-p) \times e' + p \times 1] \times \text{statutory coverage losses for all risks combined}$$

and this, according to what was said above, is equal to

$e \times$ statutory coverage losses for all risks combined.

From this follows:

$$(21)\quad (1-p)\,e' + p = e \text{ or } e' = \frac{e-p}{1-p} < \frac{e-ep}{1-p} = e$$

Then, if a risk written on a statutory basis has a loss ratio $L.R.$, on the average the corresponding loss ratio in terms of the statutory coverage premium which would result on the basis of Assumption F, if the risk were written on an ex-medical basis, would be:

(22a)

$$e' \times L.R. \qquad \text{for } L.R. \leqq g$$

(22b)

$$e' \times g + 1 \times (L.R.-g) = L.R. - (1 - e')\, g \text{ for } L.R. \geqq g$$

If, vice-versa, the loss ratio of an ex-medical risk in terms of the statutory coverage premium is $l.r.$, on the average the corresponding loss ratio which would result, on the basis of Assumption F, if the risk were written on a statutory basis would be:

(23a)

$$\frac{l.r.}{e'} \qquad \text{for } l.r. \leqq e'g$$

(23b)

$$\frac{e' \times g}{e'} + 1 \times (l.r.-e'g) = l.r. + (1-e')\, g \text{ for } l.r. \geqq e'g$$

Hence, for $l.r. \leqq e'g$

(24a)

$$\frac{\text{ex-med. losses not in excess of } l.r.}{\text{total stat. coverage losses}} = e' \times \frac{\text{stat. cov. losses not in excess } \frac{l.r.}{e'}}{\text{total stat. coverage losses}}$$

and for $l.r. \geqq e'g$

(24b)

$$\frac{\text{ex-med. losses in excess of } l.r.}{\text{total stat. med. losses}} = \frac{\text{stat. cov. losses in excess of } [l.r. + (1 - e') \times g]}{\text{total stat. med. losses}}$$

The right hand expressions can be calculated from existing charts.

Formula (20) or formulas (24a) and (24b) will be substituted for the fractions inside the square brackets in formula (19) for the ex-medical insurance charge according to whether minimum Assumption E or maximum Assumption F is used. In either case this substitution permits the evaluation of formula (19) with the help of the existing charts for the distribution of statutory coverage losses by loss ratio.

The numerical examples in Table VI are calculated with the help of this formula and Assumptions B, C, E, and F for statutory coverage standard premiums of $5,000, $50,000 and $150,000 and average ex-medical discounts of .15, .20 and .25. The calculations are performed for the State of Connecticut in order to avoid the complicating influence of the limit per claim imposed on incurred losses in New York and California. In view of the relatively small size of the insurance charge, it is assumed, for the purpose of this calculation, that any change in the insurance charge provision would not alter the basic premium ratio but only affect the contingency margin therein.

These calculations show that the insurance charge increases by .02 to .05 of the statutory coverage standard premium for risks with $5,000 statutory coverage premium, from .00 to .01 for risks of $50,000 and not at all for risks of $150,000. The correct increase is probably nearer to the higher figures and relatively larger for risks with larger average ex-medical discounts. As one sees, the increase in the insurance charge is not negligible, particularly for risks of smaller sizes and for high ex-medical discounts. The result of the calculation probably applies equally well to states other than Connecticut. There is a contingency margin in the basic premium which varies from .05 to .07 for risks with a standard premium of $5,000 to .00-.01 for risks with a standard premium of $150,000. This margin appears to be just sufficient to absorb the indicated increase in the insurance charge of ex-medical risks. Special care should be taken in states where risks with standard premiums down to $1,000 are eligible for the Retrospective Rating Plan. The numerical amount of the increase in the insurance charge due to ex-medical coverage may change after adoption of new charts for the ratio of excess losses to total losses as a function of the loss ratio which are being calculated by the New York Compensation Insurance Rating Board. In view of

the substantial increase in the insurance charge due to ex-medical coverage which is indicated by the example shown above, it would be advisable that the study on which the new charts are to be based be enlarged to prepare the basis for charts dealing with indemnity losses only.

Influence of Ex-Medical Experience on the Rate Making Procedure

The use of ex-medical experience for the determination of classification relativities, rate levels and loss constants does not cause any distortion of the results, because in each case medical losses are adjusted to bring ex-medical experience to a statutory basis.

Retrospective Rating Plan
Estimate of Ex-Medical Insurance Charge

Statutory Coverage Standard Premium	Average Ex-Medical Discount	Basic Ratio	Minimum Ratio	Maximum Ratio	Ex-Med. Adjustment of Basic Ratio (Form.(10)) .175/.975 x(2)x(4)	Ex-Med. Basic Ratio (3) − (6)	Ex-Med. Minimum Ratio in Terms of (1) (4)x[1 − (2)]	Ex-Med. Maximum Ratio in Terms of (1) (5)x[1 − (2)]	Stat. Coverage Loss Conversion Factor	Ex-Medical Loss Conversion Factor Form.(14)	Loss Provision in Ex-Medical Minimum Premium [(8) − (7)] ÷ (11)	Loss Provision in Ex-Medical Maximum Premium [(9) − (7)] ÷ (11)	e = ex-med. p.p. / tot. p.p. = 1 − 1.28x(2)(a)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
$ 5,000	.15	.300	.750	1.750	.020	.280	.638	1.488	1.12	1.143	.313	1.057	.808
50,000	.15	.275	.550	1.350	.015	.260	.468	1.148	1.12	1.143	.182	.777	.808
150,000	.15	.225	.500	1.250	.013	.212	.425	1.063	1.12	1.143	.186	.745	.808
5,000	.20	.300	.750	1.750	.027	.273	.600	1.400	1.12	1.153	.284	.977	.744
50,000	.20	.275	.550	1.350	.020	.255	.440	1.080	1.12	1.153	.160	.716	.744
150,000	.20	.225	.500	1.250	.018	.207	.400	1.000	1.12	1.153	.167	.688	.744
5,000	.25	.300	.750	1.750	.034	.266	.563	1.313	1.12	1.164	.255	.899	.680
50,000	.25	.275	.550	1.350	.025	.250	.413	1.013	1.12	1.164	.140	.655	.680
150,000	.25	.225	.500	1.250	.022	.203	.375	.938	1.12	1.164	.148	.631	.680

g = 1.20x.625	p From Chart	e′ = (e − p)/(1 − p) Form.(21)	e′g (17)x(15)	Assumption E (12) ÷ (14)	Assumption E (13) ÷ (14)	Assumption F Form. (23a) (12) ÷ (17)	Assumption F Form. (23b) (13) + .750[1 − (17)]	From Charts (b) Assumption E 1. not in exc. of (19) total losses	Assumption E 1. in exc. of (20) total losses	Assumption F 1. not in exc. of (21) total losses	Assumption F 1. in exc. of (22) total losses
(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
.750	.346	.706	.530	.387	1.308	.443	1.277	.460	.160	.503	.168
.750	.136	.778	.584	.225	.962	.234	.943	.363	.063	.376	.066
.750	.078	.792	.594	.230	.922	.235	.901	.378	.020	.386	.023
.750	.346	.609	.457	.382	1.313	.466	1.270	.455	.158	.518	.170
.750	.136	.704	.528	.215	.962	.227	.938	.348	.062	.366	.067
.750	.078	.722	.542	.224	.925	.231	.896	.369	.020	.380	.024
.750	.346	.511	.383	.375	1.322	.499	1.266	.450	.156	.540	.171
.750	.136	.630	.473	.206	.953	.222	.932	.335	.062	.359	.069
.750	.078	.653	.490	.218	.929	.227	.891	.360	.019	.374	.025

Net Insurance Charge (b) Assumption E Ex-Med. l. not in exc. of (12) ÷ tot. stat. cov. l. (23)x(14) Form. (20)	Net Insurance Charge (b) Assumption E Ex-Med. l. in exc. of (13) ÷ tot. stat. cov. l. (24)x(14) Form. (20)	Net Insurance Charge (b) Assumption F Ex-Med. l. not in exc. of (12) ÷ tot. stat. cov. l. (25)x(17) Form. (24a)	Net Insurance Charge (b) Assumption F Ex-Med. l. in exc. of (13) ÷ tot. stat. cov. l. (26) Form. (24b)	Net Insurance Charge (b) Assumption E .60[(27) + (28)] − (12) Formula (19)	Net Insurance Charge (b) Assumption F .60[(29) + (30)] − (12) Formula (19)	Net Insurance Charge (b) Stat. Cov.(c)	Gross Insurance Charge Assumption E (31)x(11)	Gross Insurance Charge Assumption F (32)x(11)	Gross Insurance Charge Stat. Coverage (33)x(10)	Difference Assumption E (34) − (36)	Difference Assumption F (35) − (36)
(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)
.372	.129	.355	.168	−.012	.001	−.021	−.014	.001	−.024	.010	.025
.293	.051	.293	.066	.024	.033	.028	.027	.038	.031	−.004	.007
.305	.016	.306	.023	.007	.011	.011	.008	.013	.012	−.004	.001
.339	.118	.315	.170	−.010	.007	−.021	−.012	.008	−.024	.012	.032
.259	.046	.258	.067	.023	.035	.028	.027	.040	.031	−.004	.009
.275	.015	.274	.024	.007	.012	.011	.008	.014	.012	−.004	.002
.306	.106	.276	.171	−.008	.013	−.021	−.009	.015	−.024	.015	.039
.228	.042	.226	.069	.022	.037	.028	.026	.043	.031	−.005	.012
.245	.013	.244	.025	.007	.013	.011	.008	.015	.012	−.004	.003

(a) Ex-medical discount for Connecticut: $\frac{.95x.625}{.800}\frac{\text{med.p.p.}}{\text{tot.p.p.}}$ (Form. (5b)). $e = 1 - .95\frac{\text{med.p.p.}}{\text{tot.p.p.}} = 1 - \frac{.800}{.625}$ ex-med.disc. $= 1 - 1.28x(2)$

(b) The procedure is that followed by the National Council in its analysis of the basic premium for numerous states. Since the charts used are based on a permissible loss ratio of .600, it would be more correct to key the indications of (19), (20), (21) and (22) to a permissible loss ratio of .600 and then to express the excess pure premium ratios obtained from the charts in terms of statutory coverage standard premium by multiplying with .625 instead of .60. The National Council procedure has been followed in order to avoid a recalculation of the statutory coverage insurance charge.

(c) See Calculation of Distribution of Basic Retrospective Premium for Connecticut issued by the National Council on July 6, 1939 (pages 2 and 2a.).

RECENT DEVELOPMENTS IN NEW YORK COMPENSATION RATE MAKING

BY

ROGER A. JOHNSON, JR.

At the November 1939 meeting, a paper entitled "The Practice of Workmen's Compensation Rate Making as Illustrated by the 1939 Revision of New York Rates" was presented by Mr. C. M. Graham.

The main purpose of this paper is to point out the important changes in method which occurred in the 1940 New York rate revision. To those in close contact with the Actuarial Committee of the Compensation Insurance Rating Board this may be an old story, but to others who wish to follow the latest developments in Workmen's Compensation rate making these remarks may be of interest.

A. Composite Year of Unit Statistical Plan Experience

The most important change was in the method of rate level determination. For many years rate level changes in New York had been computed from the loss ratios produced by the New York Semi-Annual Loss Ratio Data. Various disadvantages were present in this loss ratio method: (1) An uncontrolled element of loss reserves caused considerable fluctuation because some carriers may employ one basis in setting up reserves while others use another, and some may vary their methods from year to year; (2) favorable supplementary occupational disease experience and catastrophe experience which have tended to depress the general rate level have been included; whereas one or more years of poor experience could have had a serious adverse effect on the rate level stability; and (3) although the permissible loss ratio for ex-medical risks would average somewhat lower than for statutory medical coverage, no adjustment could be made for risks written on an ex-medical basis.

The new method was based on the use of a composite policy year of experience reported under the Unit Statistical Plan. This consisted of the policy year from July, 1937 to June, 1938 inclusive, using experience from Schedule "Z" for the last six months of

policy year 1937, and the original reports and all available corrections for the first six months of policy year 1938. It would, under the Unit Plan of monthly reportings, have been possible to use any twelve-month period, but June is the latest available month at the time of the New York rate revisions, and it so happens that the same manual rates are in effect during this July-June period. Mr. R. P. Goddard, in his paper "Policy Year Modification of Losses" in Volume XXVI of the *Proceedings,* pointed out the fact that the policy year is not the smallest unit of experience available and suggested other situations where monthly data could be advantageously employed.

All payrolls were extended by classification at manual rates excluding the general occupational disease and catastrophe loadings which were applied separately. The premium at 4/1/40 collectible rates was obtained by removing the combined offsetting adjustment factors and applying the proper development factors.

The losses, with catastrophe losses and certain general occupational disease losses shown separately, were summarized by kind of injury and then law amendment and development factors were applied. Cases of Federal classes under the United States Longshoremen's and Harbor Workers' Act were handled separately since separate law amendment factors apply. In order to obtain an adjustment for risks written on an ex-medical basis, the ex-medical payrolls were extended by classification at the July 1, 1939 selected medical pure premium multiplied by .962, which factor was obtained as follows:

$$\frac{1.019}{1.012 \times 1.043 \times 1.003} = .962$$

where 1.012 is the Security Funds factor, 1.043 the contingency loading factor and 1.003 the Reopened Case Fund law amendment factor in the July 1, 1939 total rate level factor of 1.019. This produced a figure for expected medical losses on ex-medical risks if they had been written on a statutory medical coverage basis. This adjustment was made in order to place the experience used for rate level determination purposes on a full coverage basis; the ex-medical payroll experience had already been extended at full medical rates.

The development factors were originally based on two-year arithmetical averages, but it was felt that unusual circumstances

had entered into their determination, producing unusually high factors quite out of line with actual current development. Subsequent discussion of this problem produced the suggestion that one-year development factors (i.e., based on policy year 1936 for development from first report to second, 1935 from second to third, and 1934 from third to fourth) be used in this transition year, but that two-year factors be used in the future to maintain a desirable degree of stability.

Table I below summarizes the experience for the composite year July, 1937 to June, 1938 inclusive:

TABLE I

WORKMEN'S COMPENSATION — NEW YORK
INDICATED RATE LEVEL CHANGE EFFECTIVE JULY 1, 1940
Based on Composite Year of Unit Statistical Plan
Experience — July, 1937 through June, 1938

Coverage	Prem. at 4/1/40 Collectible Rates	Incurred Losses (Developed Basis) on 7/1/39 Law Level	Loss Ratio (3) ÷ (2)	Indicated Change in Collectible Rate Level*
(1)	(2)	(3)	(4)	(5)
(a) Standard	$69,799,424	$37,592,490	53.86%	.916
(b) General O.D.	731,802	20,003	2.73	xxx
(c) Sub-Total (a) + (b)	70,531,226	37,612,493	53.33	.907
(d) Catastrophe	409,886	16,297	3.98	xxx
(e) Total (c) + (d)	70,941,112	37,628,790	53.04	.902

* $\frac{(4)}{60.0\% - 0.0} \times 1.012 \times 1.008$
Contingency Loading = 0.0%
Security Funds Factor = 1.012
Law Amendment Factor = 1.008 for 7/1/40 amendment to Section 25a — Reopened Case Fund.

Inasmuch as general occupational disease and catastrophe premiums are obtained by specific loadings on the manual rate, it was felt they should be handled separately, but the Committee reached the conclusion that the general O.D. experience should be included in determining the rate level. The figure of $20,003 shown in Table I for general O.D. losses represents only dust disease losses for classes without specific occupational disease rates. All of the remaining general O.D. losses were included in the $37,592,490 figure for standard coverage losses because it would have been

difficult to segregate the data for diseases, other than dust diseases, which were made compensable by an amendment to the Workmen's Compensation Act effective September 1, 1935 and which are provided for by the one percent loading. Certain kinds of occupational diseases have been compensable for years and the effect of the 9-1-35 law amendment was to extend the benefits of the Compensation Act to all other types of occupational disease cases. Obviously, it would be very difficult to distinguish, for statistical purposes, between cases previously covered and those newly covered by the broad extension of the Act.

On the other hand, it was concluded that a single year of catastrophe experience is not indicative and that this experience should be excluded from the rate level calculations in order to avoid fluctuation and distortion from year to year. The Committee voted to continue for the present the existing method of determining the general occupational disease and catastrophe loadings. The .907 figure was adopted by the Actuarial Committee and approved by the New York Insurance Department.

B. "k" Factor in Loss Constant Calculations

Another change instituted in the 1940 rate revision was the introduction of a *"k"* factor in the formulae for the calculation of loss constants and offsetting adjustment factors to give consideration to the fact that not all risks over $500 annual premium size are subject to experience rating.

"k" is defined as the proportion of premium for risks over $500 which is subject to experience rating. The following test was used to determine the *"k"* values:

TABLE II

WORKMEN'S COMPENSATION — NEW YORK
Policy Year 1937 — First Report

Industry Group	Earned Premium— All Risks Over $500	Earned Premium— Experience Rated Risks Over $500	Ratio (3)/(2)	Adopted "k" Value
(1)	(2)	(3)	(4)	(5)
Manufacturing	$19,072,147	$17,162,337	.900	.90
Contracting	14,939,071	9,741,793	.652	.65
Federal	1,348,738	1,196,548	.887	.90
All Other	19,861,943	16,671,403	.839	.85

Test of earlier years produced approximately the same results, showing that these factors are relatively stable.

The result is accounted for by variation in the premium of individual risks from year to year, new enterprises, changes in ownership barring the use of the past experience for rating purposes, and the statistical practice of assigning short term risks to premium size group on the basis of the projected annual premium.

In the formula for the offsetting adjustment factors, the average credibility (z) and the 1939-40 credit off-balance of the experience rating plan (b_1) were modified by the "k" factor as follows:

$$a_2 = \frac{e - k\,z + k\,b_1}{1 - k\,z}$$

The expected credit off-balance (b_2) was modified by the "k" factor to produce the expected final modification of all risks over $500.

$$\text{mod.} = 1. - k\,b_2$$

C. *Test of Loss Constants and Offsetting Adjustment Factors by Class Industry Group*

An interesting test was recently made by the Actuarial Department of the Compensation Insurance Rating Board with respect to loss constant calculations on a class industry group basis as against the present risk industry group method. Although the offsetting adjustment factors are determined on a risk industry group basis, they are applied by classification in determining manual rates, and the question arose as to whether this produces a significant difference in the final results.

The following table shows conclusively that the amount of premium in any risk industry group which is transferred into a different class industry group is sufficiently offset by premium passing in the opposite direction so that the effect of applying the offsetting adjustment factors on either basis is approximately the same.

TABLE III

WORKMEN'S COMPENSATION — NEW YORK

TEST OF REALIZED OFFSETTING ADJUSTMENT FACTORS FOR LOSS CONSTANTS AND EXPERIENCE RATING PLAN OFF-BALANCE

Based on Experience of Policy Years 1935-1937
Underlying July 1, 1940 Loss Constant Calculations

Industry Group	Total Premium at Full Proposed Rate* by Risk Ind. Gr.	Total Premium at Full Proposed Rate* by Class Ind. Gr.	7/1/40 Adopted Offsetting Adjustment Factors	Total Premium by Risk Ind. Gr. with Offsetting Adjustment Factors Applied by Class Ind. Gr.	Average Offsetting Adjustment Factor (5)÷(2)	Ratio: Realized ÷ Adopted (6)÷(4)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Mfg.	$ 58,772,897	$ 54,274,383	.9842	$ 57,923,879	.9856	1.001
Contracting	37,829,946	40,078,841	1.0408	39,285,126	1.0385	.998
Federal	4,451,336	4,817,142	1.0000	4,447,222	.9991	.999
Serv. P.C.	2,720,660	2,963,148	1.0000	2,720,428	.9999	1.000
All Other	80,929,746	82,244,842	.9807	79,518,522	.9826	1.002
Sub-Total	184,704,585	184,378,356	.9949**	183,895,177	.9956	1.001
Window Cl.	461,356	787,585	1.0000	461,119	.9995	1.000
Total	$185,165,941	$185,165,941	..	..	..	..

* Prior to application of Offsetting Adjustment Factors for (1) Loss Constants and E. R. Plan Off-Balance and (2) Additional Premium from $5.00 Expense Constant.

** Average offsetting adjustment factor obtained using column (2) as weights.

We can conclude from this study that any distortion produced by applying risk industry group offsetting adjustment factors on a class industry group basis is negligible.

The 1940 loss constant calculations were then reproduced using payrolls and losses with the industry group determined by the classification itself rather than by the governing classification of the risk. Several obvious difficulties presented themselves, viz., that the number of risks, average credibility, and the credit off-balance from the experience rating plan are available only by risk industry group. Also, while the calculation of offsetting adjustment factors by class industry group might be more logical, it would be quite impractical to attempt to apply loss constants by classification. However, a comparison of the offsetting adjustment factors and loss and expense constants derived by these two methods follows:

TABLE IV

Industry Group	Offsetting Adjustment Factors Derived on the Basis of		Loss and Expense on the Basis of Constants Derived	
	Risk Ind. Gr.	Class Ind. Gr.	Risk Ind. Gr.	Class Ind. Gr.
Manufacturing	.9842	.9814	$24	$23
Contracting	1.0408	1.0372	28	32
Federal	1.0000**	1.0000**	28*	32*
Servants P.C.	1.0000**	1.0000**	5**	5**
All Other	.9807	.9846	15	14

* Adopted same as Contracting Industry Group.
** Adopted on basis of judgment.

It is believed that the present method of determining loss constants on a risk industry group basis is a more practicable and satisfactory method from all standpoints, and no change is warranted at the present time.

D. New York Expense Loading

In view of various proposals now under discussion which would affect expense loadings, it might be appropriate at this point to give a brief history of the expense loading in New York workmen's compensation rates. Prior to May 1, 1928, the permissible loss ratio was 60%, leaving 40% distributed as follows for the company expenses:

Acquisition	17.5%
Taxes	2.5
Claim Adj.	8.0
Inspection	2.5
H.O. Admin.	7.5
Payroll Audit	2.0
	40.0

On May 1, 1928, the loss and expense constant program was adopted, a $5.00 expense constant being applied to all risks whose annual premium was less than $400 (changed to $500 effective July 1, 1934). Although this did not change the permissible loss ratio for the total premium volume, it created a 60.5 permissible loss ratio for printed manual rates or a reduction of 00.83% in the proposed rates, determined as follows:

$$\frac{60.0}{60.5} = .9917$$

The 00.83% was distributed as follows:

Acquisition	17.5% × .0083	=	0.15%
Taxes	2.5 × .0083	=	0.02
Administration	$\frac{0.83\% - 0.17\%}{2}$	=	0.33
Payroll Audit		=	0.33
			0.83

Therefore, the revised percentage of the manual rates which would have been determined by use of a 60% permissible loss ratio totalled 39.17% and the percentage of final revised manual rates was 39.50%, as follows:

Acquisition	17.5%	− .15%	= 17.35%	÷ .9917	= 17.50%
Taxes	2.5	− .02	= 2.48	÷ .9917	= 2.50
Claim Adjustment	8.0		= 8.00	÷ .9917	= 8.07
Inspection	2.5		= 2.50	÷ .9917	= 2.52
Administration	7.5	− .33	= 7.17	÷ .9917	= 7.23
Payroll Audit	2.0	− .33	= 1.67	÷ .9917	= 1.68
	40.0		39.17	.9917	39.50

This 60.5 permissible loss ratio was in effect until the 1935 rate revision, at which time the 17.5% provision for Acquisition was separated by the Superintendent of Insurance into 15.0% for Acquisition and 2.5% for Industrial Commission Assessment and Social Security Taxes. Also, a loading of 1.012 for the 1% tax which stock and mutual companies must pay into their respective Security Funds entered into the rate structure, which was determined as follows:

$$\frac{1.0\%}{100\% - (15\% + 3.5\%)} = 1.2\%$$

The latter is a temporary factor which will drop out of the rate structure at some future date, but in the meantime the permissible loss ratio for the total premium volume was reduced to 59.3% (.600 ÷ 1.012 = .593). The permissible loss ratio underlying the printed manual rates became 59.8% (.605 ÷ 1.012 = .598). The complement of this figure, 40.2%, is the expense loading underlying the present printed manual rates, distributed as follows:

	In Total Premium Volume (Including L. & E. Constants)			In Printed Manual Rates (Excluding L. & E. Constants)		
Acquisition	15.0%		= 15.0%	15.00%		= 15.0%
Taxes	2.5	+ 1.0%	= 3.5	2.50	+ 1.0%	= 3.5
Claim Adjustment	8.0	÷ 1.012	= 7.9	8.07	÷ 1.012	= 8.0
Industrial Comm. Assessment & Soc. Security Act Taxes	2.5	÷ 1.012	= 2.4	2.50	÷ 1.012	= 2.4
Inspection	2.5	÷ 1.012	= 2.5	2.52	÷ 1.012	= 2.5
H. O. Administration	7.5	÷ 1.012	= 7.4	7.23	÷ 1.012	= 7.1
Payroll Audit	2.0	÷ 1.012	= 2.0	1.68	÷ 1.012	= 1.7
	40.0		40.7	39.5		40.2

ABSTRACT OF THE DISCUSSION OF PAPERS READ AT THE PREVIOUS MEETING

THE EFFECT OF DAYLIGHT SAVING TIME ON THE NUMBER OF MOTOR VEHICLE FATALITIES

JOHN A. MILLS

VOLUME XXVI, PAGE 328

WRITTEN DISCUSSION

MR. A. L. BAILEY:

Mr. Mills need not have concerned himself with the question of how much or how many of the many methods of presentation would demonstrate the findings that he had made in his study of the effect of daylight saving time on the number of motor vehicle fatalities. The conclusion that a considerable number of injuries and deaths might be avoided each year is reached repeatedly, irrespective of the method of attack, from the data with which he concerned himself, namely those for a group of larger cities.

However, in presenting data to serve as a basis for the determination of the approximate number of fatalities which would be prevented by the adoption of daylight saving time, Mr. Mills had to choose one from a more or less unlimited number of available combinations of figures. Reductions in fatalities of from one to some five percent would have been indicated from any of the various methods of attack. The method chosen by Mr. Mills and set forth in Appendix "D" of his paper produced a 2.7% reduction. Although this is about the average result, it represented, as will be pointed out, a rather unfortunate choice of procedure. Mr. Mills compared the increased fatalities during the evening hours of 6:00 P. M. to 10:00 P. M. with the fatalities occurring during the daylight hours of 10:00 A. M. to 3:00 P. M. in the standard time cities and the daylight saving time cities, respectively, restricting his investigation to the five summer months. Had he continued his investigation to the seven winter months, Mr. Mills would have reached the surprising conclusion that the use of daylight saving time during the summer months resulted in a reduction of accidents during the winter months some two and a half times as great as the reduction in accidents during the summer months. This result can be explained only by the fact that the cities not having daylight saving time had more traffic

during the evening than did the cities having daylight saving. (In other words, the black horses were involved in more accidents than were the white horses only because there were more black horses running around.)

There is one assumption implied throughout Mr. Mills' paper which it is believed should be pointed out. This assumption is that the greater number of accidents occurring after dark in the evening than during the day is the result only of the amount of traffic and the absence of light. Nothing is said of the effect of fatigue on the increased number of accidents during the latter part of the day, despite the recognition of this as one of the most important single elements by all safety engineering studies.

Personally, I favor the following attack on the problem of how many fatalities would be eliminated in the cities by the adoption of daylight saving time: As the hours up to 7:00 P. M. are light during the summer months in both daylight saving and non-daylight saving cities, it would seem that we need concern ourselves only with the period from 7:00 to 12:00 P. M. Furthermore, in order that the fatigue element may be averaged out, this period must be contrasted with an adjacent period of time involving hours both prior and subsequent to the critical period. Let us then select the period from 5:00 P. M. to 7:00 P. M. and the period from midnight to 6:00 A. M. to serve as a basis of comparison. Again, in order that we may not become involved in the black horse problem, let us concern ourselves with the relative change from winter to summer fatalities within the respective hours.

For the base period just described, fatalities in the cities without daylight saving showed a decrease of 36% from the winter to the summer months; for cities with daylight saving, the decrease was 38%. For the critical period of 7:00 P. M. to midnight, the cities without daylight saving showed a decrease of only 18% from the winter to the summer months; whereas the cities with daylight saving showed a 30% decrease. Thus, the cities without daylight saving showed an 18% lesser decrease in fatalities during the critical period, while the daylight saving cities showed an 8% lesser decrease during the base period. This produces a net difference of 10%, i.e. 10% of the fatalities during the period from 7:00 P. M. to midnight for the winter months in the cities

without daylight saving. This is equivalent to 1.6% of all fatalities during the year.

Having admitted that there is a definite saving in fatalities in the cities which have adopted daylight saving time, we come to the problem of evaluating the over-all effect of daylight saving on the total number of accidents occurring everywhere. The New York State accident reports show that from the winter to the summer months there is an 18% greater increase in fatalities during the hours of 8:00 P. M. to midnight, as compared to all other hours of the day, for New York State excluding New York City than there is for New York City. This can be taken only as a confirmation of the a priori belief that during the summer people leave the city in the evening whenever possible. It is only natural to expect that this exodus would be materially increased wherever and whenever an extra hour is available under a daylight saving schedule.

The problem is somewhat analogous to the effect on accidents sustained by employees when the work week is cut from forty-eight to forty-two hours. There it would be reasonable to expect that the number of accidents sustained by employees during their working hours would be reduced. It is quite conceivable, however, that the employees might spend the additional six hours available in activities far more productive of accidents than their normal employment.

Having lived both on the road from New York City to Jones Beach and on the road from New York City to Monticello and Ellenville, with the opportunity closely to observe traffic jams at their origin and noting that these jams occurred, not at seven o'clock or eight o'clock, but during the two hours immediately following darkness and that they disappeared concurrently with the end of daylight saving time in the fall, I personally would want to see a compilation of data for areas immediately adjacent to the metropolitan districts similar to the compilation presented by Mr. Mills for the cities before making any statement that the fatalities for such areas do not at least completely offset the savings in fatalities occurring in the cities themselves.

MR. A. W. WHITNEY:

Daylight saving is a funny thing, for one reason because it is so wholly a product of the fact that we do not like to get up in

the morning; it is just a little monument that we erect each summer to the bad habit of lying in bed.

The ordinary human being gets up at seven and goes to bed at eleven; in other words, he gets up five hours before noon and goes to bed eleven hours after noon. Now suppose he were to reverse the process and get up eleven hours before noon and go to bed five hours after noon. That ought to work just as well! It would mean he would get up at one o'clock in the morning and go to bed at five in the afternoon and his corresponding day's schedule in this reverse order might be, a game of bridge from half past one in the morning to half past four, watching the sun rise at four thirty, working in the garden for an hour, breakfasting at five thirty, getting to the office at seven, leaving for home at three o'clock, dining at four and going to bed at five. Observe that among people that prefer that kind of schedule, such as fishermen and milkmen, daylight saving would mean setting your watch back instead of ahead, so that you could have more daylight time in the morning that you could use for playing golf, or delivering milk, or fishing, or working in the garden.

That may not seem to have anything to do with Mr. Mills' paper, but it has, for if people did as much driving in the early morning hours as they do in the late afternoon hours, putting in our kind of daylight saving would not save lives, it would do just the opposite, as Mr. Mills implies.

Mr. Mills' paper is interesting and timely and valuable and excellent and he has certainly checked the situation up in enough ways quite thoroughly to demonstrate the proposition that universal daylight saving would mean a very appreciable further saving of life. Another rough way of getting at it would be to figure up the hours of darkness that daylight saving converts into hours of light and then apply to these the known difference in the fatality figures between driving at night and driving in the daytime. There are many good reasons for daylight saving and this very considerable saving of life is another of them and it is certainly very much to be desired that daylight saving be made universal.

MR. CHARLES S. WARREN:

In reviewing Mr. Mills' paper I readily concede that there should be a saving of lives under daylight saving, but when you

take into consideration the various factors that contribute to fatal accidents, you begin to doubt whether any set of facts are dependable upon which we can definitely state that lives will be saved, IF we add a month of daylight saving in the spring and fall.

In Massachusetts for the four years 1936-1939 the fatal accidents totaled as follows:

	1936	1937	1938	1939
Day Accidents	273	266	207	172
Night Accidents	499	477	372	397
	772	743	579	569

These figures show a general reduction in fatal accidents over the four years both day and night although the night fatal accidents are still over twice those occurring in the day time.

In the following tabulation the fatal accidents are shown by Hours of Occurrence and a definite upward trend up to 7 P. M. for the four years.

NUMBER OF FATAL ACCIDENTS IN MASSACHUSETTS
FOUR YEARS — 1936-1939

Hour of Occurrence	1936	1937	1938	1939
12 to 1 A.M.	69	48	40	36
1 to 2 A.M.	28	25	25	23
2 to 3 A.M.	20	22	9	12
3 to 4 A.M.	12	5	10	7
4 to 5 A.M.	4	11	5	7
5 to 6 A.M.	6	10	5	12
6 to 7 A.M.	9	12	15	9
7 to 8 A.M.	12	7	12	9
8 to 9 A.M.	11	15	11	6
9 to 10 A.M.	11	8	9	8
10 to 11 A.M.	16	16	13	10
11 to 12 Noon	19	21	17	25
12 to 1 P.M.	17	24	21	12
1 to 2 P.M.	17	22	21	18
2 to 3 P.M.	33	28	26	8
3 to 4 P.M.	35	33	17	20
4 to 5 P.M.	45	44	27	25
5 to 6 P.M.	65	76	45	59
6 to 7 P.M.	72	72	50	61
7 to 8 P.M.	69	52	58	47
8 to 9 P.M.	50	61	45	44
9 to 10 P.M.	44	47	30	33
10 to 11 P.M.	37	37	35	43
11 to 12 Midnight	71	47	33	35
TOTAL	772	743	579	569

It is obvious that a study of this exhibit shows that throughout the year fatal accidents rise sharply between 5 P. M. and 8 P. M. and the question of daylight saving is only a minor factor.

There are many reasons suggested by the authorities who have studied the results of several surveys among which is this interesting observation.

In many cities the police patrol day and night shift, change at 6:30 P. M. leaving the highways almost without police protection. Therefore, the motoring public soon learn of this fact and speed home taking more than the usual chances. Several cities have corrected this condition by staggering the change of the highway patrol starting from 4 P. M. and ending at 8 P. M. and arranging for the greatest number of the police patrol to be on duty during that period.

The point I wish to strongly establish is that law enforcement by the State and Local Police is the only effective way of reducing fatal accidents.

Another suggestion put forth by a survey was that, after a hard day's work, many operators are at a low physical condition to meet an emergency, therefore contributing to avoidable accidents. Of course, speed is the greatest factor contributing to fatal accidents. Another factor is inattention or dreaming at the wheel or a mind occupied with family worries, causing unnecessary rear end collisions often causing a fatal accident.

Another exhibit showing fatal accidents by day of occurrence is interesting from the standpoint of a remarkable uniformity in the totals for each day of the week for four years. There is a slight decrease each year with the exception of Sunday.

NUMBER OF FATAL ACCIDENTS IN MASSACHUSETTS
FOUR YEARS — 1936-1939

Day of Occurrence	1936	1937	1938	1939
Sunday	129	113	102	113
Monday	104	100	69	65
Tuesday	81	87	66	77
Wednesday	85	82	60	65
Thursday	99	93	78	79
Friday	113	102	88	81
Saturday	161	166	116	89
TOTAL	772	743	579	569

Another tabulation of the Fatalities by Months and Years for 1936 to 1939 shows a definite increase in the number of fatalities after the daylight saving time expires, that is October, November, and December.

It should be pointed out, however, that all policies for Automobile Liability Coverage expire on December 31 with the expiration of the registration plates, which can be interpreted to mean that if the weather of the last three months of each year continues to be open, that is without snow or ice, motor vehicles are operated throughout this period.

You will also note that the first four months of each year show fewer fatalities, due, to some extent, to the fact that over 200,000 motorists do not operate their motor vehicles until later in the year.

Registration on January 1 about 600,000.
Registration after January about 400,000.

This can be interpreted to mean that fatalities decrease during the winter months of January, February and March.

MASSACHUSETTS MOTOR VEHICLE FATALITIES
BY MONTHS AND YEARS COMPARED
CALENDAR YEARS 1936-37-38-39

Months	1936	1937	1938	1939
January	54	64	33	48
February	44	48	36	30
March	45	72	37	35
April	58	52	48	46
May	56	59	46	41
June	65	58	29	35
July	61	55	41	44
August	78	61	65	46
September	84	62	71	49
October	77	82	68	72
November	97	74	64	78
December	97	94	84	75
TOTAL	816	781	622	599

In concluding my thoughts on Mr. Mills' paper, I have reached the conclusion that daylight saving time plays a very small part in the fatality record.

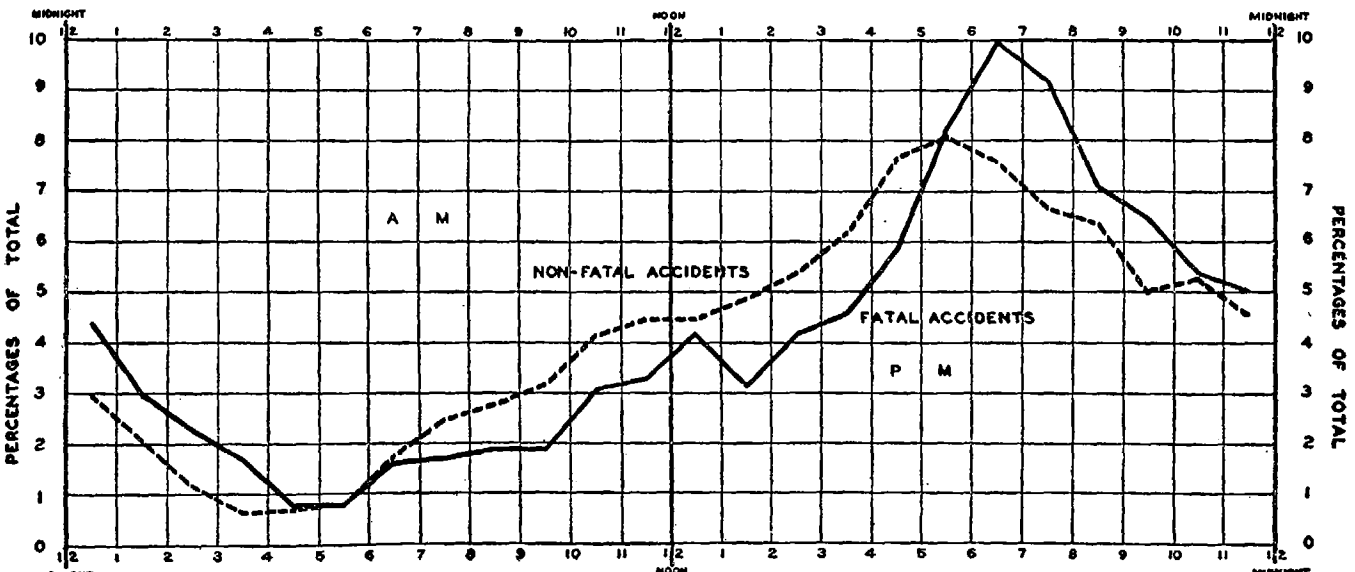
Attached hereto is a chart furnished me by the Department

MASSACHUSETTS

DISTRIBUTION THROUGH THE DAY

FATAL AND NON-FATAL ACCIDENTS

10 YEARS 1930-1939



of Public Works, Registry Division of the Commonwealth of Massachusetts which to me is remarkable.

The chart shows that for ten years the fatalities for winter and summer have a uniform distribution throughout the day, and all our accident prevention activities have not changed this apparently static record.

MR. RUSSELL P. GODDARD:

Mr. Mills has boldly attacked one of the most difficult problems that confront the insurance actuary—the handling of raw statistics. It is gratifying that his study is concerned with automobile accidents, which present one of the most interesting and mysterious fields that the statistician can explore. Automobile accidents, as we know, are caused by the presence on the highways of too many old cars with defective brakes, too many new cars with powerful motors, too many old drivers with slow reflexes, too many young drivers with no common sense, too many slow-pokes who get in the way, too many speed demons who try to pass them. Theories are plentiful and statistics are few. Out of this welter of confusion Mr. Mills brings us some actual facts about the accident records of cities using, or failing to use, daylight saving time.

Before discussing the effect of daylight saving time on automobile accidents, it may be pertinent to discuss the original reasons for the adoption of this device. Prior to 1883 standard time did not exist in this country and every important city used its own local time. Standard time was not legalized until March 19, 1918, when Congress directed the Interstate Commerce Commission to establish time zones for the country. The use of the same standard time for an entire zone naturally means that those cities in the eastern half of the zone will get an earlier sunrise and sunset than they would otherwise have. The opposite holds true for the cities in the western half of the zone, and the deviation from true sun time is as much as half an hour on the edges of the time belt. To correct for this deviation, cities in the eastern halves of these zones adopted daylight saving, and it is interesting to see that this was first adopted by New York City on March 19, 1918, the same day that the time zones were officially established. Practically all the cities which have since adopted daylight time have

been in the center or in the eastern half of a zone. Chicago, which would ordinarily use Central Standard Time, at one time put itself effectively on year-round daylight time by adopting Eastern Standard Time.

In determining accident frequencies, Mr. Mills has in general used the 1930 census as a base. In the three cities listed below, however, the populations given by Mr. Mills are somewhat different from those in either the 1930 or the 1940 census.

	Population (Mr. Mills' paper)	Population 1930 Census	Population 1940 Census
Kansas City	340,000	400,000	400,000
Los Angeles	2,208,000	1,238,000	1,497,000
Washington, D. C.	594,000	487,000	663,000

Possibly the differences in Los Angeles and Washington arise from the fact that some suburban areas have been included. This is particularly important in the case of Los Angeles which is the dominant city in the group not adopting daylight saving.

Type of City	City	Population	Number of Accidents in 24 Mos.	Monthly Average per 10,000,000 Pop.
Without D.S.T.	Baltimore	805,000	233	121
	Denver	288,000	121	175
	Kansas City	340,000	91	112
	Los Angeles	2,208,000	911	172
	Louisville	308,000	81	110
	Memphis	253,000	73	121
	Milwaukee	578,000	100	72
	St. Louis	822,000	163	82
	San Francisco	634,000	201	132
	Washington, D. C.	594,000	164	115
	Total Above	6,830,000	2,138	130
	Total Excl. Los Angeles	4,622,000	1,227	111
With D.S.T.	Chicago	3,376,000	1,298	160
	Newark	442,000	110	104
	New York	6,930,000	1,542	93
	Philadelphia	1,951,000	546	117
	Providence	253,000	26	43
	Rochester	328,000	71	90
	Total	13,280,000	3,593	113

It will be seen that Los Angeles had the highest accident frequency of all cities except Denver. With Los Angeles excluded, the cities on standard time had a slightly lower average accident

frequency than the cities on daylight time. There is also considerable variation among the cities in each group. This variation may be more apparent than real—the accident rates might be more consistent if some other base, such as the number of registered vehicles, could have been used instead of population. Unfortunately, it is practically impossible to obtain such figures.

One of the interesting facts brought out by Mr. Mills' investigation is that the cities using daylight time have a better accident record in both light and dark hours. Their superiority is particularly marked in the hours between 5 P. M. and 9 P. M. A possible explanation of this may be the relatively longer twilight in the northern latitudes where this particular group of daylight saving time cities is located.

The following table is based on the distribution by hour given in Appendix "B." The total number of accidents per 10,000,000 population was obtained by dividing 3593 by 1.328 and 2138 by .683.

Hour	Number of Months in Darkness		No. of Fatal Accidents per 10,000,000 Population		No. of Fatal Accidents (Sub Totals)		Number of Lives Saved in D.S.T. Cities	
	Without D.S.T.	With D.S.T.	Without D.S.T.	With D.S.T.	Without D.S.T.	With D.S.T.	No.	%
12 A.M. - 6 A.M.	24	24	529	525	529	525	4	.8
6 A.M. - 7 A.M.	4	4	47	60				
7 A.M. - 5 P.M.	0	0	880	814	927	874	53	5.7
5 P.M. - 6 P.M.	6	6	263	214				
6 P.M. - 7 P.M.	12	12	329	254	592	468	124	20.9
7 P.M. - 8 P.M.	20	14	369	212				
8 P.M. - 9 P.M.	24	20	257	196	626	408	218	35.0
9 P.M. - 12 P.M.	24	24	456	431	456	431	25	5.3
			3,130	2,706	3,130	2,706	424	13.5

It will be seen that the daylight time cities had 20.9% fewer accidents in the hours between 5 and 7 P. M., in spite of the fact that the same light conditions obtain in these hours in cities not using daylight time. In the hours from 7 P. M. to 9 P. M., which under certain conditions may be light in one city and dark in another, the cities using daylight time were 35.0% better. This is the only period of the day, except the early morning, which is affected by daylight saving.

Mr. Mills has given us the accident rates for these hours in the

daylight saving cities, and it is possible to make a rough conjecture as to the number of additional accidents which would have occurred in these cities if daylight saving had not been in effect. This is done in the following table by multiplying the accident rates by the number of light or dark hours in the 24 months covered by the survey.

	Average No. of Fatal Acc. per Mo. per 10,000,000 Population		No. of Months to Which Rates Apply (Using D.S.T.)		Estimated Number of Accidents in 24 Months per 10,000,000 Population		
	D.S.T. Cities						
	Light	Dark	Light	Dark	Light	Dark	Total
	(1)	(2)	(3)	(4)	(1) × (3)	(2) × (4)	
7 - 8 P.M.	4.4	12.0	10	14	44	168	212
8 - 9 P.M.	4.0	9.0	4	20	16	180	196
							408

	No. of Months to Which Rates Apply (Not Using D.S.T.)		Estimated Number of Accidents in 24 Months per 10,000,000 Population		
	Light	Dark	Light	Dark	Total
	(5)	(6)	(1) × (5)	(2) × (6)	
	4	20	18	240	258
	..	24	..	216	216
					474

From this it would appear that these cities had saved approximately 66 lives, roughly 2.5% of the total, by the adoption of daylight saving. If we exclude the effect of daylight saving, the accident rate of these cities would still be more than 11% better than that of the other cities.

Most of the figures given in Mr. Mills' paper show the average accident rate per hour regardless of traffic volume. In Appendices "B" and "C," however, the estimated volume by hour is given, and it is possible to calculate the number of accidents per month if either day or night conditions prevailed all the time. In Appendix "B" the estimated traffic volume in the 18 hours from 6 A. M. to midnight is 92.9% of the day's total. In cities without daylight time, 64.4% of the total traffic occurs in daylight and 28.5% in the dark hours before midnight. These facts are used in the following table, based on the results in the cities not using standard time.

	Light Hours	Dark Hours (excl. 12 to 6 A.M.)
(1) Fatal Accidents in 24 Months....	776	1,000
(2) No. of Accidents on basis of 10,000,000 Population (1) ÷ .683	1,136	1,464
(3) Average Number of Accidents per Month.....	47.3	61.0
(4) Percent of Traffic Volume.....	64.4	28.5
(5) Average Number of Accidents per Month under conditions of lightness or darkness (3) ÷ (4).	73.5	214.3

We therefore see that these cities would have had 73.5 accidents per month if darkness did not exist, and 214.3 accidents if the sun never shone again. This gives a slightly different interpretation to the figures used in Appendix "C."

It is rather surprising at first to find that the decrease in motor vehicle fatalities resulting from daylight saving time is so small. However, Mr. Mills has shown that this device produces relatively little increase in effective daylight over a full year period. In a 24 month period, disregarding the hours from midnight to six o'clock, there are 294 hours of daylight and 138 hours of darkness as compared with 304 hours of daylight and 128 hours of darkness if an hour of daylight is added in the five summer months. The adoption of daylight saving time increases the proportion of daylight from 68.1% to 70.4%. Such an increase in daylight can produce a decrease in automobile accidents of approximately 2.5% if the accident frequency in daylight is, as Mr. Mills has demonstrated, about one-third of the frequency at night.

MR. J. MALMUTH:

Mr. Mills has presented a timely paper.

Close to 40,000 fatalities and over 1,000,000 accidents a year is the current price exacted by the motor vehicle. These figures are tragic evidence of the need for ever-increasing endeavor and diligence to discover and act on ways and means of reducing them.

The automobile industry has helped by turning out cars sturdier in construction, better equipped mechanically and easier to control. Tires have been made safer. Automobile glass has been made shatterproof.

The federal, state and municipal governments have helped by the thoughtful planning and building of excellent roads, bridges and tunnels, the efficient maintenance of these instrumentalities of traffic, the elimination of railroad crossings, the installation and improvement of mechanical methods of traffic control, and educational campaigns in the schools and generally. Driving courses are included in the curricula of many schools and colleges throughout the country. Licensing tests are more strict and more comprehensive. In some states provision is made for periodical inspections of cars for defects. In many states financial responsibility laws have been enacted which by their requirement that evidence of financial responsibility be furnished in certain situations, may be considered as tending to encourage safe driving.

Insurance companies, life, accident and casualty, have not been standing idly by. They spend substantial sums every year preaching by means of the cinema, the radio and the printed word, the gospel of careful and safe driving. The casualty companies have adopted merit rating plans which encourage careful driving by providing savings in insurance costs to accident-free car owners.

Mr. Mills makes a very constructive suggestion. Some readers of his paper may contend that he has not given proper consideration to or has not correctly evaluated all the factors which have a bearing on the question. For example, Mr. Mills points out that fatal accidents during each of the hours from 5 P. M. to 9 P. M. are roughly three times more numerous during months in which the hour is dark than during months in which it is light. It may be reasonably argued that it is not proper to attribute this fact entirely to the darkness of the hour and that the weather during the period when these hours are dark accounts in part for the more adverse experience. But, on the whole, Mr. Mills has presented a convincing case. Supporting evidence is found in the monthly and annual reports published by the New York Commissioner of Motor Vehicles. An analysis of accidents reported to the Bureau of Motor Vehicles for 1939 shows 562 fatalities for the eight hour period 8 A. M. to 4 P. M., compared to 1,076 fatalities for the eight hour period 4 P. M. to 12 P. M. The analysis also shows that 905 fatalities occurred in daylight and 1,206 fatalities at night. An analysis by conditions of vehicles involved in accidents shows 57 fatalities due to glaring headlights, 20

fatalities due to one or both headlights out and 19 fatalities due to tail-light out or obscured, all items peculiar to night driving. The Commissioner in commenting on the 1939 record said, in part, as follows:

> "As usual the hours of darkness were responsible for the most fatal accidents."

Although Mr. Mills has confined his paper to the matter of automobile fatalities, I believe a study undertaken to cover the field of industrial accidents would show that where in effect daylight saving has been responsible for a marked decrease in the accident frequency and the number of serious injuries. It is a well established fact that the last working hour of the day is the time of greatest fatigue and if at such time the worker has a daylight hour instead of an hour of artificial light, the hazard of eyestrain and fatigue is lessened, thereby reducing the risk to accident.

The original proponents of daylight saving in this country suggested putting it into effect on an all year round basis. Mr. Mills gives two reasons against it. Although it may not be feasible to establish it for the entire year, it does seem feasible to extend it so that it will include the months of March and October. One of the reasons advanced by Mr. Mills against an all year application is that a large volume of traffic moves during the hour from 7 A. M. to 8 A. M. and this traffic would be forced to move in darkness during the winter. From the chart which is part of Appendix "B" it appears that during March and October, with daylight saving, this would be an hour of daylight. Some idea of the benefit that would accrue from an additional hour's daylight during the month of October particularly can be gathered from the following remarks by the New York Commissioner of Motor Vehicles in his report for 1939:

> "October was the most dangerous month of the year, for 296 fatalities occurred during that period. This month or December generally leads in recording the most motor vehicle deaths."
>
> "The hour of greatest peril was from 6 P. M. to 7 P. M., for during that period 175 fatal accidents occurred. The hour from 7 P. M. to 8 P. M. usually had this dubious distinction."

AUTHOR'S REVIEW OF DISCUSSIONS

MR. JOHN A. MILLS:

The five reviews of this paper show the widespread interest of members of this Society in accident prevention and particularly in the part that statistics can play in bringing about a better nationwide motor vehicle fatality record. It is gratifying that the reviews, in the main are favorable to the conclusion reached by the author, namely, that the more general adoption of daylight saving time would save lives.

Mr. Bailey suggested that a different approach might have been used, namely that of comparing the Summer with the Winter record for daylight and non-daylight saving cities respectively. This basis of comparison was considered but it was not adopted because all of the daylight saving cities are in the North, whereas many of the non-daylight saving cities are in the South. Weather conditions are reasonably similar between the North and the South during the Summer whereas they are not similar during the Winter. In other words, we would be comparing a period of considerable snow and ice with Summer conditions in the case of daylight saving cities but a period of little snow and ice with Summer conditions in the case of non-daylight saving cities. Another factor that tends to invalidate the suggested basis of comparison is the movement of people from the North to the South in Winter and from the South to the North in Summer.

The comparison made by Mr. Bailey of the Winter record of daylight and non-daylight saving cities is distorted by variations in weather conditions and in the hourly volume of traffic between Northern and Southern cities. That weather conditions affect not only the accident hazard per mile but also the hourly distribution of traffic mileage is evidenced by statistics of traffic volumes compiled by the U. S. Bureau of Public Roads. These statistics show that during the Summer months 28.7% of the day's traffic moves between 10 A. M. and 3 P. M., and 20.9% between 6 P. M. and 10 P. M. During the Winter months 31.9% of the day's traffic moves between 10 A. M. and 3 P. M. whereas only 16.8% moves between 6 P. M. and 10 P. M. This shift in traffic is particularly noticeable in colder climates.

The possibility that the saving of lives in cities adopting daylight saving time would be offset by an increase in fatal accidents

in neighboring areas is rather difficult to measure on the basis of available statistics. However, the meager information that is available indicates that the increase in neighboring areas would not be important. We compared the fatal accident record of New Jersey and New Hampshire, which have exclusively daylight saving time with the fatal accident record of Maryland and North Carolina, which have exclusively standard time, and found that the indicated saving was in line with that shown in the comparison of city data.

AVERAGE NUMBER OF FATAL ACCIDENTS PER MONTH PER 10,000,000 POPULATION

(Five Summer Months)

	States Without Daylight Saving Time	States With Daylight Saving Time
10 A.M. - 3 P.M.	26.9	28.7
6 P.M. - 10 P.M.	48.6	41.6
Increase	21.7	12.9
Percent of Increase	80.7%	44.9%

New York State was referred to by Mr. Bailey in connection with this point, but since this state uses both daylight and standard time, its record is not as indicative as a comparison of states having exclusively daylight saving time with states having exclusively standard time.

Aside from the statistics we have presented, there appear to be valid reasons to believe that the indicated reduction in fatalities in the cities would not be offset by a comparable increase in the surrounding areas. To begin with, country driving is not as hazardous as city driving and consequently a shift of mileage to less hazardous roads should be a switch for the better. Furthermore, accident records show that 72% of the fatal accidents occurring in cities after dark involve pedestrians whereas only 32% of the fatal accidents occurring outside of cities after dark involve pedestrians. The high pedestrian motor vehicle mortality rate in cities after dark is due to the combination of poor visibility and the number of pedestrians exposed. Since there are fewer pedestrians exposed in the country than in the city it seems logical to reason that a shift of travel away from cities would be beneficial.

Mr. Goddard questioned certain of the population figures used in the study. The Washington, D. C., population that was used represented an estimate for the year 1937. A later date was used for this city because of its tremendous growth during the past decade. The Los Angeles figure includes the suburbs, and the Kansas City figure should have been given as 400,000. It perhaps should be pointed out in this connection that revising the population figures has no bearing on the comparisons as made or on the conclusions that were drawn for the reason that the number of accidents in the evening hours in relation to the number of accidents during the chosen daylight hours comprise the essential elements in the comparison.

The better accident record per unit of population of the daylight saving cities during all hours and not just during the hours affected by daylight saving is largely due to the lower than average ratio of motor vehicles to population in the case of New York City. In determining the saving of lives under daylight saving time, comparisons were made between different hours in the same cities and not between the two groups of cities so that any advantage held by the daylight saving cities as a result of their better accident record was eliminated.

The evening hours of 6 P. M. to 10 P. M. were chosen so as to eliminate the influence (insofar as possible) of the change in traffic volumes from hour to hour caused by varying light conditions. Because of twilight[1], daylight saving affects light conditions to some extent between 9 P. M. and 10 P. M. during June and July, and between 6 P. M. and 7 P. M. during September.

Mr. Malmuth suggested the desirability of extending daylight saving time to the months of March and October. The extension probably would reduce fatal accidents but we did not include these two months because a part of the hour from 7 A. M. to 8 A. M. would be dark in these months. In our study morning darkness is assumed to end thirty minutes before the sun is actually above the horizon. A smoky or foggy morning in March or October might cause dangerously dark driving conditions for an hour or more beyond the assumed time line.

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[1] Information from widely scattered weather bureaus indicates that the length of civil twilight (sun 6° below horizon) varies about ten minutes among various localities. This variance is too small to have any appreciable effect on the data.

The question was raised by several reviewers as to the effect which such factors as law enforcement, speed, inattention, liquor and fatigue have on the accident record. These factors are present in both the daylight saving and non-daylight saving cities and while they do cause accidents the limitations of available statistical data made it necessary for us to assume that their influence in the two groups of cities was about the same.

In the final analysis the conclusion that daylight saving time will save lives rests on the fact that the automobile accident fatality rate is greater per mile during darkness than during light and that the factor of visibility is an important determining factor in the difference. Since the fatal accident rate per mile of travel is known to be about three times as high during the night as during the day, it appears reasonable to conclude that each mile of travel shifted from dark to light will bring with it a reduction in the over-all fatality rate.

REVIEWS OF PUBLICATIONS

CLARENCE A. KULP, BOOK REVIEW EDITOR.

Accident Investigation Manual. The Northwestern University Traffic Institute, Evanston, 1940. Pp. viii, 231.

The objective of this study is to give policemen, particularly those in traffic and allied lines, a comprehensive picture of their obligations and method of procedure in all of their various contacts with automobile accidents. The book very definitely accomplishes its purpose in that any police officer who carefully reads the book will certainly be both a better investigator of a traffic accident and a more effective emergency administrator on the scene of the accident.

The authors must have had a somewhat difficult job in the simplification of the subject. The book must of necessity deal with a technical subject and yet, considering those for whom it is designed, had to be written so that it could be easily understood. Fortunately this analysis, despite its technical aspects, is so clearly written that no one interested in the subject can fail to gain a very clear understanding. Even to the laymen in the field, it is an interesting book and with its so-called case histories or examples holds the reader's attention regardless of his motive for reading.

The book covers the field of automobile accidents, their cause and preventive possibilities. It includes an excellent summary of the criminal law and its relationship to automobile accidents. It very ingeniously gives mathematical formulas for reconstructing an accident by figuring the speed of the automobile by pavement skid marks. It covers in especially interesting graphic fashion the place of photography in the investigation of automobile accidents and has some especially pertinent pictures on the perspective of the same scene as shown by different photographs. The book also includes a manual on the conduct of the officer investigating the accident, giving him many suggestions which, if followed out, would temper the effect of many an accident.

From the selfish standpoint of those of us in the insurance business (and after all everyone reads every book with an element of self interest) this survey can be very helpful. Certainly to

those who are in the claim departments, in an investigating or even a clerical capacity, it opens up new avenues of thought and crystalizes the procedure of investigation. The claim man should purchase this book, read it and have it as a permanent reference. The underwriter could use it to advantage and even the agent selling automobile insurance can gain necessary general knowledge from the manual.

ARMAND SOMMER.

Safety Education: Eighteenth Yearbook, American Association of School Administrators. The Association, Washington, 1940. Pp. 544.

Casualty actuaries, most of whose problems are so greatly affected by the changing conditions of accident causation, should be and I think are greatly interested in any movement for safety education as tending to diminish the frequency and severity of accidents of whatever kind. A movement likely to be effective in reducing all forms of accident calls for our special notice. The present volume deals with just that.

It seems that the Association of School Administrators selects some special subject as the central topic of its yearbook each year. In April 1937 the executive committee selected safety education for the 1940 book and a special Commission on Safety Education was appointed to prepare the report on which one of our members, Albert W. Whitney, served. The report and its exhibits and appendices cover 406 pages of the volume, the remainder being taken up with official records.

There is a prefatory letter from Admiral Byrd sending a "safety message to the millions of American school children" from which the following quotation is taken as indicating a basis of appeal for safety to the spirit of youth:

> I want them all to know that in all my travels and adventures in the interests of science and discovery I have never taken an *unnecessary risk*. Only the best and safest equipment was selected for planes and ships. Everything was safe that could be made safe.
>
> By careful planning and by taking no unnecessary chances my men and I have lived to enjoy the hazards and thrills of adventure and discovery. We found adventure only by planning for safety as far as possible.

The body of the study comprises 12 chapters as follows:

I. The Safety Problem and Its Relation to Education
II. Accidents and Safety—The Factual Background
III. School Participation and Organization
IV. Programs in the Elementary School
V. Programs in the Secondary School
VI. Driver Education and Driver Training in the Secondary School
VII. Safety Programs in Rural Schools
VIII. Safety Education for Adults
IX. Preparation of Teaching Personnel
X. Safety under School Jurisdiction
XI. Safety Requirements in Locating, Planning and Equipping School Buildings
XII. Coordination of Safety Education Programs

Each chapter is a carefully worked-out discussion of a topic with references to related safety programs and other appropriate material.

Following this discussion under the title, *A Point of View on Safety Education,* is what appears to be the conclusion of the Commission, a series of 15 propositions with a brief supporting paragraph on each. These propositions, noted below, seem to this reviewer sound, and worthy of support by casualty companies:

1. Experience shows that many accidents are preventable through a program of education.
2. Instruction in safety is an essential part of the modern school's program of producing good citizens.
3. The determination of the character and the extent of the school safety program and the selection of teaching methods to be used are professional responsibilities of educators.
4. Rural schools, operating under numerous conditions spefically different from those of urban schools, should make an effort to adjust their safety programs to the special conditions of their environment.
5. Safety education for adults is a primary responsibility of the community and the state.
6. In each community it is the responsibility of the board of education and its executive staff to build and to maintain school buildings which are safe.

7. Responsibility for areas of safety education not designated specifically by law should be assigned by agreement to the agency or agencies most competent to achieve the desired goal.
8. Teaching youth to be safe and intelligent operators of motor cars is a responsibility of the community.
9. The school has a responsibility for systematic instruction in all aspects of safety.
10. School systems embracing several schools should organize safety coordinating agencies.
11. A formal or informal safety council or committee, or other liaison among safety agencies, should be established in every community.
12. In their efforts to advance the safety movement educators should recognize the need for appraisal and research.
13. It is remarkable how much can be accomplished if no one is too anxious about who receives credit.
14. Effective programs of safety education should be adequately financed.
15. The time has come for educators to prepare themselves for leadership in safety education.

Following these conclusions is a selected, topically arranged bibliography covering 12 pages and an appendix in 3 sections:

I. Where Safety Aids May Be Obtained
II. Sources of Reviews of Safety Films
III. Accident Reporting

A. H. MOWBRAY.

Industrial Health—Asset or Liability, C. O. Sappington. Industrial Commentaries, Chicago, 1939. Pp. 306.

It is said that it takes from 8 to 15 industrial workers to successfully keep a soldier at war. Certainly Dr. Sappington's book could not have been published at a more propitious time. In peace times enlightened industry long since has come to realize that a sound industrial health program is a real asset. In times of emergency the whole people becomes impressed with the fact that man-power must be conserved. Dr. Sappington, fortunately in language easily understood by the layman, has in his book demonstrated in a forceful manner that industrial health is indeed an asset. To a great extent his arguments are from the

standpoint of dollars and cents rather than purely from the standpoint of humanity. He points out impressively that losses resulting from sickness in industry, as distinguished from industrial accidents and occupational diseases, are almost unbelievable and greatly exceed the cost in dollars of industrial sickness.

The book should be very useful to the small manufacturer or industrialist and in it Dr. Sappington outlines for just that particular class of employers the fundamentals of a sound health service. The book should be of great use also to the health authorities of the states among which, at this time, we find only 31 having industrial hygiene facilities. It can very well become a text book for the plant doctor and the industrial nurse.

Surely industrial health work does count and Dr. Sappington demonstrates it.

ALBERT W. WHITNEY.

Silicosis. Studies and Reports, Series F (Industrial Hygiene), No. 17. International Labour Office, Geneva, 1940. Pp. iv, 223.

This is a most interesting account of the proceedings of the Second International Conference on Silicosis held in 1938 in Geneva, under the auspices of the International Labour Office. Experts of international reputation from 10 countries participated in the Conference and the report of their views is of importance to anyone interested in this subject. A number of the papers delivered before the Conference are contained in an appendix, while the report itself includes detailed summaries of the discussion and of papers not published in full.

The agenda of the Conference consisted of the following:

1. Recent advances in the knowledge of the pathology of silicosis, including the effect if any of the admixture of non-siliceous dusts with silica or silicates.
2. Pneumoconiosis of workers exposed to coal dust.
3. Pulmonary disease due to inhalation of dust other than those covered by 1 and 2.
4. Methods and standards of early diagnosis of pneumoconiosis and value if any of early diagnosis of simple silicosis in regard to removal from dusty occupations with a view to the arrest of the disease.

5. (a) New methods of dust investigation as regards sampling, concentration, etc.
   (b) Intensity of exposure to dust and means of estimating it.
   (c) Possibility of establishing experimental criteria for determining the degree of pathogenicity of dust.
6. Contributions from other scientific fields essential to the solution of the pneumoconiosis problem.
7. Determination of disability and degree thereof.
8. Prevention: (a) Initial examinations; (b) Campaign against dust; (c) Personal protection (by means of masks, etc.).
9. Specific therapy of silicosis and results of investigations into methods for stimulating elimination of silica.
10. Means by which the Subcommittee can assist in the anti-dust campaign.

ALBERT W. WHITNEY.

Applied Fire Insurance, H. Thompson Stock. Thompson Stock Publishing Co., Detroit, 1939. 2 Vols. Pp. (continuous) 263.

The key to this book by a partner in the Arthur J. Stock Insurance Agency (also Treasurer of the Detroit Association of Insurance Agents, Contributing Editor of *Local Agent* and Insurance Lecturer, Wayne University) is found in the note on the third preliminary page following a list of collateral reading assignments. "This book is intended to be more practical than the usual first insurance text. For this reason it embodies rules and practices that apply in Michigan . . ." In the note might well have been inserted after the word "practical," the words: "for the local agent, particularly a local agent representing primarily stock fire insurance companies." The same note suggests the student in Michigan should study with the book "the rule book, the Michigan standard policy and all forms and endorsements mentioned" and that readers in other states do likewise with local material, noting differences from the Michigan forms and practices quoted in the text.

Considering its purpose it is a pretty good job, though the lack of an index, due to the manner of publication, detracts somewhat.

As is natural the book deals rather dogmatically with many

things. Such expressions as "the rules require" (without any discussion of why they do or should); "it is necessary to consult the rule book"; appear rather frequently.

As might be anticipated there is much description of forms and citation of current rules and practices which are likely to become outmoded at any time.

Each chapter (there are 30 in all) is followed by numerous questions and problems of the type likely to occur in a local agent's daily work.

It would appear that the chief interest of casualty actuaries in this book would be its service as a guide to the sort of instruction local agents want, if this had not been made abundantly plain to them in other ways.

A. H. MOWBRAY.

Fire Insurance Underwriting, Prentiss B. Reed. McGraw-Hill Book Co., New York, N. Y., 1940. Pp. ix, 380.

As explained by the author in the preface, this book had its origin in the scholarship course formerly maintained by the fire insurance companies at Columbia University. The point of view is partly indicated by the definition, "Underwriting is a combination of producing and selecting business, and distributing amount at risk." Also, "Readers are assumed to have some general knowledge of risks, policies, fire losses, rating methods, the workings of agency and brokerage offices, and company operations." To this reviewer it seems that the extent of existing knowledge assumed is rather uneven, some rather simple matters being quite fully explained and others less obvious rather briefly treated. To this reviewer, accustomed to think of underwriting and agency operations as distinct and at times antagonistic, the inclusion of "production" as a part of underwriting is a bit disconcerting.

The point of view is primarily that of a proprietary company and assumes that self-interest, the profit motive, is the mainspring in all decisions. The tendency at times is to accept conditions as they are without reference to their origin, their justification or the responsibility for their maintenance. Thus "it is probable that, to be adequate, a rate scale must produce over a period of years a loss ratio of not more than 40 per cent" (p. 190). Why should it take 150 per cent of the amount distributed in losses to

make the distribution? Again, "Underwriting rules prescribe that on certain classes, generally mercantile and manufacturing, no policy shall be issued for a longer term than one year but that on other classes, notably dwellings, churches and schools, mercantile buildings, and sprinklered risks, policies may be issued for three or for five years" (p. 208). Whose rules? Why do they so provide?

There are 14 chapters and 13 appendices with a brief but good bibliography. Under the title *Organization and Operation* is presented a good description of the field set-up in fire insurance and its relation to the rest of the company. Then follows a description of *Production, Selection, Retention* and *Distribution Methods and Procedure* as practiced in fire insurance.

Under the caption *Policies and Possibilities* is presented the present New York Standard policy with explanatory comment on each provision.

The chapter on *Causes and Effects of Fires* does not seem to this reviewer adequate. The list of causes of the National Book is given in order of importance but nothing is presented that seems calculated to assist the underwriter in appraising any given risk as respects these causes. There are tables of aggregate losses by years and some frequency tables by size of loss but not enough explanatory matter to make them useful.

The chapters on *Adjusting and Paying Losses* and on *Class and Risk* seem the best. In the latter there is considerable material which should enable an underwriter who gives it careful study to do a better job.

Some very interesting material is presented in the appendices, including among other items a copy of the proposed revision of the New York Standard Fire Policy, a copy of an agency agreement and comments by Alfred M. Best on *Sound and Unsound Underwriting Theories.*

A. H. MOWBRAY.

101 Unusual Classes of Risks, M. E. Bulske. The Rough Notes Co., Inc., Indianapolis, 1939. Pp. 271.

In the author's previous book, *Practical Underwriter's Guide,* a description was given of 24 groups of risks and the characteristics of each were discussed from an underwriting and inspection stand-

point. The present volume is supplemental in nature and affords a similar review of a much larger number of risks. Many of these classes are unique because of unusual processes, great hazard or very recent development. Some of the risks are infrequently written and accordingly little information has hitherto been available.

Each of the 101 chapters deals with a separate class. Some descriptions are naturally quite brief while others cover several pages. Some of the chapter headings taken at random are:

Airplane Hangars
Aluminum Powder Factories
Broom Manufacturing
Celluloid Workers
Chemical Plants
Dowmetal Machining
Fireworks Factories
Greenhouses
Salt Manufacturing
Turpentine Plants

Fire insurance underwriters, agents and inspectors who have made use of the author's original book will welcome the appearance of this second volume.

H. O. VAN TUYL.

Commentaries on the Revised Insurance Law of New York, Abraham Kaplan and George I. Gross. Grosby Press, New York, 1940. Pp. xix, 719.

The title of this book is considerably broader than its actual content. The Revised Insurance Law of New York has 18 titles, or, if the subtitles of Title IX and Title XI are counted, 23. The commentary covers 4 of these in full: Article I: *Definitions; Penalties;* Article II: *Organization of Insurance Department;* Article III: *Administrative and Procedural Provisions;* and Article VIII: *Rates and Rating Organizations.* Five others are covered in part: Article IV: *Organization, Licensing and Corporate Procedure of Insurers;* Article V: *Assets; Investments and Deposits;* Article VI: *Agents, Brokers and Adjusters;* Article VII: *The Insurance Contract;* and Article XI-A: *Stock and Mutual Fire and Marine Insurance Companies.* The rest are omitted in their entirety:

Article IX-A: *Life, Accident and Health Insurance Companies and Retirement Systems.*

Article IX-B:	*Cooperative Life and Accident Insurance Companies.*
Article IX-C:	*Non-Profit Mutual Indemnity or Hospital Service Corporations.*
	(IX-D: *Savings Bank Life Insurance,* has been redesignated as part of the banking law).
Article IX-E:	*Unclaimed Funds of Domestic Life Insurance Corporations.*
Article X:	*Casualty Insurance and Surety Companies.*
Article XI-B:	*Cooperative Fire and Windstorm Insurance Companies.*
Article XI-C:	*Companies for Insurance of Life of Property.*
Article XII:	*Reciprocal Insurers and Lloyds Underwriters.*
Article XIII:	*Title Insurance Corporations.*
Article XIV:	*Fraternal Benefit Societies.*
Article XV:	*Merger, Consolidation and Conversion of Insurers.*
Article XVI:	*Rehabilitation, Liquidation, Conservation and Dissolution of Delinquent Insurers.*
Article XVII:	*Taxes and Fees.*
Article XVIII:	*Laws Repealed; Time of Taking Effect.*

There is no objection of course to a book covering a part of a subject only, but the fact that it covers but a part is not indicated by the book's title.

In the Introduction, the authors state that they have attempted to present "An analytical and comprehensive treatise on those portions of the New York Code which deal generally with all types of insurers, agents and brokers and those pertaining specifically to the business of fire and marine insurers." The general plan of the exclusions is to cut out:

(a) sections pertaining specifically to life, accident and health insurance companies and their agents.

(b) sections pertaining specifically to casualty and surety insurance companies and their agents.

(c) sections pertaining specifically to mutual insurance carriers.

(d) sections pertaining specifically to reciprocal exchanges and Lloyds Underwriters.

This makes it practically a book written for stock fire and marine insurance interests, and the dedication, "To the Fire and Marine Insurance Fraternity" would seem, in view of these exclusions, to imply that where mutuals, reciprocals and Lloyds associations come into the picture, the fraternal spirit ceases. It may be noted, moreover, that section 150, relating to warranties and Articles XV, XVI and XVII, all of which are omitted, are general in scope.

The limited character of the book's contents makes it less useful to the lawyer than the annotated editions of the Code, but it is clearly indicated in the introduction that the book is written primarily for insurance laymen and not for the Levites of the law.

Having said so much, one should hasten to add that it is one of the most interesting books of the kind that the reviewer has seen. The commentaries are clear, well-written and pertinent. The coverage while limited includes some extremely important sections of the insurance law, and certain of the commentaries are exhaustive and valuable, and interesting not merely to one of the fire and marine insurance fraternity. The further the authors go the more their commentaries gain in interest. Any insurer might read with profit the commentaries on Articles I-VIII. But the cream of the book, the part that is fullest and most interesting, are the commentaries and appendices dealing with the fire insurance business, and with the pregnant topic of inland marine insurance.

This last topic is one of the most picturesque developments of modern underwriting, reminiscent of the days when certain surety underwriters were voicing the opinion that a surety company could write any insurance risk whatever provided the insuring instrument could be tortured into the form of a bond. Marine insurance is the oldest of insurance lines, and the ocean marine field was so far international that the regulatory hand of the states let it very much alone, exempting it generally from legislation concerning policy forms and rate regulation and permitting ample and comprehensive coverage. These advantages were extended without protest to inland marine and transportation insurance, and by an easy transition, to lines of insurance more and more remotely connected with transportation, making successful invasion of fields heretofore covered by fire and casualty companies and exploiting their breadth of underwriting powers and freedom from regula-

tion. In due course this brought the marine companies into collision not merely with other companies but with supervisory officials as well. A nation-wide definition of the insuring powers of marine and transportation underwriters was ultimately adopted in 1933 by the National Convention of Insurance Commissioners and a Committee on Interpretation and Complaint was set up to administer the definition. This book gives much of the detail of this matter. Appendix A-1 gives the Definition; Appendix A-2 the text of interpretive rulings; and, most welcome of all, Appendix A-6 gives the text of the opinion of Judge Reis in the case of *Northwestern National Insurance Company* v. *Mortensen*: a delightfully written commentary on the true meaning of marine insurance. "*Omnibus,* however," says the judge, "is not synonymous with *marine.* Elephant is not synonymous with turtle."

It may be said that the Definition, and the interpretive rulings made thereunder, do not set a line of cleavage entirely clear-cut and natural. There is some attempt to adhere to the principle that marine insurance is properly an insurance proximately connected with transportation. But this distinctly is not and probably could not be consistently and rigidly followed. A pragmatic solution is often the only solution to a vexed and controversial matter, and the efforts made seem to have been successful in restoring a degree of harmony and mutual understanding.

This one topic entitles the book to a reading; on many other points it may be read with profit, and with a pleasure enhanced by the book's very attractive appearance. Its cover alone makes it an ornament to a bookshelf, and the format is exceptionally well-conceived and well-executed. The device of printing the statutes in small type, the commentaries in much larger type, enables the eye to make the distinction readily and emphasizes the fact that the commentaries and not the statutory reproductions are the book's reason for being. The authors and the printer alike are to be commended for an achievement very well worth while and it is to be hoped that the entire Code will in due course be adequately covered.

CLARENCE W. HOBBS.

Profit-Sharing and Pension Plans, C. Morton Winslow and K. Raymond Clark. Commerce Clearing House, Inc., Chicago, 1939. Pp. xiii, 192.

In a foreword the authors state that this book is intended as an aid in the creation of pension and profit-sharing plans and that they believe it is also "the first complete analysis and summary of all authoritative material dealing with the effect of federal tax laws upon such plans." The book is divided into two sections under the headings *Practical Planning and Tax Economies* and *Legal Phases of Tax Factors.* The first section reviews opinions as to the value of profit-sharing, discusses the relative values of immediate and deferred distribution of shares in profits, outlines and comments on plans for deferred distribution and reviews a number of plans in operation. The second section presents historically the development of the present status of tax exemptions with respect to employer contributions to employee trusts connected with deferred profit-sharing and pension plans and states with comments the present requirements of and allowances in federal legislation and rulings. This part of the book should prove to be very valuable to anyone trying to orient himself in this field as well as to those who want an assembled presentation of federal requirements.

The first section of the book reviews the findings of a subcommittee of the Senate Committee on Finance following its study of a large number of profit-sharing plans and states the conclusions of studies under other auspices.

While a large majority of profit-sharing plans at present make distributions immediately in cash, it seems that the majority of canvassed opinion among both employers and employees favors deferred distribution plans. A chapter is devoted to a discussion of this point. With respect to deferred distribution profit-sharing plans, there seems to be a confusion of ideas in that plans requiring contributions from members are labeled profit-sharing. Doubtless this is accurate with respect to employer contributions, but it is not clear why these words alone should be used to designate plans involving member contributions.

Without question many advantages of profit-sharing plans are qualitative rather than quantitative and must remain so. This applies in the discussion of the relative merits of immediate and

deferred payment plans as well as the virtues of profit-sharing plans in general. But some elements in the discussion are clearly quantitative, and among these is that of savings in taxes to the employer and employees. To the reviewer it seems that the discussion is not as sharp as it might be in this respect. The authors seem to confuse the burdensomeness of certain taxing laws and rulings with the subject really under discussion: the incidence of tax burdens or exemptions on profit-sharing plans. For instance the first chart in the book shows in a striking manner the outcome of a tax rule that requires taxes on profits for one year but makes no allowance for a loss during the next year. There is perhaps a crying need for correction here, but the discussion does not make clear why a change would make profit-sharing plans more valuable to the employer. Under the present rulings the statement of the authors is doubtless correct that anything that "tends to level off the income of a taxpayer is advantageous," but they do not show how losses would be reduced by spending more for profit-sharing plans. It is obvious without this chart that the establishment of unemployment benefit plans would be encouraged by a rule that employer payments toward such a plan constitute an "ordinary and necessary business expense"; but it is not clear that the chart aids in establishing this point.

Again the thesis of Chapter III is that through contributions to profit-sharing plans a corporate employer may reduce various taxes in such a way as to have a larger remainder for stockholders or their heirs. While the figures for Chart 3 may be "startling to anyone who has not considered them in sequence and in their total ultimate effect," they do not establish that the stockholders or heirs would be better off if profit-sharing plans were in the picture. To show this the authors might have paralleled the figures and the corresponding charts with and without the presence of a particular profit-sharing plan. As it stands the reviewer is impressed with Chapter III as a complaint against present high taxes—this impression is intensified by the last paragraph of the chapter—rather than as a demonstration that profit-sharing plans would improve the situation.

Chapter IV outlines a joint contributory deferred distribution profit-sharing program proposed by the Senate Committee mentioned above and discusses the provisions proposed. This chapter

should be very valuable to anyone who has the responsibility of formulating proposals along this line. A thorough discussion here of these details is out of the question but a few points are of unusual interest. The plan suggested is expected to furnish a retirement benefit, an unemployment benefit and a device for saving with loan privileges.

The Senate Committee plan suggests the idea of a "fortune at 60" in the form of a lump sum settlement, with the comment: "What a difference in the psychological aspect—the bright, colorful glamour of a fortune as compared to a somewhat drab and pale pension amounting to but one-third, or one-half, or at best, two-thirds of his working wage. To an employee under this plan 'Life begins at 60.'" It is encouraging to note that the authors of this book do not approve of this idea and emphasize that, if the purpose is old-age security, then "pension, annuity, or other income-certain provisions should be considered normal settlement arrangements, under the guidance of the trustees, and settlement by distribution in a single lump sum should be made only in exceptional cases."

A comparatively novel idea suggested by the Senate Committee and approved by the authors of the book is that a life insurance benefit should be included that would decrease in amount as the savings element to the credit of an individual increases. Only in recent years has this idea become prominent in group life insurance plans, and even yet group insurance coverage is usually smallest where its need is most urgent and largest where it is of least importance.

In case of dismissal or voluntary withdrawal from service it is recommended that the employee shall receive his own contributions with interest, plus from 40 to 60 per cent of the accumulation of the employer's contributions. This is encouragingly liberal as compared with provisions of many group annuity plans, although it is gratifying to note that the tendency is toward larger withdrawal benefits under these other plans. The authors' discussion carries distinctly the idea of forfeiture on withdrawal, for the purpose of reducing turnover. Perhaps a transition is taking place with respect to this incentive: there is some doubt of the value of an employee held to his task by a penalty and besides, if we are discussing a share in profits that have already

accumulated, we may be on more dangerous ground than if we are discussing a contractual relationship under which an employer contributes regularly, whether or not he has made a profit.

The Senate Committee suggests investment of employer contributions in obligations of the employer and the authors approve. Both would distinguish for investment purposes between employer and employee contributions, and the authors would invest differently before and after an employee retires. Without reference to legal restrictions the reviewer suggests that all investment of such funds should at all times be free from the risk of the employer's business. There is good logical ground for the point of view that investment should be at the discretion of the governing body of the trust and that if, in their discretion, obligations of the employer are attractive investments, these should be permitted on the same basis as the obligations of any other corporation. But the members of this board should be sympathetic with the management of the employing corporation and there is too much danger that partiality may be shown. Surely the trust will be under no great handicap if it must refrain from such investment, and the employer will lose nothing if trust obligations have a ready market. The absence of such a market should certainly be a danger signal to the trustee. Too often in such discussion it is assumed that the employer will always be strong financially but if our economic history teaches anything it is that this assumption is not justified.

Throughout this book runs the strain that corporations are being taxed too severely and that no stone should be left unturned to lower these taxes. The method is to center attention on the lowering of taxes for each particular corporation, and it is not clear whether the authors place their principal defense for profit-sharing schemes on their tax-lowering possibilities or on their intrinsic merits. Of course the officers of every corporation are interested in anything that will lower the corporation's taxes. But in advocating profit-sharing plans it would be short-sighted to neglect the prospect that any widespread lowering of taxes would in all probability result in revision of the basic scale of taxation so as to produce total revenue comparable to that formerly collected.

RAINARD B. ROBBINS.

Trends in Industrial Pensions, Murray W. Latimer and Karl Tufel. Industrial Relations Counselors, Inc., New York, 1940. Pp. x, 88.

A foreword by Bryce M. Stewart, Director of Research for Industrial Relations Counselors, points out that in 1933 this organization published a two-volume study entitled *Industrial Pension Systems in the United States and Canada* by Murray W. Latimer and that the present publication summarizes changes that have taken place in this field down to the close of 1938. A more extensive publication is contemplated in 1941 to give a summary of the provisions of the various plans as of the end of 1940. The text of the publication under review justifies the title. It consists of 13 short sections which, aside from an introduction and a summary, condense statements of findings under the headings:

Recent Developments Affecting Pension Plans
Spread of the Pension Movement
Private Pension Plans and the Federal Pension System
Eligibility for Participation in Pension Plans
Conditions for Retirement
Determining Pension Allowances
Vesting of Annuities
Growth in Number of Pensioners and Amount of Pension Payments
Extent of Funding
Changes in the Basis of Reinsurance
Effect of Certain Taxes on Pension Plans

The authors deliberately avoid discussion of the merits of the trends they note in the characteristics of pension plans, apparently reserving such evaluation for the more extensive publication contemplated next year. Statistical analyses of the pension plans studied are given in 26 tables that appear in an appendix. A careful reading of these tables will disclose many points of interest that could not be emphasized in the brief text. They reflect a very extensive study; to bring this up to the end of 1940 will be of distinct value.

RAINARD B. ROBBINS.

The Social Security Payroll Taxes. Ralph T. Compton. Commerce Clearing House, Inc., Chicago, 1940. Pp. xvii, 446.

Social Security Taxation and Records. Calvin E. Favinger and Daniel E. Wilcox. Prentice-Hall, Inc., New York, 1939. Pp. xxi, 649.

In the preface to *The Social Security Payroll Taxes* the author describes the work as "a guide to the rules by which the payroll taxes are administered and by which their cost to the taxpayer may be minimized" which is "offered primarily to three types of readers—the employer-taxpayer and his agents, the tax administrator and the university student." The author is Director of Research of the Associated Industries of Missouri and in that capacity one of his chief duties has been to assist employers toward an understanding of payroll tax requirements. The book comprises a discussion of the practical questions which confront payroll taxpayers.

In addition to the federal old-age and unemployment insurance acts, there are now unemployment compensation laws in 48 states, the District of Columbia, Alaska and Hawaii. Consequently any discussion to be of value to the employer must be much too detailed to be of interest to the general reader. The book is divided into 4 parts: Part I, *Scope and Background of the Social Security System;* Part II, *Payroll Tax Rates, Credits and Measure;* Part III, *The Tax Base—"Employment by Employers";* Part IV, *Minimizing Payroll Tax Costs: Unemployment Benefits and Employer Experience Rating.* The following chapter headings from Part III, *The Tax Base—"Employment by Employers"* will further indicate the nature of the detail contained in this book:

Chapter VI Coverage—"Employers" Subject to Tax
Chapter VII "Employments" Subject to Tax
Chapter VIII Employees and Independent Contractors
Chapter IX Who is the Employer of an Employed Person?
Chapter X Exempt Employments
Chapter XI Interstate Allocation of Taxable Wages

These 6 chapters by the way represent 161 pages. As a reference work for employers, particularly those employing a considerable number of persons, this book would appear very useful.

Social Security Taxation and Records, to quote from the preface, "has been designed primarily as a practical guide to employers

who are confronted and must contend with the problems arising as a result of social security legislation, to engineers who may be called upon to advise in the development of social security record-keeping systems, and to salesmen and representatives of office appliances so that, with a better understanding of the requirements of such records, they may be better equipped to recommend systems to prospects that will take care of their needs adequately." This book in part discusses the same questions as *The Social Security Payroll Taxes,* although in not nearly as much detail. About one-half the book, to quote from chapter headings, is devoted to a consideration of such questions as: *Records Required, Reports, Where Should the Records Be Kept, Sources of Information, Principles of Social Security Accounting Systems.* There are described more than 40 social security record-keeping systems ranging from simple systems suitable for very small establishments to those using bookkeeping machines, punched cards and tabulating equipment. The book contains many illustrations of office forms and tabulating cards used in various record-keeping systems.

HOWARD G. CRANE.

PUBLICATIONS RECEIVED

Accident and Health Insurance, Edwin J. Faulkner. McGraw-Hill, New York City, 1940.

Best's *Fire and Casualty Aggregates and Averages.* First Annual Edition, 1940. Alfred M. Best Co., Inc., New York City, 1940.

College Plans for Retirement Income, Rainard B. Robbins. Columbia University Press, New York City, 1940.

Digest of Workmen's Compensation Laws of the United States and Territories. 16th Edition. Association of Casualty and Surety Executives, New York City, 1939.

Food, Teeth and Larceny, Charles A. Levinson. Greenberg, New York City, 1940.

Liability for School Accidents, Harry N. Rosenfield. Harper & Bros., New York City, 1940.

Manufacturer and Insurance, Lawrence S. Myers. Revised Edition. National Underwriter Company, Cincinnati, 1940.

Modern Fire Underwriter, Charles F. Rupprecht. Spectator Company, Philadelphia, 1940.

Compensation of War Victims. Studies and Reports, Series E, No. 6. International Labour Office, Washington, D. C., 1940.

Motor Vehicle Inspection Manual. American Association of Motor Vehicle Administrators, Washington, D. C., and National Conservation Bureau, New York City, 1940.

Principles of Surety Underwriting, Luther E. Mackall. (Fifth Edition) The Spectator Company, Philadelphia, 1940.

Review of the following publication appears in the current numbers of the *Transactions* of the Actuarial Society of America and the *Review* of the American Institute of Actuaries:

Blood Pressure Study, 1939. Compiled and published by the Actuarial Society of America and the Association of Life Insurance Medical Directors, New York, 1940.

CURRENT NOTES

THOMAS O. CARLSON, CURRENT NOTES EDITOR

AUTOMOBILE

Rate Changes

The only rate changes for Automobile made effective in the last few months were in New York and Texas; in both states the average effect of the rate changes was a substantial reduction.

Policy Forms

A new automobile policy known as the schedule liability form was issued effective September 16, 1940. The new policy offers a means by which insurance may be afforded, at the option of the insured, for (1) automobiles owned by the insured, (2) automobiles hired by the insured and (3) automobiles not owned by the insured but which are used by others in connection with his business.

Before this policy was issued, in order to provide insurance for all three of these elements the basic policy had to be amended by the addition of endorsements.

BOILER AND MACHINERY

New Coverages

Seasonal plant ratings were introduced last June for Boiler and Machinery insurance. Under this form of rating plants operated on a seasonal basis are allowed a reduction in premium with no suspension of the insurance during the off-season period.

On July 15 there was introduced an optional form of coverage known as Group Coverage. This is a plan for insuring certain kinds of boiler or machinery objects by groups without listing or describing the individual objects in the policy. The premium for the group is fixed at the beginning of the policy period, no adjustment of premium being made for objects added to or subtracted from the group during the policy term.

Effective last December, coverage for malicious mischief, vandalism and sabotage was made available. This new coverage is effected by endorsement of the standard boiler and machinery policy.

BURGLARY

Bank Burglary & Robbery

Bank Robbery rates were reduced in thirty-six states effective September 2, 1940, the average reduction in the countrywide rate level being about 15%.

At the same time the underwriting rule governing terms of policies was amended to permit the writing of all bank burglary and robbery policies for a term of three years. Previously the writing of three-year policies had been restricted to certain territories and coverages.

GENERAL

Comprehensive Liability Policies

On January 20, 1941, policy forms and manual rules were made available for the writing of comprehensive liability insurance. Standard provisions were established for comprehensive automobile liability policies, for comprehensive general liability policies, and for combination comprehensive automobile and general liability policies.

The essential differences between these new comprehensive liability policies and the regular form policies written heretofore are first, that they insure against liability for all hazards not specifically excluded, second, that the insurance afforded applies, automatically and without notice to the company, to almost anything the insured may do during the policy term and, third, that they fill in such chinks or gaps as may be left open when specific hazards and operations are insured. The new policies are of the single insuring clause type whereas the standard forms of separate and schedule policies insure specifically described operations or hazards selected by the insured.

In the past, whenever automatic coverage has been given, it has generally been afforded on condition that notice be given to the company within a specified number of days. Under the new program, a complete survey of all existing and anticipated hazards will be made on each risk prior to issuance of a comprehensive policy which will insure against liability for all such hazards and in addition all other hazards which may develop

during the policy term and which are not specifically excluded. The initial premium for the policy is based on the hazards disclosed by the survey and adjustment is made by audit each year to determine the hazards which actually existed.

In order to obtain a comprehensive automobile policy an insured must be willing to insure his complete automobile liability for both bodily injuries and property damage for all owned automobiles, hired automobiles and employer's non-ownership. Garage operations are not as yet included under this program. In order to obtain a comprehensive general liability policy an insured must be willing to insure his liability for bodily injuries in connection with all hazards except product and contractual liability which are optional. All property damage liability is also optional. Workmen's compensation and employers' liability are excluded from this policy.

The advance premium for a comprehensive policy is obtained by applying the rules, classifications, rates and minimum premiums contained in the manuals to the insured's existing exposures in the regular manner. The resulting total premium is then increased by 1% which is the additional charge for the comprehensive feature of the insurance. At the end of the year an audit is made and the advance premium is adjusted in accordance with the insurance afforded during the year.

Tuition Refund Plan

A new form of indemnity for educational institutions which has been current in England is now being written in the United States by a few companies. The coverage as written by one company is termed the "Tuition Refund Plan" and indemnifies parents for tuition fees that would otherwise be forfeited should a student be incapacitated by illness, accident or quarantine, from continuing his or her course at school or college. In the event of the closing of an institution due to an epidemic, refund is provided for every school day lost, whereas in the case of illness of a pupil there is a deductible period of one week. The name of each student insured is listed on a master policy which is held by the school on behalf of the parents.

Glass

Rate Revision

A number of changes were made on September 2, 1940, in the rates and rules for the insurance of glass. The rates for commercial, public livery and private livery automobiles were reduced by about two-thirds. Other classification rate changes affected neon signs and refrigerator show cases, and store fronts. The territorial and zone differentials were changed in twenty-four rating territories but the net effect countrywide was negligible.

Miscellaneous Liability

Manual Changes

Continuing the program of separating its manual of liability insurance into separate manuals for each line, the National Bureau of Casualty and Surety Underwriters, on August 19, 1940, issued two new self-contained manuals, one for Product liability and one for Elevator liability. The rules and rates on these lines were formerly incorporated in the Manual of Liability Insurance along with Manufacturers' and Contractors', Teams, and Owners' or Contractors' Protective liability. The Owners', Landlords' and Tenants' line had been placed in a separate manual the previous year. With the issuance of the new manuals there was an extensive revision of rules and classifications. The classification wordings for the manufacturing classifications in the Product manual were revised so that the reference now is to the product manufactured rather than to the type of manufacturing.

Rate Changes

Effective August 19, 1940, the rates for Product bodily injury and property damage liability were revised countrywide. The effect of the revision on the bodily injury manual rate level countrywide was a reduction of 18%. For property damage the countrywide reduction was estimated to be about 35%. The standard minimum premiums were also reduced on both coverages.

Lower excess limits tables were made effective for both bodily injury and property damage. The reduced bodily injury tables made effective the previous year for Owners', Landlords' and Tenants' liability were made applicable to the Product line while a new reduced property damage excess limits table was introduced.

Effective on the same day as the Product liability rate revision the rates for Elevator liability and collision were revised throughout the country. The number of rating territories for bodily injury was increased from seven to twenty, the rates being increased in some territories and reduced in others. The effect of the rate revision on the countrywide bodily injury rate level was a slight reduction. Elevator property damage and collision rates, which are on a countrywide basis, were also reduced, the reductions amounting to approximately 20% for property damage and to more than 50% for collision.

The reduced bodily injury and property damage excess limits tables which had been introduced for Owners', Landlords' and Tenants' liability the previous year were made applicable to the elevator line.

Experience Rating Plan

The manual rule with regard to the policy period for Elevator and Owners', Landlords' and Tenants' bodily injury risks qualifying for experience rating was changed on August 1, 1940. Prior to that time, policies covering such risks in the states in which the experience plan was effective could not be written for a longer period than one year. Beginning on that date the new rule permits policies on experience-rated risks to be written for either one year or three years, the three-year policies to be subject to the usual discounts applicable to non-experience-rated risks as well as to experience modifications.

SURETY

Graded Commissions

On October 22, 1940, a scale of graded commissions payable on bonds covering aircraft, shipbuilding and supply and advance payment bonds in connection therewith was made effective. The maximum commission payable ranges from 30% on the first $25,000 of premium to 5% on that portion of the premium over $100,000. The graded schedule contemplates, on the part of the companies, a reduction of the premium charge made to the obligee to reflect the savings in commission. The rule was adopted in

answer to the national emergency and is subject to review in eighteen months.

Forgery Manual Changes

A new forgery section of the surety manual was issued last December. Included in the new pages was the authorization of a rider eliminating reinstatement premium charges. The additional charge for the attachment of such a rider to the policy was set at 3% of the current annual premium, with a minimum of $15. Other changes contained in the new pages included new rules for blanket coverage on branches under the depositors forgery bond and rate reductions for larger amounts of insurance under both the securities blanket bonds.

Workmen's Compensation

Legislation

On December 5, 1940, a workmen's compensation law became effective in the State of Arkansas, having been approved at the polls on November 5. This leaves Mississippi as the only state in which workmen's compensation legislation is not effective. Rates were promulgated for Arkansas by the National Council, based on the rates for Louisiana with proper adjustments for differences in benefit levels and other provisions affecting rates.

Legislation enacted during 1940 increased compensation costs by the following estimated percentages.

State	Estimated Increase
Alabama	1.4%
Kentucky	2.9%
New York	0.8%

The change in Alabama also extends the act to include employers having eight or more instead of sixteen or more employees, bringing an estimated 2,700 additional concerns under the law.

Rate Revisions

The downward trend in rate levels continued during 1940, all rate level changes made during the year being downward except for New Jersey, where a 2.4% increase was made effective.

Multi-Split Experience Rating Plan

The Multi-Split Experience Rating Plan developed by the National Council on Compensation Insurance, which was mentioned in Current Notes, Volume XXVI, having been approved by over two-thirds of the jurisdictions to which it had been tentatively submitted, is being filed by the Council with the various state authorities concurrently with the filing of the general rate revisions. The plan is to be known as "Experience Rating Plan—1940." A complete explanation of it is given by Mr. J. J. Smick in Volume XXVI, Part I, of the *Proceedings*.

By January 1, 1941, the plan was already in effect in Massachusetts, Michigan, Minnesota, Missouri, Utah and Wisconsin and effective dates later in the year had been set for several other states.

Retrospective Rating Plan

The Texas Board of Insurance Commissioners on August 10, 1940, promulgated revised basic premium ratios applicable to risks rated under the Texas Retrospective Rating Plan. The new rating values reflect the graduation of provisions for certain company expense by size of risk.

Personal Notes

Eckford C. DeKay is President of DeKay & Company.

C. H. Franklin has retired and is now residing in Seattle, Washington.

Harry V. Williams is connected with the Rating and Research Department of the Hartford Accident and Indemnity Co.

LEGAL NOTES

BY
SAUL B. ACKERMAN
(OF THE NEW YORK BAR)

ACCIDENT—MEANS

[Provident Life & Accident Ins. Co. *vs.* Wallace, 137 S. W. (2d) 889.]

The plaintiff purchased an accident policy covering "bodily injury which is effected solely through external, violent and accidental means * * *."

The plaintiff testified that he stopped his automobile at the curb and went into a store to make a purchase, when he returned and attempted to start his car it started momentarily and stopped and he again stepped on the starter without results and repeated this motion a time or two. He then got out of his car and started to push it in order to start the motor in this manner. After he got the car started he got back into the car and his side began to hurt.

He went to his doctor and learned that he sustained a hernia. This consultation was had seven days after the injury, and an operation was performed which disabled him for the period on which suit was based.

The plaintiff sued to recover two months benefit due to a hernia injury while attempting to push the car. What was the company's liability?

The court held that the plaintiff intended to push the car in order to start it, and to do so the car must be in gear requiring force to turn over the engine. He was conscious of the strain he was voluntarily exerting and necessarily anticipated the strain, but, of course, he did not expect a hernia to result from the strain. The only unforeseen and unexpected thing that happened was the rupture, which naturally resulted from the excessive strain voluntarily exerted.

Upon this state of facts, the court held that the injury which was effected was not caused solely through external, violent, and

accidental means. Therefore, the policy did not cover the injury and the plaintiff was not entitled to a recovery.

The general rule is that an injury is not produced by accidental means, within the meaning of the policy, where the injury is the natural result of an act or acts in which the insured intentionally engages. A person may do certain acts the result of which produces unforeseen consequences resulting in what is termed an accident; yet it does not come within the terms of this contract. The policy does not insure against an injury that may be caused by a voluntary, natural, ordinary movement executed exactly as was intended.

Automobile—Public Carrier

[Commercial Standard Ins. Co. *vs.* Foster, 31 F. Supp. 873.]

The defendant, a truckman, obtained an automobile liability policy written in accordance with the requirements of the Kansas statute. The statute provided that no license shall be issued to any carrier until such applicant shall have filed a liability insurance policy in a sum deemed adequate, "which liability insurance shall bind the obligors thereunder to pay compensation for injuries to persons and loss of or damage to property resulting from the negligent operation of such carrier."

In accordance with this requirement the defendant obtained an automobile insurance policy and the contract of insurance read: "Commercial Standard Insurance Company * * * does hereby insure the assured * * * against direct loss or expense resulting from claims upon assured for damages directly resulting from or caused by reason of the ownership or maintenance of the vehicles described * * * and directly resulting from the use thereof for the operations described—(transportation of merchandise, and for no other use or operation),—in direct connection with the assured's occupation (trucking, livestock and farm prod.) to an amount not exceeding the limit stated, etc."

The policy was made subject to the further condition that it did not cover loss arising from any use of the vehicle for any operation other than specified,—"transportation of merchandise. Principally over the route authorized by the Kansas Corporation Commission. * * * "

One Sunday evening, the defendant, accompanied by his family, sister, and mother-in-law, drove a truck, described in the policy, some five or six blocks from his home to that of his mother-in-law, the purpose being to return his mother-in-law to her home. No merchandise was being transported and none had been transported that day. The truck at times previously had been used by the defendant for the transportation of livestock and other merchandise. While the truck was parked in front of the home of the defendant's mother-in-law, the driver of a Ford automobile, drove into the rear end of the truck, the collision resulting in injuries and one death.

The company denied liability since the accident occurred while the vehicle was not used in the course of the assured's business as a contract carrier. In accordance with the statute a policy must be obtained covering injuries to persons or property "resulting from negligent operation of such a carrier." Was the insurance company responsible for the accident?

The court held that when the truckman took the members of his family into the truck and drove some few blocks to the home of his mother-in-law and parked the truck in front of her home, he was not engaged in an operation as a carrier, and there was no coverage.

It may be that it was not consistent with good public policy to require that a truck used in the transportation of merchandise be covered by insurance while engaged in such transportation, and, at the same time, leave the owner of the vehicle free to operate the vehicle for pleasure or personal convenience without insurance coverage. But, whether the Legislature was wise or unwise in prescribing the kind of policy which it did prescribe was of no concern to the court.

By the addition of a word or two to the statute it could have been worded to require that vehicles operated by a licensed carrier have insurance coverage irrespective of the nature of the operation. But that was not done, and the court was not warranted in reading into the statute that which was not there.

The defendant truckman relied in his argument upon the third paragraph of an endorsement of the Kansas Corporation Commission, which was attached to the policy. The provision read: "Nothing contained in the policy or any endorsement thereon, nor

the violation of any of the provisions thereof by the assured, shall relieve the company from liability thereunder." This portion of an endorsement attached to the policy was required by the rules of the Kansas Corporation Commission. The provisions and limitations of the policy and the Commission's power to adopt rules flow from the same statutory authority and the endorsement was in a sense subsidiary to the insurance contract. The endorsement, under the circumstances, should not be given effect that would operate to change the terms of the contract prescribed by the statute and written into the policy.

Bankers' Blanket Bond—Discovery Period

[Bank of Kaukauna *vs.* Maryland Casualty Co., 291 N. W. 319.]

The insured had a "Bankers' Blanket Bond" which was issued on April 1, 1931. The Bond was renewed annually until it was cancelled by the insured as of April 1, 1937. The loss which was caused by embezzlement by the bank's cashier was not discovered by the bank until April 21, 1938. On that day the bank notified the insurance company of its discovery of the loss and until that day there was no notice or intimation of any wrongdoing by the cashier. The policy provided that the insurance company should be liable for losses caused by employees prior to cancellation or should have terminated and should be discovered before the expiration of one year from such termination, and in case of all other losses, before the expiration of one year from the date of such cancellation. In addition the bond provided that notice should be given within ten days after discovery of any loss.

The bank contended that before the expiration of one year from its cancellation of the bond defalcations by its assistant cashier were discovered and an audit was made by which the amount of its loss by his defalcations was determined, and notice as to that loss was given to defendant prior to April 1, 1938; that in making that audit it was also discovered that the cashier and assistant cashier had conspired together to defraud the plaintiff by each embezzling money, etc., of the plaintiff for his own use, and to conceal the knowledge of each other's embezzlement from the plaintiff's officers and stockholders and the public. The bank

claimed that its discovery within the one year period of the assistant cashier's defalcations and of the conspiracy between him and the cashier constituted such a discovery that the loss sustained by reason of the cashier's defalcations was likewise to be deemed to have been discovered within that one year period; and that therefore the latter loss was within the coverage of the bond.

The bank did not contend that the assistant cashier or the cashier was the instigator of defalcation or wrongdoing by the other or in any way actively participated in bringing it about, or that the loss caused by either's defalcations was in any way attributable to the other, or that either received or was benefited by the fruits of the other's defalcations. On the other hand, it appeared that the loss due to the assistant cashier's defalcations was separate and distinct from the loss by reason of the cashier's defalcations, and that the latter loss was not part of the loss due to the defalcations by the assistant cashier which were discovered within the one year period. What were the rights of the bank?

The court held that under the circumstances the mere facts that each employee was aware of the other's defalcation and that they conspired to conceal their knowledge thereof, and that the discovery within the one year period of the existence of the conspiracy ultimately led to the discovery, after the expiration of that year, that is on April 21, 1938, of the loss caused by the cashier's defalcations, did not constitute the loss by reason of his defalcations any part of the loss caused by the assistant cashier. Consequently the discovery within the one year period of the loss caused by the assistant cashier was not likewise such a discovery within that period of the loss caused by the cashier as was necessary in order to constitute the latter loss within the bond coverage. The provision limiting the coverage to such losses as should be discovered before the expiration of one year from the date of the cancellation of the bond was absolute and unconditional. Only such loss as was in fact discovered within this period was in the coverage and unless it was so discovered there could be no recovery therefor under the bond.

Moreover, even if plaintiff's discovery of the assistant cashier's defalcations and of the conspiracy between him and the cashier

before the expiration of the one year period on April 1, 1938, could have been deemed to constitute also the discovery within that period of the loss caused by the cashier, plaintiff would still not be entitled to recover because of the failure to give notice to defendant of the cashier's defalcation within ten days after such discovery thereof.

COMPENSATION—LOCATION

[Sponheimer *vs.* Kelly et al., 18 N. Y. S. (2d) 266.]

An employer was the owner of premises at Nos. 214 and 222 East 41st Street, New York City. He also owned a private residence at 55 East 193rd Street, a farm at Norwalk, Connecticut, and a property on 37th Street, New York City. He leased the properties on East 41st and 37th Streets and occupied the residence and farm. Claimant was employed by him as a janitor for the leased properties and to do whatever was necessary about the premises. On April 29, 1938, the employer directed the claimant to go to his residence on East 193rd Street to assist in taking in some coal. He was there directed by the employer to cut a limb from a tree in front of the premises and while so engaged fell from a stepladder and was injured.

The employer had purchased a workmen's compensation policy and the declarations of the policy gave the location of all the buildings or other workplaces of the employer as "218 East 41st Street, New York, N. Y.," the classification of operations as "Building (N. O. C.)—operation by owner or lessee—including care, custody and maintenance of premises, the operation of elevators or heating, lighting or power apparatus," and also contained this statement: "Item 5. This Employer is conducting no other business operations at this or any other location not herein disclosed—except as herein stated: Other locations, above operations only covered hereunder." The policy included a provision to the effect that the carrier agreed to indemnify the employer "against loss by reason of the liability imposed upon him by law for damages on account of such injuries to such of said employees as are legally employed wherever such injuries may be sustained within the territorial limits of the United States of America or the Dominion of Canada." At the time of the issuance of the policy

the carrier wrote the employer as follows: "Replying to your inquiry as to the scope of territorial coverage on the above captioned policy, we would direct your attention to paragraph 1, Division B of this policy which states that coverage applies any where within the territorial limits of the United States of America or the Dominion of Canada."

The insurance company claimed there was no coverage for the accident at the residence on East 193rd Street. What were the rights of the injured employee?

The court was of the opinion that the language used in item 5 of the declarations was ambiguous and should be construed most favorably to the assured. The operations specified in the policy were covered at other locations as well as 214 East 41st Street, and the work which the claimant was engaged in at the time of the accident and the location at which the accident took place came within the coverage under the policy.

Fidelity—Limitation of Liability

[Bradley *vs.* Fidelity Casualty Co. of New York, 14 A. (2d) 894.]

The defendant issued a Fidelity Bond in which the insurance company agreed to indemnify the plaintiff employer against the loss of any money * * * through the * * * dishonesty of any Employee named in the schedule forming part of the bond * * * while such Employee held any position at any place in the service of the Employer while the bond was in force.

The agreement was subject to the following conditions: "

* * * * * * * *

3. The liability of the Surety on account of any one Employee shall not exceed the amount set opposite the said Employee's name in the said schedule. * * *

* * * * * * * *

10. If this bond is issued as a continuation of a bond previously issued by the Company to the Employer, the Company shall be liable under this bond for any loss discovered after the termination of such former bond which may have occurred at a date at which the Employer may have been covered in respect of such

loss by the former bond; but the Company's liability (1) for any loss occurring within the term of the old bond shall be subject to the limit and conditions of the Company's liability specified under the said old bond; (2) for any loss occurring within the term of this bond shall not exceed the limit of the Company's liability specified in this bond. Subject to the foregoing limits as respects each bond, the Company's aggregate liability under both bonds for all loss or losses shall in no event exceed the greatest amount for which the Company could be liable for such loss or losses under one of the said bonds."

On February 23, 1935, after two renewals and while the bond was in effect, it was discovered that an employee named for $1,000 in the schedules each year was a defaulter. Subsequent investigation revealed that during the first year the bond was in force the losses attributable to him totaled $906.95; during the second year they exceeded $1,000; and during the third year amounted to $764.09, or a total of $2,671.04.

Plaintiff claimed the full amount upon the theory that the yearly premiums paid for a protection of $1,000 per year, i.e. that defendant's liability on the bond was cumulative. What were the rights of the plaintiff?

The court held that the bond did not automatically expire, and could be cancelled only by written notice. Such being the case, the insurer's liability was non-cumulative. Even if it was assumed that the technical effect of the schedules was to create successive bonds, in view of the express provisions of paragraph 10, the defendant's liability could not be cumulative.

The language of the bond indicated that the issuing of each subsequent schedule "as a continuation of a bond previously issued," and that paragraph contemplated a possible liability to the insured, within the specific limitations, for defalcations by any employee named in the applicable schedule occurring in any one, or two, or all three, of the years involved.

The paragraph expressly provided: "Subject to the foregoing limits as respects each bond, the Company's aggregate liability under both bonds for all loss or losses shall in no event exceed the greatest amount for which the Company could be liable for such loss or losses under one of the said bonds." In this case that "greatest amount" was $1,000. The plain meaning of the

words must control, and the fact that the defendant was a paid surety could not warrant a construction which would disregard the clearly expressed intention of the parties.

Garage Liability—Omnibus Coverage

[Newton *vs.* Employers Liability Assur. Corporation, 107 F. (2d) 164.]

Appellant was injured in Norfolk, Va., by an automobile driven by one Green, a salesman employed by Hudgins-Luring, Incorporated, the owner of the automobile. Green was driving the automobile with the permission of his employer but was not at the time engaged in the employer's business. A suit by appellant against Green and the employer resulted in a judgment for $5,000 against Green but absolving the employer from liability. Green was insolvent and execution against him was returned unsatisfied. The injured thereupon instituted suit to recover under the policy issued to the employer, on the theory that Green's liability was covered thereunder.

The policy was an automobile garage public liability policy. Hudgins-Luring, Incorporated, of Norfolk, Va., was named as assured and the operations of that company were described as "automobile dealer or repair shop."

Under the terms of the policy the term "Assured" was defined as follows in accordance with the approval of the State Bureau of Insurance: The unqualified word "Assured" includes not only the named Assured but also any partner thereof if the named Assured is a partnership, and the president, vice-president, secretary and treasurer of the corporation with respect to the operation, for business or pleasure, of any automobile owned by or in charge of the named Assured, except an automobile owned by such partner or officer or by a member of his family.

The policy was subject to the provisions of the Financial Responsibility Law. In accordance with the Law of the State it was required that: "No such policy shall be issued or delivered in this State, to the owner of a motor vehicle, by any corporation or other insurer authorized to do business in this State, unless there shall be contained within such policy a provision insuring such owner against liability for damages for death or injuries to

person or property resulting from negligence in the operation of such motor vehicle, in the business of such owner or otherwise, by any person legally using or operating the same with the permission, express or implied, of such owner." What was the liability of the insurance company?

The court held that there can be no question but that the provisions of the statute above quoted are made a part of the policy. This is expressly provided by paragraph four of the policy to the effect that the insurance provided by the policy "shall conform to the provisions of the motor vehicle financial responsibility law of any state or province which shall be applicable with respect to any such liability arising from the use of such liability during the policy period, to the extent of the coverage and limits of liability required by such law."

It was claimed that, since the statute required that the policy should contain a provision insuring the "owner against liability," its language had no application to cases such as this where there was no liability on the part of the owner. Such an interpretation would ignore the language which defines the liability as that "for damages for death or injuries to person or property, resulting from negligence in the operation of such motor vehicle, in the business of such owner or otherwise, by any person legally using or operating the same with the permission, express or implied of such owner." If the coverage should be limited to liability of the owner, one of the principal purposes of the statute would be defeated, i.e. to eliminate contests over coverage in actions under such policies. In fact, if the act was limited in interpretation to the liability of the owner, there would have been no point in its enactment, since under existing law there was no trouble as to the coverage of policies protecting the liability of the owner.

There was no reason to make any distinction between a garage liability policy and any other policy insuring against liability for damages resulting from negligence in the operation of a motor vehicle. The statute made no such distinction, saying in the broadest possible language "no such policy shall be issued," etc. The policy in question undoubtedly insured against liability for damages resulting from negligence in the operation of a motor vehicle; and it was perfectly clear that the mandate of the statute could not be avoided and the statutory coverage of the policy

narrowed by the method followed by the State Bureau of Insurance which may have followed a practice not in conformity with the requirements of the statute.

Hospital—Effective Date

[Stripp *vs.* United Casualty Co., 12 A. (2d) 167.]

On September 13, 1938, the plaintiff signed an application for a policy and as a result there was issued to her by defendant a policy dated September 17, 1938. Plaintiff also requested the issuance of a surgical rider, but because the agent did not then know whether such a rider was available, the rider was not issued until October 13, 1938. On the evening of November 23, 1938, plaintiff complained of pains in the lower right side of her abdomen and she visited a doctor, who diagnosed it as acute appendicitis. She went to the hospital the next day and was operated upon the following day and her appendix removed.

The policy insured "against loss due to expense of Hospital residence * * * necessitated by sickness which is contracted and begins while this policy is in force and after it has been maintained in continuous force for not less than thirty consecutive days from its date."

The insurance company argued that the policy, dated September 17, 1938, did not cover illness unless contracted after the policy has been in force for thirty days from its date, and as the surgical rider, dated October 13, 1938, was "subject to all the terms, conditions and provisions of said policy, "therefore the rider did not take effect until thirty days later. What was the company's liability?

The court held that the contention that the policy did not go into effect until October 13, 1938, would be a forced and unwarranted construction. The true meaning of the rider as stated therein was that the rider applied where the sickness was "covered by said policy," and therefore the effective date was September 17, 1938.

Liability—Alteration and Repairs

[Maryland Casualty Co. *vs.* Scharlack, 31 F. Supp. 931.]

The plaintiff insurance company issued an Owners', Landlords' and Tenants' Public Liability Policy to the defendant. An exclusion in the policy under "General Insuring Agreements" read as follows: "Subdivision VII. This policy does not cover: * * * ; nor any accident caused directly or indirectly by (2) any person employed by the Assured contrary to law as to age of employment, or under the age of sixteen (16) years where there is no such age restriction; (3) or resulting from additions to structural alterations in, or extraordinary repairs of the premises or any part thereof, unless a written permit, specifically describing such work, shall have first been granted by the Company, and attached to, identified with, and made a part of this policy, except that ordinary repairs may be made without such permit.

In the fall of 1937, while the policy was in force, the defendant, L. J. Scharlack, entered into a contract for substantial repairs and alterations on the first floor of the building, which were structural alterations or extraordinary repairs within the meaning of the above clause of the policy.

The entire building was heated by steam pipe fittings, and in connection with the alterations and extraordinary repairs, it became necessary to disconnect and take out the steam return lines in order to lower the floor of the building since the pipes were fastened to the bottom of the old wood floor. When the old floor was taken out, the pipes had to come with it.

While the structural alterations and extraordinary repairs were under way, the building was without heat. On November 19th some of the tenants on the upper floors (where no work was being done) complained that they were entirely without heat and notified Scharlack that they would refuse to pay rent and would hold him liable if they, or any of their employees were made ill by lack of heat. On November 21, 1937, while the repairs were still being carried on, a severe cold spell occurred. The building manager placed electric heaters in the offices but they burned out the fuses. He then bought approximately eighteen charcoal burners which were used for some three or four days. Kerosene oil was poured on the charcoal and lighted with matches.

The burners would not have been used to heat the upper floors of the building had it not been for the fact that there was no heat in the building at that time.

The charcoal burners gave off injurious fumes in the offices on the second and third floors. Five of the original defendants in this case brought suits for damages against Scharlack in the state court. Plaintiff was duly called upon by Scharlack to defend these suits but the company disclaimed liability in writing stating that the claims were based on conditions that were a direct result of extraordinary repairs or structural alterations of the premises insured. Suits by other tenants were filed against Scharlack, and plaintiff again denied liability on the same grounds.

The state court suits resulted in judgments against defendant Scharlack totaling $6,500. The defendant, L. J. Scharlack, paid $1,025 in attorney's fees in defending the actions in the state court.

As originally brought, plaintiff asked for an injunction restraining the further prosecution of the suits in the state court, which application was refused by the court.

The plaintiff contended that as applied to the facts in this case the exclusion provisions of Subdivision VII should read: "This policy does not cover: * * * any accident * * * directly or indirectly * * * resulting from additions to, structural alterations in or extraordinary repairs."

In other words, the plaintiff contended that the words "directly or indirectly" appearing in sub-paragraph (1) of the exclusion clause should be read into sub-paragraph (3) as well as sub-paragraph (2), which immediately follows the words "directly or indirectly." The plaintiff claimed that the accidents, which resulted in judgments against Scharlack in the state courts, "indirectly" if not "directly," resulted from the structural alterations and extraordinary repairs. What were the rights of the insurance company?

The court held that even a casual reading of the exclusion paragraph in the policy demonstrated that it was "of uncertain import and reasonably susceptible to a double construction." The most that could be said of it, favorable to the insurer, was that it was not clear whether the words "directly or indirectly" limiting the words "caused by" likewise limit the subsequent words "resulting

from," appearing in a separate numbered sub-section of the exclusion clause and separated from the preceding sentence by a semicolon.

In other words, if the words "directly or indirectly" had been placed in front of the words "caused by," and words "or resulting from" had immediately followed, there would have been no doubt that it would have applied to each of the succeeding numbered sub-sections.

Applying the rule which requires a construction favorable to the insured in cases of "uncertain import," the court held that the words "directly or indirectly" apply to and limit only the phrase, "any accident caused directly or indirectly by (2) any person employed by the Assured contrary to law as to age of employment, or under the age of sixteen (16) years where there is no such age restriction"; and did not apply to, limit or restrict the succeeding numbered sub-section (3), "or resulting from additions to, structural alterations in or extraordinary repairs of the premises, or any part thereof * * * ."

The purpose of the exclusion clause as to "structural alterations" or "extraordinary repairs" of the premises was, of course, that the insurer should not be subjected to the unusual hazards of such an undertaking without compensation therefore. Certainly since Scharlack did not secure a written permit for the repairs from plaintiff, a person injured by falling timber or by stumbling over debris, etc., could not recover on the policy. It was equally clear that, under ordinary circumstances, if the steam heating apparatus had suddenly become unworkable from other causes, thus making it necessary for Scharlack to furnish heat by means of charcoal burners, the insurance company would have been liable for Scharlack's negligence in respect to the burners.

The causes of action against Scharlack asserted in the state courts were based not upon any negligence, direct or indirect, in making the alterations but upon Scharlack's negligence in the matter of furnishing charcoal heaters which threw off carbon monoxide fumes. It was questionable whether these causes of action resulted even indirectly from the alterations; they may have; but, in the opinion of the court it was too far fetched to discharge the insurer where the exclusion provisions were susceptible of two interpretations, equally fair, one of which allowed,

and the other defeated, recovery. Therefore, the company was liable.

Liability—Notice of Claim

[Brookville Electric Co. *vs.* Utilities Ins. Co., 142 S. W. (2d) 803.]

Plaintiff, Brookville Electric Company, an Indiana corporation, the insured under a reciprocal policy of public liability insurance issued by the Subscribers at Utilities Indemnity Exchange in St. Louis, Missouri, instituted this action against defendant, Utilities Insurance Company, the reinsurer of the contract, to recover the amounts which plaintiff was compelled to pay out in the defense of, and in satisfaction of a judgment rendered in an action brought against plaintiff in the state of Indiana in 1931 by Urban J. Schuck to recover damages for personal injuries sustained by Schuck in 1919 in a manner falling within the coverage of the policy.

The policy provided that upon the occurrence of an accident, the insured should give immediate written notice thereof, with the fullest information obtainable at the time, to the head office of the Exchange; that the insured should give like notice of claims for damages on account thereof.

The defendant denied liability to the plaintiff upon the ground that the plaintiff, in violation of the provisions of the policy, had failed to give it immediate written notice of the institution of Schuck's action.

Schuck was only ten years of age at the time he was injured in 1919 by coming in contact with a live wire maintained by the plaintiff in connection with the operation of its electric power plant in Brookville, Indiana.

On April 19, 1919, the very next day after the accident, plaintiff's then attorney, Milford P. Hubbard of Brookville, gave written notice of the accident to the St. Louis office of the Exchange, which thereupon proceeded to have an investigation made by a firm of lawyers in Indianapolis, Indiana, who at that time were representing the Exchange in that state. The fact of the making of such investigation was subsequently ascertained in 1934 by the discovery in defendant's files of a cancelled check for $61.50, bearing date of March 17, 1920, and made payable

to their attorneys for legal services in connection with the Schuck accident.

Following the accident, no claim was made that Schuck, who was then a minor child, had been seriously injured, so that although the plaintiff, through the efforts of its attorney, Hubbard, paid the doctor's bill and took a release of some sort from the father, there was no legal settlement made of the minor's own cause of action. On May 29, 1931, after Schuck had meanwhile attained his majority, he instituted an action in Indiana against the plaintiff and one Brockman, the former president and chief owner of plaintiff company.

On the same day a summons was issued by the sheriff, commanding him to summon Brockman and the then local manager of the Brookville Electric Company, to appear in court on July 20, 1931, to answer to Schuck's complaint.

The record shows that Brookville Electric Company had originally been operated as a small family corporation owned entirely by Brockman and his three sons, but that in 1926 the interest of the Brockmans was sold to certain parties, who in turn transferred that interest to the Cleveland Southwestern Railway Company, a member of a chain of utility companies with holdings throughout that territory. A year or so later some one of the new owners came to Brookville and removed the company's papers and records. In the course of time, the insurance policy was either lost or misplaced and was never found. When Schuck's action was instituted in 1931, the persons then in control of the affairs of plaintiff company knew nothing of the existence of an insurance policy in 1919 when Schuck was injured, and for that reason failed to give immediate notice to the defendant of the claim for damages that had been made.

Judgment was in favor of Schuck, and against Brookville Electric Company, for the sum of $3,000 and costs, which judgment Brookville Electric Company paid on August 19, 1935.

Although Schuck's action was instituted on May 29, 1931, it was not until fifteen months later, on August 30, 1932, that defendant was notified by the utilities company attorney Hubbard of the pendency of the suit.

Upon receipt of this letter, defendant advised Hubbard, under date of September 1, 1932, that it had been unable to find evi-

dence in its records either of any policy coverage on Brockman or Brookville Electric Company during 1919, or of any claim made against such parties in that year; and further advised that its "records for the period as far back as 1919 may have been destroyed."

On May 9, 1933, when Hubbard again wrote the defendant, advising that he had resurrected from his files a copy of his letter of April 19, 1919, in which he had notified the Exchange of the happening of the accident on the day before, and in which the number of the policy then outstanding had appeared. Such copy was enclosed by Hubbard for defendant's information; and his letter concluded with the advice that Schuck's case was still pending undetermined in the court.

On May 22, 1933, defendant wrote Hubbard, noting that the case would be set down for trial at the September term, and that the interest of the insured was being meanwhile protected; and suggesting that in the immediate future one of its representatives would call upon Hubbard in regard to the matter. On September 8, 1933, it again wrote Hubbard, inquiring if the issues had been definitely made up and the case actually set for trial.

The whole of the correspondence between Hubbard and defendant from August 30, 1932, until September 8, 1933, showed no positive and unqualified disclaimer of liability but on the contrary the defendant was continually seeking information relative to the facts of the claim and the status of the suit then pending as though it had an interest of some sort in the outcome of the case.

On December 1, 1933, there was a definite and final disclaimer of liability, which was contained in a letter to Hubbard from the company's attorney. In that letter, it was claimed that Hubbard had never furnished defendant with a copy of the policy, the number thereof, or any other record of the same; alleged that the delay in notifying defendant of the happening of the accident and the institution of Schuck's action had greatly prejudiced defendant.

Subsequently, a representative of the utility company came to St. Louis to consult the manager of defendant's claim department, who finally acknowledged, from the facts and circumstances brought to his attention, that the Exchange had probably issued

a policy covering Brookville Electric Company, but nevertheless stood upon defendant's previous denial of any liability thereunder. The chief significance of this conference is that it was then that the defendant for the first time definitely disclosed the fact that its files had been destroyed in October, 1931, ten months prior to the time of the giving of notice of the pendency of Schuck's action, which circumstance forms the basis of its claim of prejudice on account of the delay in giving notice. Defendant's manager admitted that in destroying Schuck's file, which had to do with a claim upon which a suit could yet be filed, he was taking a chance, but he asserted that he had regarded the hazard as "nil," inasmuch as the company had "never had kickbacks" over such a matter before. What were the rights of the insurance company?

The court held although notice was not given of the pendency of Schuck's action until fifteen months after its institution, such delay was not unreasonable as a matter of law.

Twelve years had passed since the happening of the accident, during the course of which the ownership of the plaintiff company had been transferred from local hands in Brookville to a chain of utilities owned by a New York holding company. So far as the evidence went, the delay in notifying defendant of the institution of the action was in nowise attributable to negligence on the part of any one then connected with the management of plaintiff company; and where such officers did not sooner know of the existence of the policy, a delay of even fifteen months was not, as a matter of law, to be considered an unreasonably long time to have postponed the giving of notice.

The defendant was not prejudicially affected by such delay. To be sure, it had destroyed its Brookville Electric Company file five months after suit was brought and ten months before it was notified of the pendency of the action. Defendant itself had thought so little of the worth of its file as to destroy it although it knew that Schuck's own personal cause of action had never been effectively disposed of, and under such circumstances the court could not presume, in the absence of evidence of the contents of the file, that it contained information which would have altered the result in Schuck's case in a manner favorable to defendant.

Moreover, while it was true that defendant was not given notice of the pendency of Schuck's action until fifteen months after its institution, the fact remained that it received notice long prior to the time the case was put at issue, and two years and ten months before the case was tried. It was two years before the trial that defendant was advised of the number of the policy, and one year before the trial that it came upon the cancelled check to its attorneys, which had been issued in payment of their services and expenses in connection with their investigation of the accident.

Robbery—Guard

[A. J. Bayless Markets *vs.* Ohio Casualty Ins. Co., 104 P. (2d) 145.]

The action was brought against the defendant to recover loss by robbery within the insured's place of business, a retail food market.

About 9:30 P. M., Sunday, November 27, 1938, the general manager of the store was telephoned at his home that a front window in the store was broken. The caller identified himself as the patrolman on the beat and stated he would wait at the store if the general manager would come immediately. While the latter was preparing to answer the call and just as he was approaching his automobile, parked at the side of his home, a man pressed against his back an object, which the general manager believed to be a gun, and ordered him into the automobile under a threat of being "blasted." At the same time another man took the wheel of the general manager's automobile. They drove around town for a while and in the meantime tied the general manager's hands together, blindfolded him and placed him between the front and back seats. They forced him to divulge the combination of the store safe. When they arrived at the store one of them stood on the outside and the other entered with the general manager and compelled him to unlock the store safe, from which the robber took $1,044.15 in money. The robbers then drove away leaving the general manager in the store.

The policy provided insurance against robbery on the inside of insured's premises, when the property taken was of the kind usual to the insured's business, and "while at least one custodian

is on duty therein," which was contained in the declarations on the back of the policy. What were the rights of the insured?

The court held that the plain meaning and evident purpose of the words "on duty" was that at the time of the robbery there should be someone on duty, who might be able to offer resistance or give an alarm, thus minimizing the risk of loss.

The plaintiff contended that since the main body of the policy contained no limitation of liability for loss of property "while at least one custodian is on duty," the insertion of such a clause in the "Declarations" on the back of the policy should be treated as mere inducement to the insurer to issue the policy and not a part of the policy. The court stated that this view was hardly tenable. The policy began with these significant words: " * * * Company does hereby agree with the assured named in Item 1 of the Declarations forming a part hereof, as respects Money or Securities, or both, and such Merchandise as is described in the Declarations and stated therein to be insured hereunder: * * * " and ended as follows: "XIV. The statements in Items numbered 1 to 17 inclusive in the Declarations hereinafter contained are declared by the Assured to be true. This Policy is issued in consideration of such statements and the payment of the total premium in the Declarations expressed." Without the declarations there would be no way of identifying the insured or his property or provisions agreed upon and inserted in the contract at the time of its making and not contained in the main body thereof.

A careful examination of the contract indicated that there was no ambiguity in the language employed and, therefore, the company was not liable.

OBITUARY

JAMES D. CRAIG

1878 - 1940

James Douglas Craig, former President of the Society, died at his home in Ridgewood, New Jersey, on May 27, 1940, only a few months after he had retired on account of ill health as Vice-President of the Metropolitan Life Insurance Company.

Mr. Craig was born on April 13, 1878, in Brooklyn, New York, the son of James McIntosh Craig, then Actuary of the Metropolitan Life Insurance Company. Following his graduation from high school, he entered the service of the Metropolitan in 1896 as a clerk in the Actuarial Division. He was appointed as Assistant Actuary thirteen years later. In 1922 he became an Actuary of the Company and in 1936 Vice-President in charge of Home Office operations.

Mr. Craig was an outstanding executive. He encouraged independent thinking and many of the young men trained under his supervision have advanced to important positions in actuarial and other fields with his own and in other companies. He was always very progressive and assumed a leading part in new lines of business such as Group Health insurance, Group Life insurance, Personal Accident and Health insurance and Ordinary insurance payable on the monthly debit basis. He also studied extensively the question of employer-employee relations and agency problems and was recognized as an authority on Pensions and Social insurance.

Mr. Craig was a charter member of the Society. He was active in the Society's affairs from the beginning, served as a member of the council and was President from 1916 to 1918. He became a Fellow, by examination, of the Actuarial Society of America in 1905 and was the President of that Society from 1928 to 1930. He was a Fellow of the American Institute of Actuaries and a member of the International Congress of Actuaries. During the World War he was one of the members of a Committee of Actuaries appointed by the Secretary of the Treasury to study the costs under the War Insurance Act of 1917.

His membership in these various organizations was also an active one as is clearly evidenced by the many papers and discussions he contributed, which embrace practically every phase of the insurance business, in which he was interested.

In spite of his many duties he found time for community affairs and was particularly active in his church and in Y.M.C.A. work in his home town of Ridgewood, N. J. His family life was an ideal one and his home a rendezvous for his wide circle of friends.

Mr. Craig was a most human and kindly man. He was always most approachable. He greatly enjoyed attending the Society's meetings, loved to mix with the other members and made a particular point of getting acquainted with the younger members of the profession. His many accomplishments, his leadership, his kindly disposition, his generosity and thoughtfulness will long be remembered by his host of friends.

OBITUARY

JOSEPH FROGGATT

1868 - 1940

In the death of Joseph Froggatt on September 28, 1940, the Society and the insurance accounting and actuarial profession, as well as the insurance business as a whole, suffered a severe loss.

Born in England May 18, 1868, Mr. Froggatt came to this country at the age of 19. After spending several years in Chicago he moved to East Orange, New Jersey, about 40 years ago. He was in the insurance business for about 16 years before founding the insurance accounting and actuarial firm of Joseph Froggatt & Company, Inc. of which he was President. This firm was eminently successful in its field and now has branch offices located in all important insurance centers throughout the country.

Mr. Froggatt was elected a Fellow of this Society in 1916. He took a great interest in the welfare of the Society and a greater part in its work than the formal record shows. He was also a member of the American Statistical Association, The Insurance Society of New York, The International Association of Casualty and Surety Underwriters, The Casualty and Surety Club and The Institute of Certified Public Accountants of London.

His career was a remarkable demonstration of achievement through unusual talents and sound qualities. Among outstanding features of his character were those affecting his association with co-workers and employees in whatever task was at hand. His keen enthusiasm for his undertakings and his power for inspiring his associates with his own zeal, contributed to the solidarity and hence to the efficiency of his working force. He maintained a relationship between himself and the members of his staff which was remarkable for its fine human qualities. Through his sympathetic understanding and fairness in dealing with employees of whatever rank, he won and kept the devotion of his personnel. By these same qualities he earned the deserved admiration and respect of the other members of the actuarial and accounting profession. Thus, respected and beloved in life, he left uncommon inspiration to those who will carry on his work. His death brought deep sorrow to his associates and friends but their lives will always be enriched by memories of him.

OBITUARY

EDWARD T. JACKSON

1881 - 1939

Edward T. Jackson was born in Baltimore, Maryland, November 18, 1881. He was educated in the city schools, graduating from Baltimore City College in 1897.

He entered the Secretary's Office of the Maryland Casualty Company in 1897, becoming Assistant Secretary. About 1912 he created the Statistical Department as a separate division of the company, formulating the routine and systems and applying machine methods where possible.

Mr. Jackson became the first statistician of the Company and continued in that capacity until 1920, when he resigned, to become Statistician of the United States Office of the General Accident Fire and Life Assurance Corporation, Ltd.

He remained in that position until his death on May 8, 1939, which followed a long illness.

He became an Associate of the Society, by examination, and was admitted October 31, 1917. He was associated with Dr. Downey of the Pennsylvania Insurance Department in the devising of Schedule W for the reporting of expense for loading Compensation rates, one of the earliest Schedules of this type adopted. He made no contributions to the proceedings but devoted his considerable talents to company problems. He was a mathematical wizard, rarely using mechanical assistance in addition. He was adept at adding four or five columns of figures mentally in one run.

Mr. Jackson was a friend to the young men under his direction. His generous assistance aided many such. He had always a soft spot for the needy, particularly the aged. His many friends and associates will miss his kind and genial personality.

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RUSSELL O. HOOKER
SOLOMON S. HUEBNER
CHARLES HUGHES
ROBERT S. HULL
BURRITT A. HUNT
ARTHUR HUNTER
WILLIAM A. HUTCHESON
CHARLES W. JACKSON

FELLOWS—CONTINUED

HENRY H. JACKSON
WILLIAM C. JOHNSON
F. ROBERTSON JONES
HAROLD M. JONES
ELSIE KARDONSKY
GREGORY C. KELLY
WILLIAM H. KELTON
A. LOOMIS KIRKPATRICK
MARK KORMES
CLARENCE A. KULP
JOHN M. LAIRD
STEWART M. LAMONT
JOHN R. LANGE
ARNETTE R. LAWRENCE
JAMES R. LEAL
WILLIAM LESLIE
JOSEPH LINDER
EDWARD C. LUNT (Deceased)
DANIEL J. LYONS
WILLIAM N. MAGOUN
RALPH M. MARSHALL
NORTON E. MASTERSON
ARTHUR N. MATTHEWS
EMMA C. MAYCRINK
D. RALPH MCCLURG
M. H. MCCONNELL, JR.
ALFRED MCDOUGALD
ROBERT J. MCMANUS
GUSTAV F. MICHELBACHER
JOHN H. MILLER
SAMUEL MILLIGAN
JOHN A. MILLS
JAMES F. MITCHELL
VICTOR MONTGOMERY
WILLIAM L. MOONEY
GEORGE D. MOORE
ALBERT H. MOWBRAY
LOUIS H. MUELLER
FRANK R. MULLANEY
RAY D. MURPHY
THOMAS M. OBERHAUS
EDWARD OLIFIERS
FRANK J. O'NEILL
ROBERT K. ORR
OLIVE E. OUTWATER
BERTRAND A. PAGE
SANFORD B. PERKINS
W. T. PERRY (Deceased)
FRANCIS S. PERRYMAN
JESSE S. PHILLIPS
SAMUEL C. PICKETT
SYDNEY D. PINNEY
DUDLEY M. PRUITT
FREDERICK RICHARDSON
OTTO C. RICHTER
ROBERT RIEGEL
RAINARD B. ROBBINS
WILLIAM F. ROEBER
EMIL SCHEITLIN
GEORGE L. SHAPIRO
DAVID SILVERMAN
ROBERT V. SINNOTT
ALBERT Z. SKELDING
EDWARD S. SKILLINGS
JACK J. SMICK
SEYMOUR E. SMITH
JOHN B. ST. JOHN
EDWARD C. STONE
WENDELL M. STRONG
WILLIAM RICHARD STRONG
THOMAS F. TARBELL
JOHN S. THOMPSON
JOHN L. TRAIN
ANTONIO T. TRAVERSI
NELS M. VALERIUS
HIRAM O. VAN TUYL
ALAN W. WAITE
HARRY V. WAITE
LLOYD A. H. WARREN
ALBERT W. WHITNEY
HARRY V. WILLIAMS
HERBERT E. WITTICK
LEE J. WOLFE
ARTHUR B. WOOD

ASSOCIATES

Milton Acker
Saul B. Ackerman
Samuel N. Ain
Austin F. Allen
Robert E. Ankers
A. Edward Archibald
Arthur L. Bailey
James C. Barron
Arthur E. Bateman
Bruce Batho
W. Harold Bittel
Nellas C. Black
John M. Blackhall
Edward L. Bomse
Perry S. Bower
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Louis Buffler
James M. Bugbee
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S. T. Chen
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Morris Kolodritzky
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Julius Lieblein
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Joseph P. Moore
Rolland V. Mothersill
Robert J. Myers
Fritz Muller
S. Tyler Nelson
William Newell
Karl Newhall
Earl H. Nicholson
Walter E. Otto
Donald M. Overholser
Richard M. Pennock
Stefan Peters
John H. Phillips
Morris Pike
Kenneth B. Piper
William A. Poissant
William F. Poorman
Sylvia Potofsky
John M. Powell

ASSOCIATES—CONTINUED

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JOSEPH RAYWID
HARRY F. RICHARDSON
JAMES A. ROBERTS
HARRY M. SARASON
ARTHUR SAWYER
EXEQUIEL S. SEVILLA
NORRIS E. SHEPPARD
JOHN L. SIBLEY
ARTHUR G. SMITH
WILLIAM F. SOMERVILLE
ARMAND SOMMER
ALEXANDER A. SPEERS
HAROLD S. SPENCER
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HUGH E. STELSON
KENDRICK STOKE
WALTER F. SULLIVAN
ARTHUR E. THOMPSON
FREDERICK H. TRENCH
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CHARLES S. WARREN
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MAX S. WEINSTEIN
EUGENE R. WELCH
ALEXANDER C. WELLMAN
WALTER I. WELLS
CHARLES A. WHEELER
FRANK G. WHITBREAD
WILLIAM R. WILLIAMSON
J. CLARKE WITTLAKE
DONALD M. WOOD
DONALD M. WOOD, JR.
MILTON J. WOOD
CHARLES E. WOODMAN
BARBARA H. WOODWARD
JAMES M. WOOLERY

ABSTRACT FROM THE MINUTES OF THE MEETING

NOVEMBER 15, 1940

The twenty-seventh annual (fifty-fifth regular) meeting of the Casualty Actuarial Society was held at the Hotel Biltmore, New York, on Friday, November 15, 1940.

President Perryman called the meeting to order at 10:20 A. M. The roll was called, showing the following forty Fellows and fifteen Associates present:

FELLOWS

AINLEY	ELLIOTT	MAYCRINK
BARBER	FARLEY	MILLS
BERKELEY	FONDILLER	OBERHAUS
BLANCHARD	GODDARD	ORR
BROWN, F. S.	GRAHAM, C. M.	PERRYMAN
CAHILL	GREENE	PINNEY
CARLSON	HAUGH	PRUITT
CLEARY	HOBBS	SINNOTT
COMSTOCK	KELLY, G. C.	SMICK
CONSTABLE	KARDONSKY	SMITH
DAVIS, E. M.	KORMES	VALERIUS
DEKAY	LINDER	VAN TUYL
DORWEILER	MARSHALL	WILLIAMS
	MASTERSON	

ASSOCIATES

BAILEY	GROSSMAN	PETERS
BARRON	HIPP	ROSENBERG
BLACK, N. C.	JOHNSON	STOKE
BLACKHALL	KELLY, R. G.	WARREN
FITZ	MARSH	WILLIAMSON

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

Mr. Perryman read his presidential address.

The minutes of the meeting held May 17, 1940 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 Seventh Edition of the Recommendations for Study had been published and are effective for the 1941 examinations.

The following Associates had passed the necessary examinations and had been admitted as Fellows:

GEORGE B. ELLIOTT JARVIS FARLEY SEYMOUR E. SMITH

The following candidates had passed the necessary examinations, had met the experience requirements and had been enrolled as Associates:

BRUCE BATHO ELI A. GROSSMAN STEFAN PETERS
JOHN M. BLACKHALL ROGER A. JOHNSON, JR. NORMAN ROSENBERG
ROBERT G. KELLY

The following candidates had been successful in completing the examinations for Associates, but had not been enrolled by reason of the terms of Examination Rule 4:

WILLIAM W. FELLERS S. W. GINGERY F. E. SATTERTHWAITE

Diplomas were then presented by the President to George B. Elliott, Jarvis Farley, and Seymour E. Smith, who had been admitted as Fellows under the 1940 examinations.

The President announced the deaths, since the last meeting of the Society, of three Fellows, James D. Craig, Joseph Froggatt, and Robert J. Hillas, and that memorial notices would appear in this Number.

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

CASUALTY ACTUARIAL SOCIETY

Annual Report of Finances

Cash receipts and disbursements from October 1, 1939 to September 30, 1940

Income

On Deposit on October 1, 1939 in Marine Midland Trust Company		$1,059.52
Members Dues	$2,465.00	
Sale of Proceedings	1,210.53	
Examination Fees	918.00	
Luncheons and Dinners	639.00	
Interest and Miscellaneous	58.12	
Michelbacher Fund	160.00	5,450.65
Total		$6,510.17

Disbursements

Printing and Stationery	$2,675.99
Postage, Express, etc	125.00
Stenographic Services	420.00
Library Fund	29.19
Luncheons and Dinners	1,047.92
Examination Expense	754.09
Insurance	36.95
Miscellaneous	240.43
Total	$5,329.57
On deposit on September 30, 1940 in Marine Midland Trust Co.	1,180.60
Total	$6,510.17

Income	$5,450.65	
Disbursements	5,329.57	
Excess of Income over Disbursements		$ 121.08
1939 Bank Balance		1,059.52
1940 Bank Balance		$1,180.60

Assets

Cash in Bank		$1,180.60
*Bonds		4,750.00
Total Assets		$5,930.60

* Includes Michelbacher Fund $1,300.59

The Auditing Committee (W. P. Comstock, Chairman) reported that the books of the Secretary-Treasurer had been audited and his accounts verified.

The Examination Committee (Mark Kormes, Chairman) submitted a report of which the following is a summary:

1940 EXAMINATIONS—SUCCESSFUL CANDIDATES

The following is a list of those who passed the examinations held by the Society on May 15 and 16, 1940.

ASSOCIATESHIP EXAMINATIONS

PART I:

Robert D. Acker
Edward S. Allen
Clark J. Bailey
Robert D. Bart
John K. Bash
John R. Bevan
John E. Bilsborrow
Frank E. Dodge
Harold C. Dunn
Patrick F. Farrelly
Jesse Feld
Leonard J. Fondiller
S. W. Gingery
Foster C. Greene
Benjamin Harmatz
Raymond Houseman
Roger A. Johnson, Jr.
W. E. Jones
Leonard S. Levi
John H. Lewis
Burton I. Maynard
John C. Morris
Emil T. Norberg
Monroe L. Norden
Robert C. Perry
Rolland Poirier
Helen R. Quirk
Irving Rosenbloom
Franklin E. Satterthwaite
Edwin G. Schuck
Darrison Sillesky
Ivar E. Strand
Margery Tyrrell
Ralph E. Wareham
John H. Williams

PART II:

Robert D. Acker
John K. Bash
John R. Bevan
John E. Bilsborrow
John M. Blackhall
A. Arthur Charous
Frank F. Dodge
K. Arne Eide
S. W. Gingery
M. Brenn Green
Gerald D. Groden
Ernest Holzinger
Raymond Houseman
Bela A. Lengyel
Burton I. Maynard
Jeanne S. Pearlson
Stefan Peters
Robert F. Rich
Irving Rosenbloom
Franklin E. Satterthwaite
Irving Stein
Ivar E. Strand
Elia Vergano
Ralph E. Wareham
John H. Williams

PART III:	ROBERT D. ACKER	RAYMOND HOUSEMAN
	WILLIAM W. FELLERS	FRANK H. PURINGTON, JR.
	S. W. GINGERY	IRVING ROSENBLOOM
	FOSTER C. GREENE	FRANKLIN E. SATTERTHWAITE
PART IV:	ROBERT D. BART	LEONARD S. LEVI
	ROBERT DORFMAN	NORMAN ROSENBERG
	WILLIAM W. FELLERS	FRANKLIN E. SATTERTHWAITE
	S. W. GINGERY	DONALD J. TEVLIN
	ROBERT G. KELLY	

FELLOWSHIP EXAMINATIONS

PART I:	GEORGE B. ELLIOTT	SEYMOUR E. SMITH
PART II:	GEORGE B. ELLIOTT	SEYMOUR E. SMITH
	JARVIS FARLEY	
PART III:	GEORGE B. ELLIOTT	SEYMOUR E. SMITH
	MORRIS KOLODITZKY	
PART IV:	GEORGE B. ELLIOTT	SEYMOUR E. SMITH

In accordance with the Constitutional requirements notice of the following proposed amendment to the Constitution was given. This amendment was, on motion, adopted to read as follows:

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.

The Council's election of Clarence W. Hobbs as Editor and of Thomas O. Carlson as Librarian, was announced.

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

President	SYDNEY D. PINNEY
Vice-President	HAROLD J. GINSBURGH
Vice-President	JAMES M. CAHILL
Secretary-Treasurer	RICHARD FONDILLER
Editor	CLARENCE W. HOBBS
Librarian	THOMAS O. CARLSON

Members of Council (terms expire in 1943):

RUSSELL P. GODDARD PAUL DORWEILER CHARLES M. GRAHAM

Member of Council (term expires in 1942):

JOHN A. MILLS

Member of Council (term expires in 1941):

ARTHUR E. CLEARY

The presentation of new papers was begun.

Recess was taken for lunch at the Hotel until 2:15 P. M.

A Question Box on selected subjects was participated in by a number of members and representatives of insurance organizations.

The presentation of new papers was completed.

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

Representatives of Casualty Companies and Organizations Present

Ellis K. Carson, Royal Indemnity Company, New York.

William F. Dowling, Assistant Treasurer, Lumber Mutual Casualty Company, New York.

Ernest A. Erickson, Underwriter and Statistician, Utilities Mutual Insurance Company, New York.

Myrtle Snyder Kelly, Statistician, Pennsylvania Compensation Rating & Inspection Bureau, Philadelphia, Pa.

Frederick C. Kessler, Secretary-Treasurer, Consolidated Taxpayers Mutual Insurance Company, Brooklyn, N. Y.

F. Kirchstetter, Utilities Mutual Insurance Company, New York.

Arthur H. Reede, Associate Professor of Economics, Pennsylvania State College, State College, Pa.

Henry D. Sayer, General Manager, Compensation Insurance Rating Board, New York.

L. W. Scammon, Statistician, Massachusetts Rating & Inspection Bureau, Boston, Mass.

A. Seymour, Royal Indemnity Company, New York.

P. E. Sheaffer, Lumbermens Mutual Casualty Company, Philadelphia, Pa.

E. H. Zimels, Statistician, Consolidated Taxpayers Mutual Insurance Company, Brooklyn, N. Y.

VOL. XXVII, PART II NO. 56

PROCEEDINGS

MAY 16, 1941

THE EXPENSE PROBLEM IN CASUALTY INSURANCE

PRESIDENTIAL ADDRESS BY SYDNEY D. PINNEY

With becoming modesty, members presenting papers for our consideration often express the hope that their contributions, while possibly not of great value in themselves, may stimulate others to probe more deeply and more successfully into a particular subject and thereby produce some really worthwhile results. The degree to which such stimuli are effective in producing further thought and research among our membership not only measures the excellence of the original contribution but also currently reflects our activity, individually and collectively. Surely, it will be a sad day indeed, when, like the rare beauty of the night-blooming cereus, the thoughts expressed by authors of papers are lost on the midnight air of indifference. Whether agreeing with the conclusions advanced or disagreeing therewith, each one of us should take a real interest in many of the subjects presented and, whenever possible, make an effort to reduce his own observations to writing so that others may have the benefit of such further study. The presentation and discussion of appropriate papers is an effective means of promoting actuarial and statistical science as applied to the problems of casualty and social insurance, and therefore it is to be greatly desired that a larger proportion of our membership avail themselves of this medium for expressing their ideas. The more recent members should be encouraged in this direction and the older members should be reminded of this privilege. Our Society will show real vitality, when, instead of striving to induce members to present papers, we are confronted with the more agreeable task of selecting those papers which are most excellent among many submitted.

Lest I be accused of preaching that which I do not practice, I have decided to deal in this address with a specific problem rather

than generalize. In fulfillment of the obligations of my office, I am required to write something anyway, but while admitting the necessity, may I say in defense that, at least, I have reacted positively to the stimulus given by others in our Society who have written on this subject. Credit for the immediate stimulus should be given to the thoughts expressed by my predecessor, Mr. Francis S. Perryman, in his address presented at the November, 1940, meeting of the Society. My present endeavor will be to build further on the base of certain fundamentals which he so ably set forth.

The Problem

Without exception, each one who has previously written in our *Proceedings* on the subject of expense allocation for casualty insurance has recognized the need for an improvement in the cost accounting methods followed by the companies. Not only is it necessary to provide for a more correct assignment of expenses to the individual lines of insurance and to classifications within each line, but it is of even greater importance that we continually examine our methods of conducting business to reduce costs to the lowest level compatible with economic considerations. Finally, we must determine the most equitable method of assessing these costs among the various classes of insurance buyers. The solution of this three-fold problem must be capable of satisfactory demonstration to all concerned,— the companies, the state authorities and the policyholders. It is evident that the solution of any one part of the problem, while in itself a step in the right direction, will not bring our efforts to a proper termination.

The need for solving this problem has been emphasized by developments during the recent past. The general economic depression of the last decade has caused purchasers of insurance to be more analytical of the price they are asked to pay. Recurring agitation for the creation of monopolistic state insurance funds for workmen's compensation coverage and, more recently, for compulsory automobile liability insurance has required a defense of insurance companies and their methods, including the expense of operation. The introduction of retrospective rating and proposals to graduate expenses by size of risk have directed attention

to the expense element in the insurance premium. The proposal to grant a substantial rate credit in connection with fire insurance on properties mortgaged by the Home Owners Loan Corporation, in recognition of services rendered, drew attention once again to the matter of expenses. The cost of insuring workmen's compensation and liability coverages for National Defense projects has been subjected to criticism, particularly as respects the loading for expenses. Of possibly less direct bearing on the subject, but none the less important by virtue of the implications involved, is the recent federal investigation of life insurance conducted by the Securities and Exchange Commission (SEC), under direction of the Temporary National Economic Committee (TNEC). There are probably other influences at work, but those mentioned are sufficient to indicate the need for ranking this problem as one of current importance.

It appeals to me that here is an opportunity for the actuaries, accountants and statisticians of casualty companies to perform a real service for the business and it is my hope that the members of our Society will play a leading part in this endeavor.

The magnitude of the task of solution, with all its ramifications and controversial points, must not deter us from the undertaking. The complete answer will not be obtained without much research and intelligent analysis, supported by a greater degree of cooperation on the part of all classes of insurance carriers than has obtained in the past. The producers,— brokers and agents of all classes,— are vitally concerned and the problem cannot be equitably solved without their assistance. It is not to be expected that our initial efforts will meet with complete success, but the start must be made and, in my opinion, the sooner the better. Let us approach the problem with open minds, discarding preconceived ideas if they do not square with the facts and relegating partisan considerations to the background, insofar as is humanly possible. From a purely selfish viewpoint, the companies should welcome such a study in order that the results may be available to answer adverse criticism from whatever source it may emanate. It may be expected that unless we take steps to solve the problem, some other agency, possibly less qualified, will eventually be called upon to do so.

As an approach to the problem, I am presenting for your con-

sideration certain observations and suggestions as to the procedure which might be followed in arriving at a solution. Please bear in mind that these are only suggestions. Undoubtedly there are other methods which will occur to us as we proceed and which will be more desirable. For convenience in keeping before you the three aspects of the problem, I have grouped these comments and suggestions under their respective headings, but it should be borne in mind that the study of each part of the problem may be undertaken concurrently with the others, at least to the extent that they are not dependent upon the results previously to be determined for another part.

It is suggested that the problem be studied first as respects workmen's compensation insurance. This suggestion is made for several reasons. In the first place, the problem is most acutely in need of solution for this line, if recent developments are any indication. Secondly, there is a greater range in the size of premium by risk and more pronounced variations in the aggregate premium volume and in the expense ratio, from year to year, than in the case of other lines of casualty insurance. Thirdly, there is a central rate-making organization, the National Council on Compensation Insurance, which embraces in its membership all classes of carriers and therefore is in a better position to make this study for compensation insurance than would be the case with other rating organizations for other lines. The investigation could be supervised by the Rates Committee of the National Council, with a special sub-committee of actuaries, accountants and statisticians set up for this purpose. It would be expected that many of the conclusions reached by this committee would be helpful in subsequent studies of the problem for other lines of insurance. Such studies for the other lines could be made by appropriate committees representing the various rating organizations having jurisdiction, in order to secure the necessary cooperation among carriers. Acquisition cost analysis will require special consideration and it is suggested that this phase of the problem be dealt with by an appropriate committee representing the companies which operate primarily through commission agents and brokers, such committee to collaborate with representatives of producers' organizations whose views and cooperation should be solicited in arriving at a satisfactory solution. The Acquisition Cost Conference should

play an important part in connection with this particular phase of the problem.

Distribution of Expenses

Our *Proceedings* contain a number of excellent papers dealing with the distribution of expenses to line of insurance, considered from both the theoretical and practical points of view. Other organizations such as the Association of Casualty and Surety Accountants and Statisticians have given considerable thought to standardizing methods of such distribution for its members. It is my feeling, however, that there is still further room for improvement in the establishment of uniform methods which will produce consistent results. The first approach should necessarily be from the theoretical viewpoint with a subsequent fitting of theory to practice in so far as can be realized. A correct distribution of expenses to line of insurance is necessary in order to permit a comparison with the charges made to the insuring public, and thus serve as the basis for making such adjustments as may be indicated to reflect the true costs in such charges. Furthermore, it is important that we analyze our expense distribution within each line of insurance. A correct distribution by class of business may demonstrate that we are charging certain classes too much and sustaining a loss on other classes. The point has been made in previous papers that it is not sufficient to distribute expenses simply in proportion to premium volume. Methods, in detail, have been suggested for distributing various elements of expense and the committee making this study should carefully investigate these suggested methods and determine which will produce the most accurate distribution.

In carrying out this investigation the committee will be faced with the necessity of recognizing different operating methods followed by the individual companies. It is not contended that the ultimate goal is to produce uniform costs for each item of expense for each classification of business, regardless of the manner in which the individual company operates. It is my belief, however, that for a given method of operation the distribution of expenses to line and classification should follow some uniform procedure. A good example of what I have in mind is the treatment of claim

adjustment expense. There is considerable variation among companies in the method of adjusting claims,— some companies making use of the services of independent claim adjusters and legal firms to a larger degree than others which handle the bulk of their claims through claim adjusters in the employ of the company. In general, a greater proportion of the claim expense incurred by independent adjusters and legal firms is allocated to the individual claim than is the case with respect to the expense of salaried company claim adjusters which is primarily treated as unallocated claim expense. It is evident that allocated claim expenses may be readily distributed to line of insurance and classification but a special analysis must be made in order to distribute the unallocated claim expense items. Unless such distribution of the unallocated items is made properly, the value of comparing the cost of the two methods of claim handling will be impaired.

In referring to classifications, I have in mind going beyond the classification of risks as customarily set forth in the rate manuals. The manual classifications have been established primarily upon a consideration of the nature of operations or the product manufactured and the loss hazards involved. When we give consideration to the expense element, however, other factors demand recognition. It is recognized that we cannot refine our methods to the point where the expense dollars are distributed by risk in a manner similar to that which is possible as respects losses. However, it would seem altogether feasible to establish cost accounting methods which would permit the determination of expenses for groups of risks which involve approximately similar costs to the company. This would involve a recognition of differences in servicing costs required by the nature of the risks' operations as well as differences in administrative costs due to factors such as the size of the risk and the coverage afforded under the insurance contract. After agreeing on such a grouping of risks for expense investigation, the analysis for each group should be made by means of direct charges for those items of expense which can be reasonably distributed on such basis plus indirect charges which may properly be superimposed upon the direct charges. Suitable time studies should be made wherever feasible in order to determine the proper distribution of expenses to the various groups of risks. Salary costs constitute a major portion of the expenses of

the insurance company and the correct distribution of salaries will in many cases afford a reasonable basis on which to distribute other costs. This is not true as respects all expense items but a correct distribution of salary costs will go a long way toward solving the problem.

It should be noted that I do not advocate breaking down expenses by geographical territories. It is my feeling that, if we can determine with reasonable accuracy the distribution of expenses by line of insurance and by classification within each line, we shall have produced a defensible distribution of expenses by state. It is recognized that there are variations in costs dependent upon the location of the risk, as for example, whether it operates on an interstate or intrastate basis, whether it is readily accessible for servicing, etc., but such variations are not susceptible to analysis on a practical basis. Differences in costs due to special state requirements, such as premium taxes, licenses, fees and assessments, may be reflected in the premium charges allocated to the individual states, without any particular difficulty.

Previous investigations which have been made for the purpose of distributing expenses by size of risk have been limited to workmen's compensation insurance. The results indicated by such investigations have been questioned, although, so far as I know, the critics have not presented results based upon an independent investigation of such expense distribution. What I am now proposing is that all carriers lend their support to such investigations and that a start be made *de novo* to produce results which will be accepted by the business as a whole as being in accord with the facts in so far as they can reasonably be determined.

Level of Expenses

Up to this point I have dealt briefly with the distribution of expenses as actually incurred by the companies. I shall now discuss the second phase of the problem dealing with the examination of the level of expenses incurred under present operating methods. This part of the problem will undoubtedly be the most difficult of satisfactory solution since there must be taken into account variations in operating methods of the companies, distribution of business by classification by company, variations in

methods of acquiring business and variations in company policy with respect to salary levels and employee benefit plans such as pensions, group insurance and other welfare work. The preliminary study of the distribution of expenses to line of insurance and classifications within lines will be of value in approaching this second step. For example, it may be found that the reason for differences in expense ratios between carriers is to some extent, at least, influenced by a difference in the distribution of business by classification. At this point, I would like to make the observation that a comparison of expense ratios by company will not be properly made unless the expenses are related to premiums on a comparable rate level. It may be preferable to relate expenses to some other standard base, such as risk payrolls or number of units insured, which will be uniform for all companies.

The committees in charge of this investigation should make a comprehensive study of operating methods to determine, if possible, the most efficient basis of conducting the business. Manufacturers of business machines and mechanical tabulating equipment have played an important part in standardizing operating methods. The Association of Casualty and Surety Accountants and Statisticians has likewise cooperated with its members in pooling ideas and exchanging information which has been most beneficial. Consulting actuaries and accounting firms have undoubtedly operated to improve the general situation. It is felt, however, that, through committees such as suggested, it would be possible to bring about even greater improvement in the efficient operation of casualty companies as a whole. It is not to be expected that all companies will choose to operate on exactly the same basis. However, the goal should be to make available to all carriers the latest information on successful operating methods, in the hope that these would be applied to as many operations as are common to all companies. I do not consider that there is anything radical or unsound in this suggestion. We see evidence of this sort of cooperation in other industries,— an outstanding example of which is the automobile manufacturing industry. Surely, no one believes that one company can hope to retain to itself a permanent advantage based upon some unique method of operating which will remain unknown to the other companies in the business. It seems to me that for the most part the coopera-

tive efforts of casualty insurance companies have been limited to the compilation of loss experience statistics and the development of manual rules, rates and rating plans, but comparatively little consideration has been given to combining forces in the study of expense costs. If through such efforts there can be effected a real saving in operating expenses, the favorable impression created with state authorities and the public at large should react to the advantage of all the companies.

It is not my intention to prejudge the situation and, therefore, I do not claim that the present expense ratio is either too high or too low. I have been impressed, however, with the variation in expense ratios between companies and this has suggested the desirability of a cooperative study of operating costs. For example, as respects compensation insurance, the New York Casualty Experience Exhibit for calendar year 1940 indicates that for the fifteen largest stock carriers and eight largest mutual carriers, which together write approximately 80% of the total compensation business for companies entered in New York (exclusive of reciprocals and the New York State Fund), the ratio of claim expense to incurred losses ranged from 10.7% to 21.2%. It is also interesting to note that the remaining companies (exclusive of reciprocals and the New York State Fund) produced a higher ratio of claim expense to incurred losses than was indicated for the larger carriers. As respects general administration expense, there was a range among the larger companies from 3.4% of earned premiums to 11.4%. The smaller companies showed a higher administration expense ratio than the larger carriers. On the other hand, ratios of inspection expense and production cost, other than commissions, were lower for the smaller companies than for the larger carriers. The total expense ratio of the smaller stock companies was higher than that of the larger stock companies, and the same situation applied to a somewhat greater extent in the case of the mutual companies. For automobile liability insurance, the total expense ratio was the same for the larger and smaller stock companies but higher for the smaller mutual companies as compared with the larger mutual companies. In the case of liability other than automobile, the smaller companies produced lower total expense ratios than the larger companies for both the stock and mutual groups. There is appended

an exhibit which shows in detail the comparative expense ratios of stock companies and mutual companies subdivided between the larger and smaller carriers for the three lines mentioned. Admittedly, I have not made a comprehensive analysis since my observations are limited to an examination of but one year's results, but I mention these comparisons as evidence of the need for a study of operating expenses.

An analysis of production costs will require special consideration, particularly in view of the various methods followed by the companies in acquiring business. It is suggested that for this purpose the companies be grouped according to production methods and that each group make a study of the costs involved for its particular method of business development. This should go further than a mere tabulation of commissions, branch office salaries and other expenses. The ultimate goal should be to determine whether the expenditures made under a given system are in line with value received, not only by the company but by the policyholder as well. Agency and branch office costs for each line of business should be analyzed to determine the breakdown to new business and renewals, taking into account size of policy where it is important. A segregation should be made of the cost of agency development and of such portion of servicing and underwriting operations performed in agencies and branch offices as is properly chargeable to field supervision cost.

Comparison of costs between agencies and branch offices will be available as the result of such study, based upon a uniform method of cost analysis. It is interesting to note that at the joint convention of the International Association of Casualty and Surety Underwriters and the National Association of Casualty and Surety Agents which took place on October 10, 1940, the agents adopted a resolution calling for a determination of the cost of doing business, both in branch offices and general agencies, with the suggestion that this study be made by an independent nationally known public accountant authority. This suggested method of conducting the cost analysis should be analyzed and discussed with the appropriate committee representing producers' associations. It is my opinion that it would not be necessary to delegate this study to an independent public accounting firm since it should be possible for qualified representatives of the companies

and the producers' organizations to agree upon a satisfactory basis of cost analysis. I have in mind the studies which have been made by the Life Insurance Sales Research Bureau analyzing the costs of general agencies and branch offices engaged in the production of life insurance, and it would seem that we could devise a satisfactory method patterned somewhat upon that investigation.

In the final analysis we should be governed by the fundamental principle that production costs must be justified on the basis of service rendered to the policyholder. The assured, rather than the insurance carrier, actually pays the acquisition cost. This principle is most clearly brought to light in those cases where an assured purchases his insurance from a carrier which does not operate through commission agents or brokers but where the policyholder pays a service fee direct to the agent or broker. If the producer performs certain special services he should be appropriately recompensed on the same basis as the corresponding charge which would be made by the insurance carrier if it were to perform the same service. Care should be exercised, however, that there is not an uneconomical duplication of effort since excessive commissions and other redundant production costs cannot be supported by the rating procedure. On the other hand, the charges for legitimate acquisition expenses should not be pitched at a level below cost. It is to ascertain the proper level of reasonable costs that this analysis of agency and branch office expenses is proposed.

Another aspect of this study of expenses is the effect of variations in premium volume upon the expense ratio. Such fluctuations in premium volume are due to a variety of causes such as underlying economic conditions, as illustrated by the sharp decline in payrolls and insured automobiles during periods of industrial depression; changes in rate levels and rating plans; changes in the underwriting policy of the individual company; and changes in the competitive situation. As respects reductions in premium volume which are beyond their control, the companies are faced with the problem of keeping the expense ratio within reasonable limits. It may be argued that the expense ratio should be considered from the standpoint of the average over a sufficiently long period so that the effect of fluctuations in premium volume may offset one another. The theory underlying this view-

point is sound, but it is not always followed in practice since the tendency is to consider that a low expense ratio, produced during a period of expanding premium volume, represents economical operation permitting a more liberal underwriting policy, rather than to consider that the savings during the favorable years should be set aside to offset an excessive expense ratio during a subsequent period of falling premium volume.

It is interesting to note that during the period from 1925 to 1929 the workmen's compensation premium volume for all companies, excluding reciprocals and state funds, increased approximately 34%, but during this period expenses likewise increased approximately 32%. During the depression period from 1929 to 1933 the corresponding premium volume decreased 46% while expenses decreased 38%. During the business revival from 1933 to 1937 the premium volume increased 97% and expenses increased 57%. From 1937 to 1940 the premium volume increased 2.5% and expenses increased about 7.5%. Segregating acquisition cost from other expenses produces some interesting comparisons of the manner in which other expenses fluctuate in relation to changes in premium volume. As would be expected, the variation in acquisition cost follows more closely the changes in premium volume, particularly in the case of the stock companies. I have appended an exhibit showing the correlation of changes in premium volume and expenses for the periods already mentioned, with the results shown separately for stock companies and mutual companies as well as combined for all companies. Further analysis may produce information which will be helpful in controlling expenses.

A study of the manner in which costs vary per unit of coverage during periods of economic depression or business revival, as well as in terms of ratio to premiums, should prove of value. Costs of administration, servicing and production coincidental with business expansion or contraction due to changes in company underwriting policy or in the competitive situation should also be investigated. In this connection the effect of competition upon company costs should receive special consideration. Competition may be beneficial or detrimental to the interest of policyholders and to the insurance business as a whole, dependent upon the degree of control exercised by the companies and their producers.

We all are familiar with the pernicious effect of unbridled cut-rate competition. The casualty lines are probably more susceptible to competitive abuses than is the case with life insurance, due to the fact that the policies are short-term contracts. It is appreciated that there are fundamental differences between casualty insurance and life insurance which require that most of the casualty coverage be written on a short-term basis. In casualty insurance there is a greater degree of continuous service to the policyholder in the prevention of accidents or claims and in the adjustment of those claims which do arise during the policy period, whereas in life insurance, other than group, the service is of a different character, since there is usually but one claim which arises upon the death of the assured and terminates the coverage. In life insurance the switching of insurance from one carrier to another is reduced to a minimum, whereas in casualty insurance the company and the producer must be ever on the alert to retain its business. It may be argued that this condition of "eternal vigilance" can only be beneficial to the policyholders, but there is some doubt in my mind as to whether the cost which must ultimately be passed on to the policyholders may not actually offset the alleged advantages. The study of costs should enable the companies and producers to judge more intelligently whether present practices are satisfactory in this respect.

The thought is often expressed that, in the long run, competition will establish a proper control over insurance costs since the company which is charging too much for its services will eventually lose its business to a company charging on a more reasonable basis. The trouble is that competition may proceed too far and too rapidly, with the result that eventually certain companies will find themselves in financial difficulties. It is to prevent this that we have rate regulation by state authorities and have established certain standard policy provisions, rate-making procedures and underwriting rules. These safeguards, however, do not eliminate the possibility of uneconomical competitive practices which tend to increase the cost to the consumer. It is my belief that the remedy lies in improving the technique of rate making, including the establishment of more flexible rating plans, so as to bring the insurance premiums more in line with the actual costs for each classification of risks. If this could be accomplished, I believe

that there would not be the abnormal competition which results from a disparity between price and value.

Expense Loading

This leads to a consideration of the third phase of the problem, namely, the matter of determining the manner in which the loading for expenses is to be incorporated in the insurance premium. After we have satisfied ourselves that the expenses have been allocated properly by item to the various lines of casualty insurance and to the classifications within each line, and that the expenses are on a reasonable cost level, we must then decide how they shall be equitably assessed among the various classes of policyholders. Each line of insurance will require its own special treatment, dependent upon the variation in costs by classification and the character of the expenses themselves. Here again the approach should be from the theoretical viewpoint, with an ultimate transition to practical considerations.

It has been suggested that under a free competitive system the companies should be permitted to establish their own individual expense loadings to be superimposed upon the average loss costs. With the multiplicity of risk classifications in the casualty lines, it would seem that if this procedure were followed the state supervisory authorities would be confronted with a tremendous task in determining whether the rates charged by the individual company met the necessary requirements as to adequacy and reasonableness. In view of the short-term nature of casualty insurance coverage and the frequent revisions of rates, it is evident that such a system would greatly complicate the rating procedure. Furthermore, the promulgation of experience adjusted rates for the larger risks in certain casualty lines would be practically impossible. A more practical solution would be to establish the expense loadings on the basis of the average necessary costs for the various classes of risks. There would be but one method of expense loading for a given line of insurance, but the ultimate goal should be to establish this method on such a basis that each carrier, regardless of the classes of business which it might underwrite, would receive reasonable amounts for its expenses. The expense loadings would not necessarily reflect the level required by the carriers which

operate on the most efficient basis, nor should they be keyed to the level of the least efficient operators. If the average expenses represent a reasonable level of cost for the services rendered the policyholders, the expense loadings established on this basis should prove satisfactory to all concerned, while at the same time permitting free competition on a controllable basis.

The contention might be made that it would be more in the public interest to fix the expense allowance at the level indicated by the company having the lowest expense ratio, the reasoning being that if such company by virtue of superior operating efficiency or cheaper costs is able to make a reasonable profit at a lower than average level of rates, the public should be permitted to buy insurance at such rates and not be forced to pay a higher price. At the outset, this might prove satisfactory but over a period of years the effect might prove disadvantageous to the insuring public. There is the possibility that this would result in granting a monopoly to the company having the lowest operating cost, since the other companies would not find it profitable to continue in business. Also, it might be found that the lower operating costs were dependent upon a restricted or selective underwriting policy or even might be due to less comprehensive service rendered to policyholders. The public would be deprived of the advantages of a free competitive market and of the opportunity to purchase a superior brand of service. Rate regulation by state authorities should not operate in such a manner that such a condition could obtain. On the contrary, rate regulation should be such that the expense allowance in the premiums will be sufficiently adequate to permit a prudently managed company to provide the degree of service desired by all classes of the insuring public as a whole. The use of average company expense ratios for the various classes of business would meet this criterion in a reasonable manner.

It may be found that the traditional method of expense loading, under which the loss portion of the rate is increased by a uniform percentage, should be supplanted by a substantially different process. This immediately raises a question as to the intrinsic value of a uniform percentage expense loading for a line of insurance as a whole. This basis has served a very useful purpose in the past, since it permits a ready comparison of the actual loss

and expense ratios with the average permissible amounts. On the other hand, the introduction of loss and expense constants, retrospective rating and graduated expense plans tend to throw this basis of comparison out of line and it may be that we have reached a point where we should seek a different basis of comparing actual results with those expected. The importance of this consideration will depend largely on the degree to which the present system of expense loading may be modified. At any rate, the desire to maintain the present basis of comparison, *per se*, does not constitute a valid reason for not changing the basis of charging expenses in the insurance premium if, as a result of our studies, we discover a more equitable basis.

Many of the questions which arise in the solution of this phase of the expense problem are inter-related and, therefore, the final solution must be the one which most equitably recognizes each of the individual considerations in a practical manner. Some of the questions which suggest themselves as being worthy of investigation are the following:

1. Does the present method of using a uniform percentage expense loading, irrespective of the amount of the classification rate, produce equitable results for risks whose rates are substantially higher or lower than the average?
2. Should expenses, in whole or in part, be provided for in proportion to units of exposure regardless of fluctuations in loss experience? For example, in determining compensation rates, should the expense loading be provided for partly as a charge per $100 of payroll and partly as a percentage of the final rates?
3. In applying experience rating, should the expense portion of the premium, with the exception of taxes and possibly claim adjustment expenses, be stabilized on the basis of units of exposure instead of varying with the experience rating modification determined by the loss experience of the risk? This is suggested by the fact that in the retrospective rating procedure the expense allowance, with the exception of claim expense and taxes, is a percentage of the standard premium and is not influenced by the risk loss experience during the policy period.
4. Is the policy fee or expense constant the most equitable basis of charging for expenses in connection with workmen's compensation policies for the smaller risks and, if so, should this principle be extended to other lines of insurance?

5. Should the percentage basis of paying commissions be modified to provide for a combination of a fixed fee per policy plus a percentage of the premium?
6. In the study of expense loading by size of risk should the charges for inspection and auditing costs be determined by taking into consideration the average time expended in rendering such services per risk and the average service cost per hour, thereby determining the average service cost per risk which could be related either to the risk premium or units of exposure?
7. If a graduation of the expense loading by size of risk is indicated, should the graduation of commissions and other production costs be in proportion to the graduation of other expenses?

It is to be hoped that the answers to these questions will be found as a result of the investigations which have been suggested.

Conclusion

The true concept of insurance contemplates that the losses and expenses shall be equitably distributed among the entire group of insureds. Casualty insurance theory and practice have long recognized the desirability of establishing classifications of homogeneous risks, so that those with a low hazard will not be charged with the losses of those with a high degree of hazard. It is for the purpose of applying this principle to the expense element of the premium that this discussion has been directed. There is nothing unfairly discriminatory or unjust in classifying risks according to their expense requirements. If our investigations are impartially conducted and the results will stand up under the critical scrutiny of state authorities and the insuring public, we should not be fearful of the consequences of endeavoring to reflect such results in the premiums charged our policyholders. It is my hope that these studies may be initiated at an early date, since it is apparent that they will require much time and effort before being brought to a satisfactory conclusion. The longer we delay in arriving at a complete solution to the three-fold expense problem in casualty insurance, the more difficult it becomes adequately to meet criticism directed at the expense element.

ANALYSIS OF EXPENSES—CALENDAR YEAR 1940

COMPARISON OF EXPENSE RATIOS*—BY CLASS OF CARRIER

(DATA DERIVED FROM NEW YORK CASUALTY EXPERIENCE EXHIBIT)

	Commissions	Other Production	Total Production	Claim Adjustment	Administration	Inspection & Bureau	Taxes, Licenses & Fees	Total Other Than Production	Total All Expenses
WORKMEN'S COMPENSATION									
Stock Cos.									
Large	13.4	4.6	18.0	9.2	9.2	2.8	3.8	25.0	43.0
Small	13.6	4.0	17.6	10.3	10.7	2.1	3.8	26.9	44.5
Combined	13.5	4.4	17.9	9.5	9.6	2.6	3.8	25.5	43.4
Mutual Cos.									
Large	0.8	4.5	5.3	6.8	5.8	3.2	2.2	18.0	23.3
Small	4.3	2.0	6.3	7.8	7.9	1.1	4.4	21.2	27.5
Combined	1.2	4.2	5.4	6.9	6.0	3.0	2.4	18.3	23.7
AUTOMOBILE LIABILITY									
Stock Cos.									
Large	19.8	5.2	25.0	11.6	7.3	1.3	3.9	24.1	49.1
Small	19.6	3.9	23.5	11.6	8.5	1.5	4.0	25.6	49.1
Combined	19.7	4.7	24.4	11.6	7.8	1.4	3.9	24.7	49.1
Mutual Cos.									
Large	6.8	6.4	13.2	10.4	7.0	1.0	2.0	20.4	33.6
Small	7.6	3.0	10.6	13.0	7.0	1.7	2.6	24.3	34.9
Combined	6.9	5.9	12.8	10.8	7.0	1.1	2.1	21.0	33.8
LIABILITY OTHER THAN AUTOMOBILE									
Stock Cos.									
Large	21.3	5.5	26.8	13.6	10.0	5.9	4.6	34.1	60.9
Small	22.3	4.2	26.5	12.3	10.6	5.3	4.6	32.8	59.3
Combined	21.6	5.1	26.7	13.2	10.2	5.7	4.6	33.7	60.4
Mutual Cos.									
Large	4.4	4.9	9.3	13.4	8.1	3.9	2.3	27.7	37.0
Small	8.2	2.1	10.3	13.4	7.1	2.0	2.3	24.8	35.1
Combined	4.9	4.5	9.4	13.4	8.0	3.7	2.3	27.4	36.8

*Ratios are expressed as percentages of earned premiums.

ANALYSIS OF EXPENSES—WORKMEN'S COMPENSATION

CORRELATION OF CHANGES IN PREMIUM VOLUME AND EXPENSES

(DATA DERIVED FROM NEW YORK CASUALTY EXPERIENCE EXHIBIT)

Selected Period	Companies	Percentage Increase for Selected Period*									
			Incurred Expenses								
		Earned Premiums	Commissions	Other Production	Total Production	Claim Adjustment	Administration	Inspection & Bureau	Taxes, Licenses & Fees	Total Other Than Production	Total All Expenses
1925 to 1929	Stock	22.2	22.2	45.2	26.4	24.9	30.3	18.0	13.2	24.8	25.4
	Mutual	84.3	70.1	71.6	71.2	86.7	105.1	55.5	38.2	82.3	80.1
	Combined	33.6	23.7	50.8	29.2	33.6	40.0	24.4	17.6	33.1	31.5
1929 to 1933	Stock	−43.8	−46.5	−36.4	−44.4	−26.7	−34.5	−33.7	−50.5	−33.0	−37.9
	Mutual	−52.4	−48.4	−27.7	−34.1	−35.7	−45.9	−36.5	−48.4	−40.2	−39.1
	Combined	−46.0	−47.0	−35.2	−44.2	−28.6	−36.8	−32.0	−50.9	−34.3	−38.2
1933 to 1937	Stock	68.6	66.2	45.0	61.2	15.5	26.8	12.5	198.9	33.4	44.0
	Mutual	196.4	196.4	109.6	130.6	85.3	152.2	105.7	447.2	130.3	130.3
	Combined	97.0	70.4	59.6	67.5	30.8	43.4	33.2	234.9	50.5	56.6
1937 to 1940	Stock	− 4.9	− 6.3	13.1	− 2.1	6.3	7.4	12.4	− 7.4	5.0	1.9
	Mutual	17.3	8.3	69.9	50.8	24.6	23.5	40.8	17.3	25.5	30.6
	Combined	2.5	− 6.0	29.7	3.3	10.3	12.0	20.3	− 0.5	10.3	7.6

*Minus sign (−) designates decrease.

EMPLOYMENT AND UNEMPLOYMENT

BY

W. R. WILLIAMSON*

I. INTRODUCTION

The Casualty Actuarial Society was organized to deal with casualty and social insurances. Among social insurances it has been chiefly concerned with workmen's compensation. Casualty actuaries are therefore familiar with employment interruptions due to injuries or sickness arising out of or in the course of employment.

During the last ten years employment or its absence have become matters of crucial interest, the emphasis till recently having been on the extent of unemployment, the emphasis now on the shortage of certain types of trained or skilled workmen.

Four special types of governmental agencies have developed a knowledge of employment opportunities, of the extent of compensable unemployment, of the available sources of specially skilled labor, have acquired considerable familiarity with periods of employment, the place of the family in work relationships, and the changed situation in respect to the employment of women. They have developed both information and an understanding that much more information is desirable.

These agencies are:

(1) The Employment Security organizations, both State and Federal, concerned with job placements and with unemployment compensation;

(2) The Federal Old-Age and Survivors Insurance agency, in behalf of which contributions are made from covered employed workmen and which certifies the checks enabling benefits to be disbursed when special situations arise because of employment termination;

(3) Federally subsidized State administered agencies of public assistance, so definitely needed because of certain types of unemployment;

(4) The agencies developed because of defense, including the Selective Service organization, the Office of Production Management, the enlarged Employment Service Agency, etc.

* The opinions as expressed in this article are those of the author and do not represent the views of the Social Security Board.

This paper is concerned with a discussion of terms, observations as to the need of more specific definitions, and certain graphic delineation of employment relationships. The insufficiency of current data is noted and the current field of cost determination is briefly sketched.

Members of this Society should be increasingly interested in all phases of Social Security. This paper attempts a preliminary orientation as to employment and unemployment, two factors basic to all the social services.

II. Work

Modern social insurance is oriented to employment. Social insurance might be geared to citizenship or residence, yet a large majority of the income received by citizens or residents comes from wages, salaries, commissions, and other forms of compensation paid by an employer to his employees because of their productive efforts.

The continued development of modern technology has transferred many activities from the home to the factory or to some commercial service center. The home once *was* largely responsible for making clothing, preparing food, building furniture. *Now*, the major part of the making of clothes is done in factories, food products are prepared in canneries, bakeries, meat packing establishments, etc. Mechanical contrivances have entered the home to short-cut the time required for many of the residual home operations.

The recognition of this change is so universal that it has seemed natural to talk about "the industrial revolution" as though it had already reached its ultimate conclusion and as though all activities were now part of our integrated assembly lines. It is argued by some that the machine has reduced work opportunities. Others maintain that new machines increase the aggregate productive efforts of mankind and thus raise the living standards. There may be a temporary period when the new machine results in laying off a certain part of the man power formerly required for the now obviously wasteful methods of production, but the ultimate result of shortened productive processes has usually been

and may again be a higher standard of living and more diversified employment.

Since the very basis of our social and economic existence is in constant flux, the meaning of all our terms and the factors affecting living conditions are undergoing change. Employment and unemployment are not sharply defined conditions but somewhat conventionalized terms. Unemployment may even be primarily a subjective state.

From the early decades of the nineteenth century to the early decades of the twentieth century there seems to have been a steady lengthening of the period of childhood, a steady rise in living standards, a steady increase in the number of women working in the factory, office, or store, a steady reduction in the number of hours worked per day or week by the average employee who considers himself "employed full time", and a steady increase in the use of such supplements to wages as employer contributions to life insurance, accident and sickness insurance, retirement incomes, and vacations with pay. The dollar value of these supplemental forms of compensation has commonly been separated from the basic pay roll. Explanations of the nature of these supplements to wages have varied widely. As to employer contributions to benefits offered the employee by virtue of his employment it seems sound to call them part of the wage bill.

Wages are so much higher in the United States of America than anywhere else that it seems probable that even excluding these supplementary items American priority in wage levels is still present. Working arrangements have on the whole seemed more permanent than in other countries even though new work relationships to keep up the technical advance are a natural consequence of improved processes. Certain social insurances in some of the European countries seem to have developed rather directly from those provisions in the Treaty of Versailles, especially designed to improve the position of labor and to give it a larger share in the national production. The contribution of the employee within these programs helps to justify the employer subsidy. Some social insurance seems a framework for more consistent financial provision by the citizens themselves toward certain desirable goals. Through it they provide financially against the hazards of unemployment, old-age, disability, or death. Old-

age insurance can deal with work loss at an age so advanced that physical capacity to work has become lowered and future work opportunity seems doubtful. Insurance in behalf of orphaned children and their widowed mothers provides certain compensation for the death of the working father without the necessity of proving that death arose out of or in the course of employment. Temporary and long-range disability insurances attempt to replace some of the wages lost because of sickness and accident. They may also involve benefits in kind in the provision of medical care. Unemployment insurance may grant benefits for certain periods when the employees are well enough to work but jobs are unavailable. Work has come to seem the essential basis, not only of a primitive but of a civilized existence. The pay for work enables employees to buy the products of industry. The absence of work shuts off the income with which to make these purchases.

III. The Social Analysts

Such organizations as the Bureau of Labor Statistics within the Department of Labor, the statistical units within the Department of Agriculture, the National Bureau of Economic Research, the National Industrial Conference Board, the Industrial Relations Counselors, the Social Science Research Council, the Federal Security Agency, and various other foundations and organizations have attempted to determine conventions and terminology in such a way that discussion of work and wages and living standards could be carried on with adequate meaning to all engaged in the discussion. The terminology is not yet exact. In discussing a national situation as to work there are serious limitations, a catalog of which would be rather lengthy.

The columnist is a new expert. Whether or not he taps the proper sources of information, the trenchant explanation of a statistical-minded writer adds to the chance for subsequent sound analysis. His quotations are certain to be challenged, and the ensuing discussion adds to knowledge. The columnists have approached the extent of unemployment with brevity. They have suggested that many family and work relationships have had effect upon the figures. It is now more popularly understood that when the main breadwinner loses his job other members of the

family may be forced into the labor market to make up for the loss. Such members do not necessarily promptly return to their housekeeping or their further education when the family head gets his job back.

The Bureau of the Census in previous decennial censuses has made certain inquiries as to the extent of "gainful employment". They have also carried forward special unemployment censuses. In 1940 the old concept of gainful employment which not only involved having work but also looking for work had been replaced by a much more definite series of questions. The schedules applicable to all individuals 14 years of age and over made specific inquiries as to the week from March 24 to March 30. They asked whether the person were during this period at work "for pay or profit in private or non-emergency government work", whether he was engaged in public emergency work, such as WPA or CCC, whether he was seeking work, or whether he had a job or business, or whether he was engaged in home housework, in school, was unable to work, or idle for other reasons. He was also asked as to the number of hours worked during the week and if unemployed for how long a time in weeks he had been unemployed. There were special inquiries as to occupation, industry, and class of worker, as to the amount of money wages or salaries received during the year 1939, including commissions, and whether he had received an income of $50 or more from sources other than money wages or salary. For a sample of 5% of those listed on the basic population schedule there were supplementary questions with reference to Social Security benefit account number holding and the making of actual deductions for Federal old-age insurance or Railroad Retirement benefits in the year 1939 and as to whether such deductions were made from all, half or more, or less than half of wages or salaries. A certain amount of the information as derived has been released by the Bureau of the Census, though the results of this extensive inquiry have not yet been published in detail.

IV. The Four New Governmental Agencies

While among the organizations discussed above reference is made to the Federal Security Agency, the four governmental agencies

listed in the introduction require special consideration here. Altogether they deal so definitely with employment or the lack of it, that they affect our thinking; they are so closely related to the extent of employment and unemployment, that they require more detailed discussion.

(1) *Employment Security*

These agencies fulfil two purposes—job placement and the payment of compensation to the jobless. The unemployment compensation programs are apparently in effect on somewhat less than half the apparent job content of the Nation. The programs provide that among those covered there shall be established appropriate reports showing essential personal data on the basis of which to pay unemployment compensation when, in accordance with strict formula men "able to work" seem unable to find employment. The machinery is administered by the States, though with some supervision from the Federal Bureau of Employment Security. It was brought into operation by a Federal tax on covered employment, against which tax 90% credit was given should a suitable State unemployment compensation law be effected. Wage reports as to employment are handled on a quarterly reporting basis, sometimes actually showing weeks of employment. Unemployment is evidenced by a weekly report concerning the absence of employment, the ability of the applicant to work, and his willingness to work, and the proper evidence that attempt has been made to find work through the Employment Service. Many of the State programs have assumed a weekly period of unemployment as the unit of measurement. There is a live file estimated to contain in 1939 records on some 31,000,000 separate individuals who had had wage credits reported within that year. This is subdivided, of course, into the 51 State agencies, which also maintain claims files showing weeks when these same individuals have failed to secure employment or have secured only partial employment.

In the administration of such an unemployment compensation program decisions must be made as to:

(a) Types of employment covered by the scheme;
(b) The amount of earnings or the number of weeks of work to be credited within a year called the base period, as minimum qualification for benefits;
(c) The number of waiting period weeks without employment or unemployment compensation;

(d) The minimum and maximum weekly benefit amounts payable;

(e) The maximum number of compensable weeks or the maximum amount of benefits paid within a benefit year;

(f) The extent of evidence given by the employee that no suitable work is available;

(g) Disqualifications for benefits.

In each State these practical considerations have developed definite provisions. Unemployment compensation programs are in operation in every State, two Territories, and the District of Columbia. The strategy of tax offset has been effective.

(2) *Old-Age and Survivors Insurance*

The contributory program of old-age and survivors insurance is geared up to employment to the extent that as a prerequisite to protection the receipt of earned income in covered employment must be shown to be an amount of at least $50 in each of a given number of calendar quarters. No provision ties these wage rates to specific periods of time within the quarter, so that $50 could represent a single day's work or steady work for a month. The coverage is very similar to that for unemployment compensation. The major difference is the exclusion in many States from the unemployment compensation program of the employees of employers who have less than a given number of employees. Among the States this varies from one to eight. There are other minor differences since unemployment compensation is handled by State laws. Detailed comparison between the State records on employment security coverage and the Federal records for old-age and survivors insurance is yet to be accomplished as to the employment of any State. Such comparison would be desirable. As time allows it will presumably be made. The underlying concept of work as a requirement of coverage persists both in employment security and old-age and survivors insurance. Benefits are specifically related to wage payments in both cases. Benefits are also related to work termination in both cases.

(3) *Public Assistance*

Anglo-Saxon nations have for several centuries accepted the responsibility of the whole community to provide at least the minimum standard of subsistence for all its members. Relief has customarily been based upon specific evi-

dence of need. It has sometimes applied rigorous work tests. The proportion of residents receiving unvarnished public relief in the United States has until recently been rather limited, though considerable amounts of "genteel relief" have been accorded by churches, lodges and private citizens. As in the case of unemployment compensation and old-age and survivors insurance, the absence of paid work has been the primary reason why relief has been needed. It has been administered by a growing staff of social workers. It sometimes seems that relief administration has recently become one of our major industries.

The segregation of the categorical assistances has considerably increased the importance of this entire area. The Social Security Act of 1935 specified three categorical assistances:

(a) That to the needy aged;
(b) That to the dependent children;
(c) That to the needy blind.

The categorical assistances seemed to carry less of the sense of disgrace than did outright relief. The recognized number of recipients has greatly increased.

Needy individuals whose unemployment is not due to extreme age, immaturity, or disability have been offered the opportunity of engaging in public works. The provision of such work has sometimes been considered as relief, sometimes as employment.

(4) *Defense*

The end of the year 1940 completed a decade marked by a major depression. It was also marked by the comprehensive adoption of the assistances, various relief measures, and work projects. In 1941 our perspective as to work has changed. Instead of a surplus of labor there is at least in certain skilled occupations an apparent deficiency. Defense has developed the Selective Service for the training of a considerable proportion of our young men. It has greatly increased the responsibility of all industries needed in the defense of the country. "Business as usual," or the upholding of current living standards as a matter of morale may be helpful in maintaining existing work arrangements until the defense assignments are thoroughly under way and shortages of man power become more acute. Then, as production needs advance, priorities will possibly shift considerable groups of workers from existing peace-time activities to defense industries. Established enterprises may be reorganized as a defense measure because we require waste

elimination and increased efficiency. Inexperienced workers with apparent capacities will be promptly trained for limited duties. It is now very easy to contrast the incomplete productive results in France in the period before the war, when their work week was so short, with the current superior results in England, where along with increased morale and alertness the work week is considerably longer. It has sometimes seemed to be assumed in various countries that the fewer hours a man worked, not only the more effective would he be per hour but the more would be his aggregate output. In our own country there now seems so many jobs to be done that the philosophy of made work seems suitably postponed. The idea that real work may occupy the entire community is reasserting itself.

V. Periods of Employment

The factory and its machinery have had a great influence upon the organization of the working day. The simplification of work processes, the formation of the assembly line, the complete use of plant facilities have organized the day into rather definite periods of scheduled hours of work. The very year falls into a scheme where there are mainly work days but periodic holidays and frequently vacation periods. The work day has varied from more than twelve hours down to as short a period as six. A work period of half the 24-hour day is now most unusual save in time of war. The drive for the shortening of the work day is part of the recognition that leisure is a tangible asset, that mechanization should lead to a wise combination of more goods and services and less working time. Industrial engineering has persistently increased the effectiveness of a man-hour of work. The gains are divided between higher living standards and more free time.

As against a 72-hour work week the increased leisure of a 44-hour work week has seemed a notable achievement. The early days of the depression were marked by a different type of work-week-shortening, when part-time schedules as short as 24 hours a week were adopted for entire factories. The philosophy of work sharing implied that the men should be working more hours and would prefer to work more hours but there was insufficient work to go around. Weeks as short as 30 hours have been seriously suggested on the principle of sharing the limited volume of existing work so as to eliminate all unemployment.

A division of the Department of Labor is now named "Wage and Hour". Much of the effort has been directed toward reducing the number of scheduled hours to be worked per week for large groups of workers. Forty hours per week has been established as the maximum permitted by statute for such workers, though a temporary emergency arrangement scheduled 44 hours. Implicit in such a standard work week, however, is the opportunity to extend that work week with higher wage rates paid for extra hours and more compensation for the whole working period.

Drug stores and service organizations like repair shops, telephone companies, transportation systems, develop distinctive working time distribution so as to maintain 24-hour service seven days a week. In general, however, the customary work week is one of 5½ days, with no work from Saturday noon until Monday morning, or five days with no work either Saturday or Sunday. Retail establishments have regular part-time arrangements and extra employees on Saturdays and during bargain sales or holiday seasons. Many have been giving half days off during the middle of the week. The coal mines show employment schedules that vary strikingly from week to week and from month to month. Agriculture is noted for specific seasonality, as is the hotel business of Florida and the White Mountains. While factory production sets conditions which dominate our thinking on employment, many areas of employment differ considerably in their work timing from the factory schedule. Terms which are specific and clean-cut when applied to factory operations become somewhat blurred when applied to the work conditions of agriculture, domestic service, emergency service, or self-employment.

Since social insurance is now being gradually introduced into the American industrial scene and has been geared up to *employment* and the *absence of employment*, this additional factor increases the need for certain conventions and certain standard terms.

VI. The Extent of Employment

Under war conditions in Germany it has been said that 60% of the population is gainfully employed. In the United States we have been accustomed to think that somewhat less than 40% have

been engaged in paid work relationships. In these defense times, however, and from the increased knowledge of the division of jobs among extra individuals, it seems probable that some employment may be had by as much as 45% of the population within a year.

The particular structure of the social insurances has developed extensive records which already show the very large number of individuals who have some covered employment without achieving steady work. Both the old-age and survivors insurance program under Title II and the unemployment compensation programs developed under Titles III and IX of the Social Security Act can be the means of greatly clarifying our knowledge of the extent of employment. We have spoken rather easily of "the labor market" as though the men and women were putting up their man power as a commodity to be sold in that market. It is recognized that certain individuals remain completely aloof from this so-called market. They go to school; they engage in housework; they suffer from some form of disability; they are members of a limited leisure class; or they are simply unemployed.

In our 1940 population of 132,000,000 members it is possible that there are 60,000,000 workers, of whom over a period of a year 30,000,000 may have worked practically full time; 25,000,000, part-time; 5,000,000 have remained almost wholly unemployed during the entire year even though looking for work. The Census Bureau release of April 4, 1941, based upon the 5% sample and dealing with the work conditions of March 24 to 30, 1940, shows 53,000,000 in the labor force, with 45,000,000 employed, 2,000,000 on public emergency work, 5,000,000 seeking work.

Considering the variable work weeks, seasonal employment, and intermittent employment, we begin to sense the wide range represented by:

(a) Those who are available for work but have no work whatever;
(b) Those who are barely connected with work opportunities but do have some paid jobs;
(c) Those who work intermittently, whether according to some general program or spasmodically;
(d) Those who work most of the time; and
(e) Those who are steadily employed.

In respect to all of these categories except those who have no work at all there is time lost because of sickness, accident, factory shut down, or vacations. For the full-time workers such interludes are not regarded as work interruptions, particularly when salaries are continued.

Many of the early State unemployment compensation bills carried references to "full-time employment"—the assumption being that for a particular industry in a particular locality there would be a general understanding as to the number of hours of work needed for a "full work week". In other unemployment compensation legislation the awkwardness of dealing with an assumed number of hours of work was avoided by basing work status on the total amount of earnings in a specified period. *Weeks* when there was total unemployment are defined as "weeks of full-time unemployment representing no income or representing income less than an amount specified in the statute". *Weeks* of partial unemployment are defined as "weeks in which earnings from regular employment were reduced by a definite amount or percentage from recorded earnings of prior periods of time". *Weeks* of part-total unemployment are defined as "weeks in which there was no regular employment but only odd jobs or subsidiary employment". In old-age and survivors insurance the absence of a job beyond age 65 is admitted when during a month aggregate earnings in covered employment amount to less than $15.

VII. The Family and Division of Labor

In a population of 132,000,000 persons a working force variously estimated from 45,000,000 to 60,000,000 individuals leaves the major portion of the population outside of the body of "employed". Not only have the factory system and the use of women in positions carrying wages and salaries gained considerable foothold, but the family has also persisted as a special arrangement of work cooperation and pooled resources. The "family" most commonly includes a man, his wife and their minor children. Families may contain members of only one generation. They may include members of three or even four generations. The Consumer Purchases Study analyzed families according to make-up by number of earning and non-earning individuals. It indicated the

number of adults and children under the age of sixteen. We like to think that the family has usually been self-sufficient and has attempted to meet from the earnings of its members the required expenditures of those members. For many years in France there was a special pooling and redistribution of a portion of the wages in accordance with the size of family. This was done specifically to insure added income for the workman with several children. This method of pooling part of the wages seems at first blush an awkward deviation from paying wages directly related to individual production. It was hoped, however, by this method to avoid specific relief in behalf of large families and to encourage somewhat larger families and revise the trend of the falling birth rate.

If only 40% of the population are gainfully employed the production and the income of this sector should be sufficient to provide subsistence for themselves and for the other 60%. This statement is somewhat over-simplified since within the family there is still a large amount of personal unpaid family production, both in the processing of foods and in other household services. Dr. Dublin, of the Metropolitan, in developing his consideration of the economic value of a man seemed at one time to value the housewife's contribution to the family economy as worth approximately one-half the wage earned by the employed husband. The recently developed phrase "unpaid family labor" recognizes the status of those members of the family who outside of the home give their work without special compensation as unpaid family labor. This same work within the home is recognized as homemaking or housekeeping. In most wage analyses it is assumed that each family will have one or the other of these two types of unpaid family work but that its money value need not enter into the arithmetic of family budgeting. It is probably a most important element, and it makes more difficult the many efforts to determine over-all per capita incomes State by State. Moreover, the efficiency of the wife working at home may determine whether the family as a whole maintains a solvent condition. It is conceivable that the emphasis upon having recorded earned wages in order to secure protection from the social insurances may tend to create more wage relationships in lieu of so much of these unpaid family labors of recent years.

VIII. The Changed Position of Women in Employment

Electrical equipment in the household, and the available services of the laundry, the bakery, etc. outside the home have so much shortened the essential working day of the housewife that it is quite possible for her to engage in part-time paid employment with no obvious loss in household efficiency, or on the other hand, to build up special time-consuming interests in order to utilize the time saved by modern equipment. It may be possible for the efficient woman to maintain "full-time paid employment"—especially if the "full-time" happens to be on the low side in hours per week—as well as to carry forward the reduced family work. A few years ago a large factory shifted from an eight-hour to a six-hour day and ran four six-hour shifts. For the new six-hour day they paid what had represented seven hours of pay and suggested the feasibility that both husband and wife should take one shift each. This would largely increase the family income, though it might necessitate distributing somewhat the housework between the husband and the wife. This experience has been running for several years now. It is hardly typical of factory employment in general. It is indicative, however, of the possible changes in the make-up of the working community, where many of the women do work on shifts of this sort after marriage. It is also illustrative of the untapped working capacity of women not now being fully utilized.

IX. Graphic Displays of Data

A. *Work Capacity*

The various experts have suggested that the gainful workers can be simply classified. One such classification would be an array ranging from the virtually unemployable at one end to the best workers at the other end. The near-unemployables may become recognized as completely unemployables. They will then have no further work opportunities and will disappear from the array. Most of them continue to have some chances at work and so long as they do they are part of the labor force. The near-perfect worker may still lose some time through vacation, or ex-

cusable illness, or for a week or two of lay-off for inventory. There are relatively few who work throughout the entire year. There are many with but insignificant portions of employment. Besides the unemployed who have been eliminated from the category of employment by a recognition of their unemployability, there are others considerably affected by disability, mental incompetence, absence of work habits, and a work wariness rather dismaying to the employer. If we examined the 3,000,000 least able to work and offered them permanent employment, we might secure from them a million complete work years. While the group of the unemployed has been discussed as numbering ten millions, recent figures show five millions. It seems probable that there may be less than three million really competent workmen now left unemployed.

B. *Graphs*

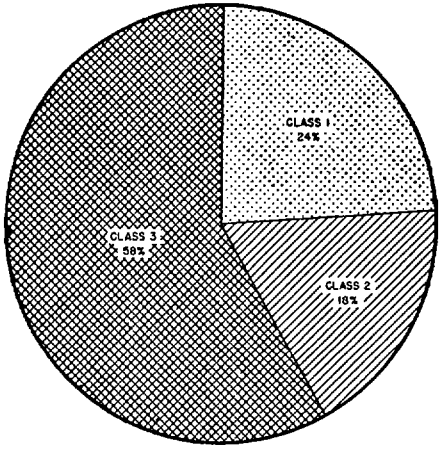
Following out certain rather arbitrary decisions, a graphic presentation of the subject of employment is included herewith. In general, specific figures are omitted. The approach developed arises from some familiarity with the four government agencies discussed in Section IV. The major reason for the current analysis may be the current defense emergency and the need that there shall be a maximum use of available man power. It seems increasingly desirable to know more about the reserves of labor and to apply actuarial analysis.

C. *The Breakdown of the Population Into Three Major Categories—Chart* I

Chart I subdivides the entire population of the United States into three portions. The first portion includes those who *within a given year* have had some taxable income from employment covered under the unemployment insurance programs. The second includes those individuals who, while having no employment covered by that program, have had during that same year employment covered by old-age and survivors insurance (in the main with small employers) or employment wholly excluded from both unemployment compensation and old-age and survivors insurance.

CHART I

ESTIMATED PERCENTAGE DISTRIBUTION OF 1940 U. S. CENSUS POPULATION ACCORDING TO CLASS*



* Class 1—Persons with some paid work covered for UC during a calendar year.
Class 2—Persons with some paid work, but none covered for UC during a calendar year.
Class 3—Persons with no paid work during a calendar year.

A large proportion of the membership of the second subdivision is made up of the self-employed and the workers in public employment, agriculture, domestic service, and the non-profit enterprises. The third portion represents those in employments not covered by a wage relationship but considered as engaging in unpaid family employment and those lacking employment altogether because of immaturity, senility, sickness, or the possession of a leisure class income. These three component elements of Chart I are further analyzed in Charts II, III, and IV.

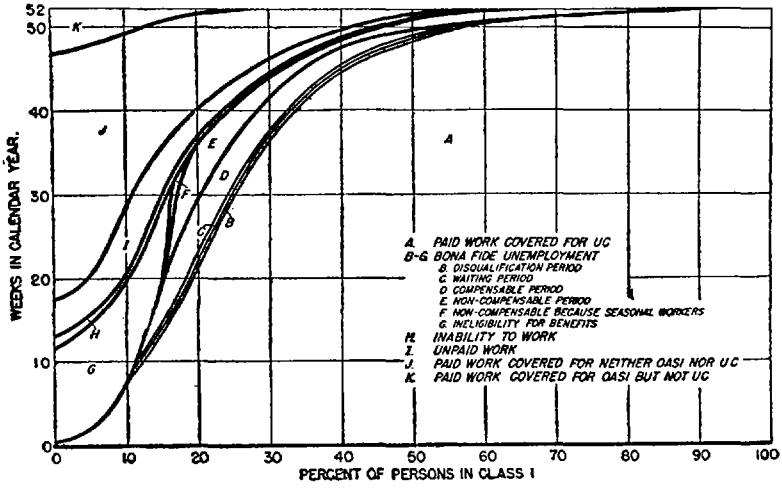
D. *The Unemployment Insurance Coverage—Chart* II

Chart II shows for the unemployment insurance coverage workers arranged in an ascending scale from left to right, from those who have a very little work covered for unemployment insurance within the year to those who have full-time work covered for unemployment insurance within the year. The lower right hand

portion of the chart represents the exact duration of the covered employment of the persons in the class, while all areas above represent average durations of employment for the same people. The rectangle, in short, represents a year of potential work for each person, and the various areas show how those years are divided. The upper left hand portion of the chart (J and K) represents employment in non-covered (in respect to unemployment insurance) industries of those individuals having some employment in covered industries. The intermediate area which is further subdivided represents the portion of the time not accounted for by covered or non-covered employment. There is, of course, considerable doubt as to the extent of the work or the idleness in the upper left hand portion of the chart. There is great

CHART II

ESTIMATED DISTRIBUTION OF MAN-YEARS REPRESENTED BY CLASS 1, ACCORDING TO WORK STATUS, AND OF MAN-YEARS OF BONA FIDE UNEMPLOYMENT ACCORDING TO BENEFIT STATUS



variation as between calendar years in the extent of bona fide unemployment. The chart is designed to indicate a national condition, while the State is the unemployment insurance unit. There is indicated unemployment in the uncompensated waiting period (C) following the cessation of covered employment, unemploy-

ment after the expiration of the maximum benefit period to which the ex-employee is eligible (E), unemployment disqualified from benefits because of voluntary termination of employment, discharge for cause, seasonal work limitations, work terminations because of disability, labor troubles, etc. (B, F, and H), and finally unemployment disqualified for benefits because the employment record in the base year had been insufficient to give eligibility (G).

This display has been arranged as a percentage distribution of the "covered workers". They numbered in the year 1939 for the country as a whole possibly 31,000,000 separate persons. (This seems to be the sum total of those with some wage records in all the State agencies carrying this program, though records have not been uniformly maintained in all jurisdictions.) There is an operating lag in determining exact data. There may have been approximately 23,000,000 man years of work in covered employment represented by these 31,000,000 individuals, so that 8,000,000 man years of uncovered work or unemployment remains to be accounted for. The smooth curve which separates the period of covered employment from the rest of the time is drawn somewhat free-hand but is the result of a limited inspection of the employment data. It appears from this chart that a large proportion of the employees had too much employment to be eligible to benefits. It is also evident that a tangible proportion of the employees had too little employment to qualify for benefits. The area of protection, one might say, is indicated by the charts to cover half of the employees. Among this half much of the time not spent in employment is non-compensable for one of the reasons there shown.

This chart may be called "schematic". It suggests rather a method of approach than an indication of results. In the array the number in each percentile may be approximately 300,000 persons. The curve which borders the area of covered employment shows at each point not average covered employment but the estimated absolute number of weeks of covered employment for each man in that group. In the upper part of the picture this is not the case. Those individuals included in the tenth percentile each have seven weeks of their working year in covered employment. They *average* about twelve weeks of non-compensated unemployed time (ineligible to benefits), about one week of sick time,

about nine weeks of unpaid home work, about three weeks of work in employments covered by the old-age and survivors program but not by unemployment compensation, and about twenty weeks of other non-covered employment. For the men who have 45 weeks of covered employment the other seven weeks seem to be divided into *averages* of one week of waiting period, a fraction of a week of unemployment disqualified for benefits, two weeks of uncovered employment, one and a half weeks of unpaid home work, and most of the rest in compensable unemployment. The reasons why such unemployment then is not compensated are carefully listed in the chart. These proportions are plausible—they are more prophecy than history.

There is a large area of the population embraced within the nominal coverage of unemployment compensation. A much larger proportion of the people is affected by the Employment Service. The boundary lines create anomalies. It is difficult to justify the disqualification of all the unemployment in (G) which is not compensated because an inadequate number of weeks of covered employment have been registered. It is the practical result of any insurance plan which is not universal that it draws arbitrary boundary lines between the beneficiaries and the non-beneficiaries.

It is not the purpose of this study, however, to consider particularly the social values of the program nor the awkwardness of denying protection, but rather to indicate the necessity for further quantitative valuation of a new social service and the actuarial work required to determine the true size of the areas sketched in the charts. Chart II theoretically represents only one year of protection and in doing so it *assumes a telescoping of the base period and the benefit year* in a way which somewhat belies the nature of the qualifying base period of the subsequent benefit year. It is probably closer to the conditions of 1939 than to those of 1932 or 1933. In these earlier years work was much more effectively shared between those who otherwise would have had either full-time employment or none at all. It is probably closer to 1939 conditions than to those of 1942, when it is to be expected that a great many more people will work in covered employment and when a much smaller proportion of those people need show such long periods out of work.

In spite of the limitations of Chart II it suggests a certain num-

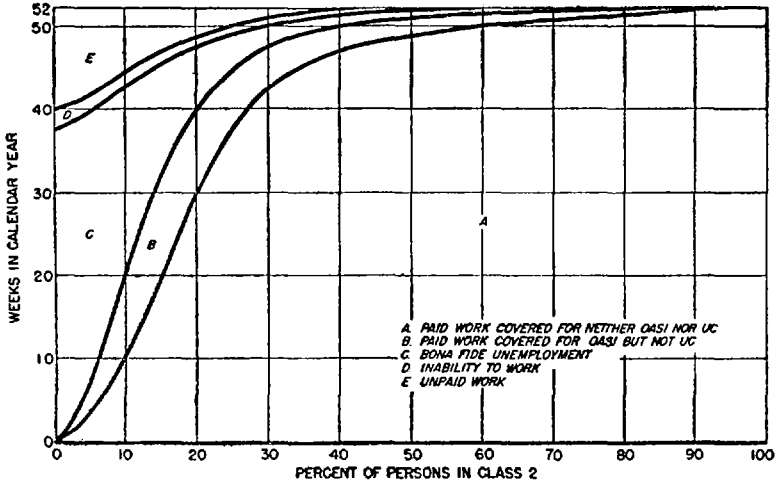
ber of safeguards in the very structure of the plans for granting benefits under unemployment compensation. By these safeguarding limitations the compensable area is held within reasonable bounds in comparison with the area of covered employment. While the chart can be said to show three separate types—the fully employed individuals, the slightly employed individuals, and the individuals with enough employment to secure benefits—we do not in reviewing individual workmen know promptly to which category a given man belongs. There are 51 separate jurisdictions and 51 formulas. The chart is but a single year's composite picture, theoretically in retrospect. There will be a greater in-and-out movement between the different portions of the chart as time goes on. While unemployment compensation at the present time builds a new base period in each successive period of time with no benefits carried over from the past years, the defense emergency may well change this and complicate benefit payments by relating benefits to the employment records of several years.

E. *Those Employed But Not in Employment Covered by Unemployment Insurance—Chart* III

Chart III, dealing only with those individuals lacking work covered by unemployment insurance, is limited to those who have some work during the year but in occupations covered by old-age and survivors insurance though not unemployment compensation or in occupations excluded from both insurances. Because of the absence of Social Security records for many of these employments, Chart III is even more artificial than Chart II. The two charts include all individuals with any paid work whatever during a single hypothetical calendar year. There are excluded, then, from these two charts that group of individuals called "the unemployed" who have had no employment whatever throughout the year. Even so, we are assuming that with persons represented on the two charts and the unemployed we have classified as gainful workers with some work during the year some 56,000,000 separate individuals. The wage records developed by both insurances show tremendous numbers of workmen who have had some degree of work within the year. The practical listing of persons with only a fraction of a day's paid work within the year may in time show that instead of 56,000,000 separate persons there are considerably more than 60,000,000 such persons in a year as good as 1939.

CHART III

ESTIMATED DISTRIBUTION OF MAN-YEARS REPRESENTED BY CLASS 2, ACCORDING TO WORK STATUS



The additional 4,000,000 above the 52,000,000 listed in the 1940 census have probably rarely been included in any total statement of the labor force. They have occupied the shadowland between complete absence of paid work and any satisfactory work relationship. In old-age and survivors insurance there are millions of persons who have had less than $100 of earnings credited within a calendar year and millions who have had wages credited in one calendar year but none whatever in the next. These two categories are largely made up of school or college students and housewives who are attracted to certain part-time jobs in one year and not in the next.

The two charts taken together evidence the sort of information which ought to be accumulating in the administration of the two insurances. With the extension of these insurances to those occupations now excluded, the recorded data will be greatly extended. Such information for a single year has most limited significance. Were these charts a factual representation instead of merely a framework indicative thereof, it would even then be desirable to point out the low credibility properly accorded such limited ex-

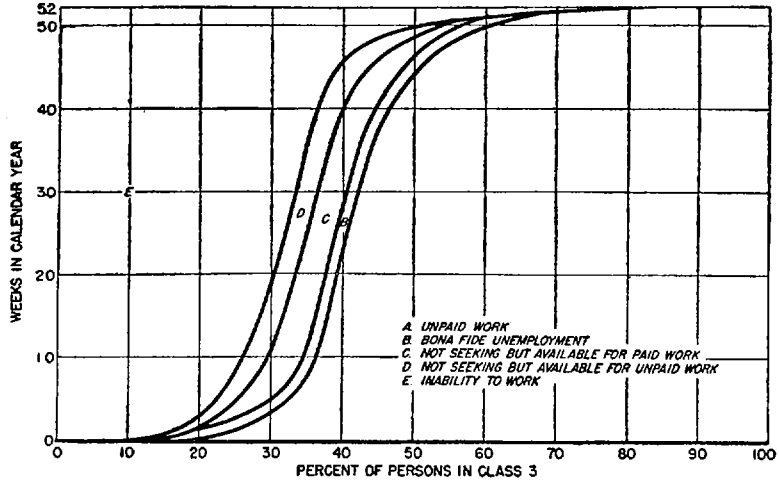
perience. The charts suggest certain types of study yet to be developed and necessary in any actuarial appraisal of employment.

F. *Those Without Paid Work—Chart* IV

Chart IV classifies those who currently lack all wage relationship during the current calendar year into five categories according to the duration of their unpaid work. We have also indicated the average duration of bona fide unemployment, where work is being sought, periods when work is not being actively sought but the persons are able to work, and periods of inability to work. It is assumed that this inability is of various types, including disability, confinement in institutions, and mere unemployability.

CHART IV

ESTIMATED DISTRIBUTION OF MAN-YEARS REPRESENTED BY CLASS 3, ACCORDING TO WORK STATUS



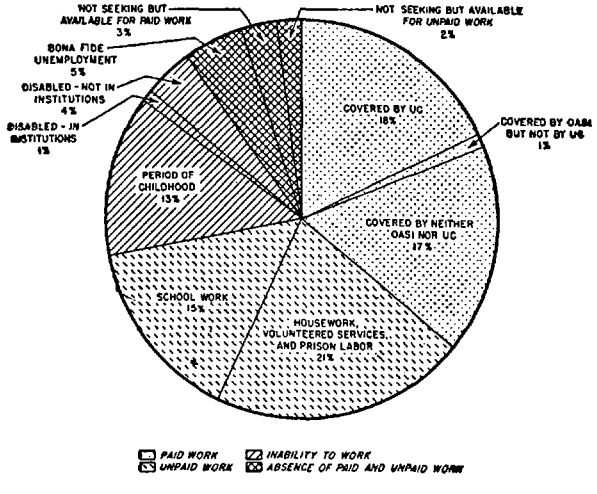
G. *Percentage Distribution of 1940 Census Population by Man Years—Chart* V

Chart V, as did Chart I, deals with the entire population. This chart, however, distributes the man years according to activity or potential activity, although possibly in a somewhat arbitrary fashion. With the growing importance of the defense program

some portion of the man years represented by the group of unpaid workers should be recaptured. What is graphically termed "work rustiness" should be polished up. Children will develop into workers in time. As has been earlier suggested in this paper, the housewives offer a large potential paid work capacity. Among the "leisure class" there are numbers who, believing themselves needed as workmen, will terminate their leisure attitude and go to work. There is already evidence that many with special skills long unused are finding employment and others are using their special skills for a longer work week. Much added work capacity lies in such reduction of unused time.

CHART V

ESTIMATED PERCENTAGE DISTRIBUTION OF MAN-YEARS REPRESENTED BY 1940 U. S. CENSUS POPULATION, ACCORDING TO WORK STATUS



H. *The Number of Persons with Various Periods of Unemployment Within a Year—Chart* VI

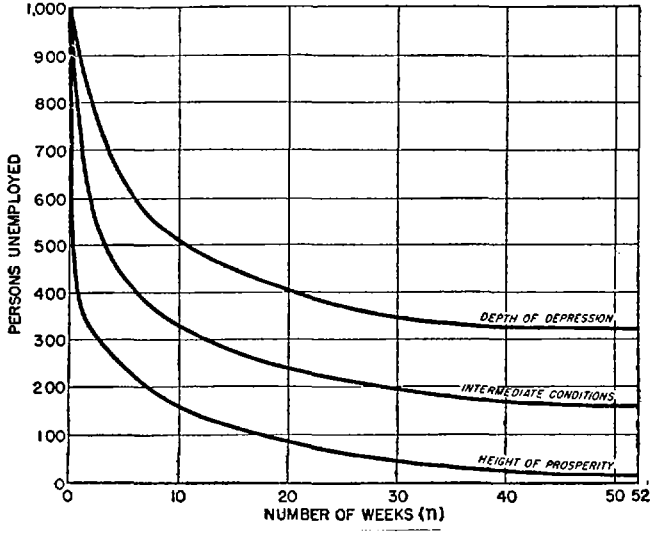
Chart VI indicates the curves of the unemployed arranged somewhat like the l_x function of life tables. The radix is 1000. The curves are sketched in very freely but show from certain plausible approaches what happens to 1,000 individuals becoming unemployed as time passes. The downward slope of the curve indi-

cates returns to employment or the elimination from unemployment by disability or death. The curves indicate the cumulative effect of several spells of unemployment taken together over a year's time, and it could be prepared only at the end of a full year of observation. Such curves should become available from the tabulated experience of the various State agencies—after time has allowed mature review. The three curves represent what might be the situations under widely varying economic conditions.

CHART VI

ILLUSTRATIVE CURVES: NUMBER OF PERSONS WITH AT LEAST *"n"* WEEKS OF EMPLOYMENT WITHIN A YEAR

Radix = 1,000 persons with some unemployment



I. *Limitations of the Data*

These displays have been made after considerable discussion and a certain amount of familiarity with the subject. Much work yet remains to be done to make such exhibits adequate portrayals of actual conditions. In the early years of social insurance programs the belief that actual administration is more important than actuarial analysis may itself postpone somewhat the establish-

ment of comprehensive frameworks for cost study. Most of what may be called the actuarial valuation remains to be done in all fields of social insurance. It is over six years since the Committee on Economic Security initiated study in this country of certain phases of such protection and over five years since administration of the Social Security Act got under way. In the early years each problem is new, each decision sets a precedent. Most decisions, moreover, must be made before the administrators are really ready to make them. Actuarial review will be coordinate with future administration. The programs are very largely State administered and involve coordination at local, State and Federal levels.

X. The Immaturity of Current Experience

The charts seem to represent cross-sections of observation. A social insurance plan is outlined to-day in order to secure organization and administration for several decades into the future. This is thoroughly understood in life insurance, where there is so great a contrast between a one-year term policy and an ordinary life policy. In any insurance program there is a considerable difference between the long-range importance and the temporary expediencies of a given year. While to-day in most unemployment compensation programs the base period determines the benefits for the benefit year and annually a new base period and a new benefit year come into view, continuity may seem more and more important when the current self-sufficiency of a single year becomes open to question. Social policy may well require more recognition of continuity even as in pension fund discussion growing attention is given to "vested rights".

This continuity has been considered somewhat in connection with old-age and survivors insurance, though there are numerous anomalies from the standpoint of long-range social policy which must be considered as experience gradually develops. The benefits in unemployment compensation will continually vary. Eventually, the non-typical results of such years as 1938, 1939, and 1940 will fit neatly into a long-range perspective which is now rather difficult to forecast.

In connection with the defense program it is already being sug-

gested that unemployment compensation benefit rights of men entering military service should be "frozen" so that when they return to private employment they can pick up these rights where they left them rather than find them completely eliminated by the very structure of the plan. This recommendation will probably be extended to considering the defense activities of a civilian character as well, both for Federal office work and for special agricultural duties.

In the early development of the unemployment compensation plans this factor of continuity was recognized in some State programs by granting a longer duration of benefits for those who had worked for several years without drawing benefits. One definite advantage would follow from varying benefits in accordance with work history over many years. There would then develop a considerable volume of case histories most helpful to long-range cost analysis.

Without emphasizing the range of individual protection which would result from the carrying over of benefits from one year to the next, it is essential to view the whole unemployment compensation program as involving experience throughout a *long* business cycle at least. The accumulation of reserves during relatively good times or times of low compensable unemployment so that in times of high compensable unemployment there shall be adequate funds for the payment of benefits requires careful study as to the variations in employment stability, and in the seriousness of unemployment. For the full delineation of employment and unemployment history a three-dimensional graph was constructed by Mr. Harry Winslow for the Committee on Economic Security in conjunction with the studies made by that Committee in 1935. The changing structure of unemployment was represented by a surface, the surface itself developed from a frequency distribution curve of the unemployed by duration of unemployment.

Over a decade or more of time it is possible to indicate variations in the extent of school attendance, variations in work continuity among the apprentice group, variations in work persistency among the elderly individuals, and even the differentiation between the hard core of unemployment, the hard core of employment, and the intermediate group of individuals who shift from employment to unemployment and back again.

XI. The Unused Man Power and the Current Defense Emergency

For the defense program and for the continuation of production of goods and of services which belong to the ways of peace there are differences of opinion as to the inherent productive capacities of the relatively well constructed American production machine. There are those who believe that because of the large reserve labor force virtually no reduction in living standards will be required when we allocate a growing proportion of our labor time to the duties directly appertaining to defense. These individuals believe that in the steady reduction of hours worked during the past two or three decades we have nevertheless maintained on the part of most of the members of the community certain work habits which can now be developed so as to utilize a major portion of the day or the week for work. They contend that the population as a whole would prefer to reduce its leisure time considerably in order to continue earning enough for the purchase of customary goods and services. They contend that the added responsibilities developed by defense can be largely cared for by the increased working time.

There are many others who feel that the appraisal of work reserve has been counting upon the existence of more usable idle time than has actually been the case in the recent past. They believe that too large a share of the apparent labor reserve represents virtually unemployable individuals or individuals with marked work handicaps so that the use of the residual competent but unemployed workers and even the spare time of those who are not working to full capacity will together be insufficient to meet the added requirements of the defense emergency. They believe that if we are to meet defense needs promptly and efficiently priorities must be established and that beyond drawing upon the time of the married women, of the elderly individuals, and of other time not sufficiently utilized that it would still be necessary to transfer a considerable amount of man power from occupations not directly connected with defense.

As we learn the facts we can enter them upon our charts in constructive fashion so as to replace the theoretic areas by areas representing actual history.

XII. The Current Field of Cost Determination

We have now reviewed briefly a considerable diversity of presumptive data concerned with the employment and unemployment existing throughout the Nation. The unemployment compensation agencies in the administration of their programs must accumulate data showing as well as possible certain quantitative information. It would be well for them to develop data as to the number of individuals covered, comparable to this record in old-age and survivors insurance. It is essential that they show the amount of time worked for each employee, at least as to weekly work units. It is essential that they show the income which determines tax receipts, the extent of unemployment with sufficient data to determine the facts of benefit receipt. The program of old-age and survivors insurance punctiliously shows for most of these same individuals specific amounts of earnings in employment covered by old-age and survivors insurance, a field somewhat wider than that of unemployment compensation. An attempt to develop from the two sets of records information as to time limits of employment and unemployment, of the amount of wages received during employment, the amount of compensation granted during unemployment will require considerable accumulation of data so as to show both national trends and State variations from those trends. Most interesting suggestions have recently been made by the Social Security Board as to relating the financing of State programs more closely to the whole national program of unemployment benefits. In the administration of both plans special studies covering the aged, the working staffs at the high ages and at normal ages, and the children who will be full-time workers later on may develop. Habits as to school attendance, habits as to work within the home or as to unpaid family labor without the home, the breakdown of the year into working and vacation time, work programs for use by those at the higher ages, all of these studies and more are required for an understanding of the costs and the methods of functioning of both old-age and survivors insurance and of unemployment insurance.

Important also in these studies will be fuller reports of the activities of those above age 65 who are drawing old-age assistance from State agencies since the grants are largely subsidized by the

Federal Government. The balanced financial situation of the future will depend upon a combination of two interrelated functions:

(1) The body of employed individuals on wage or salary or in constructive family employments;
(2) The body of unemployed individuals who serve as a virtual dead weight against that part of the community competently at work and who make up the group of claimants.

The total benefits of the second class must represent amounts not out of line with the national economy.

Having developed charts as to the utilized and non-utilized work capacity of the community since we need this data now for defense, we should later be in a preferred position to carry forward the same type of analysis in relation to the occupations of peace. Sober discussions are appearing both in Great Britain and in the United States concerning the transition from the emergency to peace-time activities.

If we are to remedy the shortage of modern housing, if we are to substitute good roads for the many bad ones, if we are to complete the needed flood control facilities, if we are to bar from all the good roads those cars so obsolete as to be a menace to safety, if we are to modernize those branches of our industry where modernization is already overdue, we will need to maintain a thorough-going controlled record system as to the occupations which can be handled by transfer from the then less important defense industries. We will, in short, need a thoroughly modern, efficient employment service which is being seriously trained to-day and which can use that training for to-morrow's transition.

CONCERNING THE RELATION BETWEEN THE COST OF TRAFFIC ACCIDENTS IN A PARTICULAR COMMUNITY AND THE CONDITIONS THEREIN

BY

ALBERT W. WHITNEY

Every event is part of a sequence; it is preceded by causes and followed by consequences. Accidents are no exception: they have causes, they are no longer thought of as just "happenings," and they certainly have consequences. It is their consequences, measured in cost, with which casualty companies are primarily concerned. The usual method of rating is based upon cost, that is upon "experience." Because cause and effect are, however, bound together so closely, it should be possible to make rates in terms of causes as well as in terms of consequences. This is just what has been done in workmen's compensation insurance through schedule-rating and in the field of fire insurance the rates are even more largely based upon an analysis of causes, that is upon the conditions that exist in the particular building and in the particular community. Whether schedule-rating is possible in the field of automobile insurance is wholly a practical question. It will be worthwhile, however, in any case, to see what the problem looks like and an analysis of the hazard may be valuable in various other ways, such as in the grading of cities, even if it may not be feasible when applied to rating.

Rating in terms of consequences, that is in terms of experience, is the more direct and to that extent the more trustworthy method. This, however, is its only advantage. Rating in terms of causes, while more difficult and undoubtedly considerably less accurate, has all the other points in its favor.

First, it is a more effective measure of the hazard. The great disadvantage of rating in terms of experience comes from the fact that time is required for the experience to develop and mature and become incorporated in the rates; as a consequence there is a lag of approximately three years between the time when the accidents happen and the time when the rates that are based upon these accidents come into actual use. On account of this lag the rates will never be exactly right unless conditions are stationary. If conditions are growing worse the rates will be too low

and the companies will lose money. If conditions are improving the rates will be too high.

It is important to have a rating system that can meet changes in conditions immediately. Suppose a change of administration in a city has resulted in a twenty-five per cent reduction in the number of traffic police or in any one or more of a dozen other things that would produce adverse traffic accident conditions. Under the present method of rating by experience nothing could be done to modify the rates so as to meet this condition short of about three years. Under a schedule-rating plan, however, an adjustment of the rate could be put into effect immediately. Since rates are affected by conditions, rates, if they are to be responsive to conditions, should be made in terms of conditions.

Second, it has greater preventive effect. Insurance companies are interested in prevention, not merely because the loss-ratio must be kept from going up if the companies are to make money, but also because low-rated business is preferable from every point of view. While rates made on the basis of experience have some preventive effect the lag between a change of conditions and the corresponding change in the rates is so great and the relation between the rate and the cause is so indirect and obscure that the connection is lost sight of and largely disregarded by the insured, and the argument that preventive activities will eventually show in the rates has little effect in producing results. On the other hand, through schedule-rating the effect on the rates of the setting up or abandonment of such activities can be made immediate and peremptory. Schedule-rating is generally acknowledged to have been the most powerful influence in the early development of the industrial safety movement and it has certainly played an enormously important role in the control of the fire hazard.

The third advantage of rating in terms of causes is due to the fact that it is a better basis for understanding and cooperation on the part of the public. People feel instinctively that insurance companies should concern themselves with prevention and the more closely such work is tied in with the business of the individual company the more effective it will be in securing the good will and cooperation of the public. Schedule-rating, furthermore, brings the selling end of the business actively into the field of prevention.

The disadvantages of schedule-rating are as follows:

First, even under the best conditions it is a far less accurate measure of the cost than rating in terms of experience.

Second, it is far more expensive. The services of an engineering corps are needed in order to determine the conditions upon which the rates are to be based. There can be no saving by abandoning the present collection of cost data for these must still be had for checking purposes. Preventive activities have, however, in general, more than paid for themselves and this would undoubtedly be the case here.

Third, the difficulty of setting up and administering a satisfactory system of schedule-rating for automobile insurance would undoubtedly be very great; there would probably be considerably greater difficulties than in the case of either workmen's compensation insurance or fire insurance, where the conditions are in general more tangible and hence more susceptible of analysis. Whether these difficulties are prohibitive is a practical question that can be answered only by a thorough study of the situation. The first step in such a study must be an actuarial analysis of the problem.

The Actuarial Problem: To develop a formula for the pure premium for a given territory in terms of conditions in that territory.

Let $\pi =$ the pure premium.

$N =$ number of car-years.

$n =$ number of accidents during N car-years.

$m =$ number of units of car-use per car-year.

$\Delta t =$ length of unit of car-use, where Δt is sufficiently small so that not more than one accident is physically possible during that time. Just as the tossing of a die represents the unit of exposure in regard to the possible throwing of a six-spot, so the unit of car-use represents the unit of exposure in regard to having an accident.

$T = m \Delta t$ or length of time car is in use per car-year.

$\Delta p =$ probability of accident during a unit of car-use.

$q = 1 - \Delta p$.

$P =$ limiting value of $\frac{\Delta p}{\Delta t}$ as Δt approaches O.

$K =$ cost of accidents during N car-years.

$C =$ average cost per accident.
$s_j =$ proportion of accidents of severity j.
$c_j =$ average cost of an accident of severity j.
$S =$ average severity of all accidents.

$V =$ index of claim cost $= \frac{C}{S}$.

$\pi = \frac{K}{N}$. If the value of π were to be obtained retrospectively then K and N would be gotten directly from the experience. When π is to be obtained prospectively, that is in terms of conditions, then K must be analyzed into elements that can be expressed in terms of the conditions in the territory.

During the mN units of car-use the probabilities of $0, 1, 2, \cdots\cdots (mN-1)$, mN accidents will be given by the corresponding terms in the expansion of $(q + \Delta p)^{mN}$, and n, the expected number of accidents, will be equal to the sum of the expectations got by multiplying each of these terms by the corresponding number of accidents. This, by the application of a well-known theorem, will be seen to equal $mN\Delta p$.

$$\therefore n = mN\Delta p \text{ and since } K = nC, \therefore K = mN\Delta pC,$$

$$\text{and } \pi = \frac{K}{N} = \frac{mN\Delta pC}{N} = \Delta pmC.$$

$\pi = \Delta pmC$ may be written in the form

$$\pi = m\Delta t \cdot \frac{\Delta p}{\Delta t} \cdot C = T \cdot \frac{\Delta p}{\Delta t} \cdot C.$$

$\Delta p/\Delta t$ is what is called, or what may be called, the average density of probability during the time Δt. Instead of agreeing on some finite value of Δt, it is more practical, since we have made no limitation on the smallness of Δt, to let Δt become infinitesimal, m at the same time becoming infinite, then $\Delta p/\Delta t$ takes the form of a differential quotient and approaches a limit P, which may be called the instantaneous density of probability. Then $\pi = TPC$. While there is no theoretical reason why P in general should be considered constant, we may, from a practical point of view in this case, consider it so to be.

To analyze C, accidents must be classified as to severity. On the basis of a standardized appraisal of the cost of each type of

accidents, such cost being the fair, average compensation for each type of injury, all types of accidents can be grouped in classes, so arranged that the average cost so determined of the accidents in class j will be j times the similar cost of accidents in Class 1. This classification of accidents is irrespective of conditions in the given territory.

The average cost of an accident for the given territory, or C, will then be

$$C = s_1 c_1 + s_2 c_2 + \cdots + s_j c_j + \cdots$$

In this expression claim cost and severity are intermingled. It is possible to separate these elements by writing C in the following form:

$$C = \frac{s_1 c_1 + s_2 c_2 + \cdots + s_j c_j + \cdots}{s_1 + 2s_2 + \cdots + js_j + \cdots} \cdot (s_1 + 2s_2 + \cdots + js_j + \cdots)$$

The expression $s_1 + 2s_2 + \cdots + js_j$ is S, the average severity of accidents in the given territory, each accident being evaluated according to the standardized scale.

The first factor, $\frac{C}{S}$, is V, the index of claim cost for the territory in question; it is namely the ratio of the actual average cost of all accidents in the given territory, the cost of each accident being the amount actually paid, to the average cost of the same accidents when evaluated in terms of the standardized scale.

$$C \text{ then} = VS \text{ and } \pi = TPC = TPSV.$$

Now let us consider each of these four factors separately.

(1) T, the length of time a car is in use per car-year, serves in effect as an index of car-use in the given territory. It depends upon various conditions in the territory, for instance the climate and the temperament and economic status of the people. The fact that T is in the formula has no importance from a preventive point of view and it is important only as an element in the correct measurement of the hazard. There would seem, therefore, to be no point in trying to evaluate it in terms of conditions in the state and community other than by means of the statistical facts regarding actual use of cars.

(2) P, the density of probability of an accident, is the element

in the formula which is most significant from a preventive point of view and we are therefore particularly concerned with those elements in P that will have to do with controllable conditions. However, all conditions must be brought in and these may be classified as follows:

(a) Causes characteristic of or under control of the state.
(b) Causes characteristic of or under control of the community.
(c) Causes characteristic of or under control of the individual.
(d) Causes having to do with the car.
(e) All other causes.

We have assumed that during the unit of exposure not more than one accident is physically possible. The probability of an accident during the time Δt will then be the sum of the probabilities for each of these five causes, and therefore the density of probability will be the sum of the five densities.

For the particular purpose in view, which is a schedule-rating on the basis of state and community conditions, we may consolidate the last three of these five densities of probability into one, namely the density of probability of accident from all causes other than those having to do with the state and the community. It is probably not feasible and it is certainly not desirable in this particular inquiry to deal with the condition of the individual car or with the hazard of the individual driver. The condition of cars in general will come up in considering the probabilities for state and community in the form of whether or not there are state or municipal inspection stations and similarly for the hazard of drivers in general in the given territory. The three elements of the probability of an accident that should be considered in this kind of a study are therefore (1) the probability due to conditions in the state, (2) the probability due to conditions in the community and (3) the probability due to all other conditions.

Now each of these three probabilities will be in turn the sum of a number of different probabilities, each of these secondary elements being the measure of the effect of a particular contributory cause. The recognition of these various causes and the determination of their relative importance forms one of the two major steps in the practical problem of setting up a schedule-rating plan. Some of the causes that can be readily seen to be operative in the

case of state conditions are general underlying conditions involving topography, climate, character of population, etc., conditions regarding the licensing of drivers and conditions regarding enforcement such as existence of highway patrols.

Some of the causes that will be operative in the case of the community involve degree of traffic congestion, traffic engineering conditions, law enforcement conditions and conditions in regard to safety education.

It will be evident that this reasoning is based on the assumption that an accident has only one cause. That of course is contrary to fact; every accident is undoubtedly due to the coexistence of many causal conditions. If the subject were to be analyzed from this point of view it would, however, become an extremely difficult problem in multiple correlation and probably beyond the possibility of practical analysis. It would furthermore almost certainly be beyond the point of practical application in the formulation of a schedule-rating plan. We are therefore, by the practicalities of the situation from both an analytical as well as an administrative point of view, forced to assume, at least in general, that the causes will be uniquely operative as well as disjunctive. It must be remembered that we shall possess only the most primitive means of measuring the effect of causes and a schedule-rating plan must of necessity therefore be only a rough affair at best.

(3) S, the average severity of accidents in the given territory, depends upon various local conditions, notably whether the territory is rural or in the city, severity in general being larger in rural areas on account of higher speeds. To some extent S may depend on claim conditions, for bad claim conditions may result in the faking of accidents or in exaggerating their severity. S is a function of a number of variables but the nature of the function is problematical and is a matter for further study.

(4) V is an index number expressing claim conditions in the territory. It evidently will involve such conditions as methods of choosing juries, activities of Bar Associations and other similar matters. If conditions in the territory are normal V reduces to C_1. V will depend upon a number of variables but the nature of the function is problematical, and this also is a matter for further study.

A mathematical formula serves two purposes. First, it gives the form in which the variables go together and second, where the values of the parameters are known, it leads to a numerical result. In the present case and in all similar analyses, as for instance in the field of experience rating and schedule rating for workmen's compensation insurance, the values of the parameters are not known and the sole value of the analysis lies in the determination of the form of the function. There still remains then the problem of determining the values of the parameters and also the form in which they are to be expressed in terms of conditions in the given territory. T can be obtained statistically but P, S and V, each separated into its various elements, must be obtained through trial and error.

If rate-making in terms of conditions in the given territory can be made to work it should entirely supersede the system of making rates in terms of experience, in other words the two systems are alternative, not supplementary, but all the basic experience that is used in the old system must now be used for checking purposes in the determination of the proper weights to be given to the various elements in the new system and for a continuing check-up throughout. The process of obtaining the values in detail for P, S and V is far the largest part of the job, and whether this can be carried out successfully is exactly the crux of the problem.

It is to be noted that the expression for π is not given in the form of a deviation from a norm but is built up from the ground. Most schedule-rating, however, takes the form of a departure from a base rate. The formula, $\pi = TPSV$, or any similar formula for any other schedule-rating problem, may be made to take such a form by application of Taylor's theorem,

$$f(x+\Delta x, y+\Delta y, \cdots) = f(x, y, \cdots) + \frac{df}{dx}\Delta x + \frac{df}{dy}\Delta y + \cdots + \text{higher powers.}$$

In the present case the development is as follows:

$$\pi = \pi_0 + P_0 S_0 V_0 \Delta T + T_0 S_0 V_0 \Delta P + T_0 P_0 V_0 \Delta S + T_0 P_0 S_0 \Delta V + \cdots$$

$$\text{or } \pi = \pi_0 \left(1 + \frac{\Delta T}{T_0} + \frac{\Delta P}{P_0} + \frac{\Delta S}{S_0} + \frac{\Delta V}{V_0}\right) + \text{higher powers,}$$

where π_0 is the base rate and T_0, P_0, S_0 and V_0 are the values of the corresponding parameters.

This formula shows that the rate corresponding to a given departure from the base rate is had by increasing the base rate by a percentage that is got by adding together the percentage changes in the parameters. It may be noted in passing that the same thing holds true in the case of schedule-rating in fire insurance, since here also the pure premium is the product of factors, in this case expressing (1) the probability of ignition, (2) the probability of combustion and (3) susceptibility to damage.

It may be worthwhile to illustrate the application of this formula by an example. Suppose the basic pure premium is taken to be twenty-five dollars and suppose in the given territory that the index of use of the car is ten per cent less than normal, that is ten per cent less than the condition to which the base rate corresponds, suppose, however, that the probability of accident is fifteen per cent greater, the severity five per cent greater and the index of claim conditions ten per cent greater, then the corresponding value of the pure premium will be $(-10+15+5+10)$ per cent, that is twenty per cent, greater than the basic pure premium and the pure premium will therefore be thirty dollars. The neglect of higher powers in this case has affected the result by less than half of one per cent.

The simplicity of this final formula is encouraging, although the critical question, which involves a world of study and trial, is the determination of the structure and values of P, S and V. It may be remarked again that all that the formula $\pi = TPSV$ indicates is that these four quantities, T, P, S and V, stand in a multiplicative relationship to each other; it gives no clue to their make-up in terms of the causal conditions in the territory. This, therefore, marks only the beginning; it does, however, show the fundamental relationships and it shows what still needs to be done.

CASUALTY INSURANCE ACCOUNTING AND THE ANNUAL STATEMENT BLANK

BY

THOMAS F. TARBELL

FOREWORD

The following is a revision of a paper under the same title, originally prepared by the writer and appearing in *"Proceedings,* Vol. XV, Page 141." The main purpose of the revision has been to reflect changes in item numbers, revised wordings, and treat new items, incorporated in the annual statement blank since the original paper was prepared. The writer has endeavored to clarify certain items and reflect constructive criticisms brought out in the discussion of the original paper.

Methods of casualty insurance accounting are not and probably never will become standardized. Opinions differ as to the most efficient methods of recording and compiling accounting data. The annual statement blank, however, is, with a few unimportant exceptions, uniform for all states and, accordingly, whatever accounting methods are adopted must be designed to permit the assembling of the results to conform with prescribed uniform annual statement requirements.

Insurance accounting is a highly specialized branch of accounting and because of this fact text-books on general or commercial bookkeeping and accounting are not of material benefit to the student of insurance accounting other than to ground him in fundamental principles.

The purpose of this paper is to show briefly the application of general bookkeeping and accounting principles to casualty insurance with particular reference to the requirements of the annual statement blank as respects Income, Disbursements and Ledger Assets.

The principles of double entry bookkeeping debit and credit are necessarily the same for all kinds of business enterprises. A debit represents either expense (decrease of proprietorship), an increase in an asset or a decrease in a liability; a credit represents either income (increase of proprietorship), a decrease in an asset or an increase in a liability. It is fundamental, of course, that for each debit there is a corresponding offsetting credit and vice versa. These principles as applied to casualty insurance will be illustrated in connection with consideration of various annual statement items.

The books of account used by insurance companies are basically the same as those used by other business enterprises and consist of Journal, Cash Book and Ledger. In practice, however, various journals are generally used, each for a specific purpose, and the general ledger is used for controlling or summary accounts only and various subsidiary ledgers maintained for recording details. As examples, most companies maintain separate journals for:—

Premiums written
Premiums paid
Losses paid
Expenses paid

The premium and loss journals are in turn further subdivided to show transactions by line of insurance, and in case of premiums written according to kind of premium transaction (Gross written, Return and Reinsurance); in case of losses paid according to kind of loss transaction (Gross paid, Gross salvage received, Reinsurance received).

The distinction between cash book and journal in insurance accounting as well as in the accounting of most large enterprises is not clearly drawn. As a rule, the cash book is in summary or condensed form, the supporting details being carried in various so-called journals. An illustration in connection with accounting for paid premiums is given at a later point.

A simple illustration of a general ledger controlling account supplemented by subsidiary ledger accounts is the collateral loan account. The general ledger would show only the transactions affecting the general account and a subsidiary ledger would carry the details of the accounts with the individual borrowers.

The most important divisions of the annual statement blank from the financial standpoint are as follows:

1. Income and Disbursements
2. Assets and Liabilities
3. Underwriting and Investment Exhibit

In addition, the statement contains various general interrogatories regarding the conduct of the business and numerous exhibits and supporting schedules, which have no effect upon the financial results but are designed chiefly to enable insurance departments to partially audit the statement results and provide information and publicity considered desirable from a supervisory standpoint.

Statements of most commercial enterprises are prepared upon the so-called "revenue" or "accrual" basis. The books of account show earned income and incurred expenses. Insurance companies' statements of income and disbursements are prepared upon the "cash" basis and the books of account show only cash income (or the equivalent thereof) and paid expenses, subject to a few minor exceptions hereinafter referred to. While the Underwriting and Investment Exhibit of the casualty annual statement blank assembles the year's results on a revenue basis, the difference mentioned above makes it rather difficult for one whose knowledge of accounting and statements has been confined to general commercial accounting or the study of standard accounting textbooks clearly to comprehend the insurance blank.

The principle underlying the casualty annual statement blank is, in fact, rather simple. Expressed as a formula it is as follows:

To: Ledger assets at the beginning of the year
Add or Deduct: Increase or decrease in capital during the year
Add: Cash received during the year
Add: Profit and loss adjustments in ledger assets—Increases
Deduct: Cash disbursed during the year
Deduct: Profit and loss adjustments in ledger assets—Decreases
Balance = Ledger assets at the end of the year

The term cash as used in the above formula means cash or the equivalent thereof and in many instances "net" cash as will be

brought out more fully upon consideration of certain specific income and disbursement items.

The annual statement blank to which all subsequent references are made is that prescribed by the National Association of Insurance Commissioners known as the "Convention Edition" and supplied to the companies for their returns as of December 31, 1940. It should be pointed out that changes in the blank are made yearly and, accordingly, item number references and descriptions of items may change in future editions. The various sections to be considered will be taken up in the order in which they appear in the statement.

Section I—Capital Stock (Page 2)

(See Exhibit 1, Page 298)

Item 1—"Amount of capital paid up December 31 of current year"

This item is merely a memorandum statement of the amount of capital paid up at the end of the year of statement.

Item 2—"Amount of ledger assets (as per balance) December 31 of previous year"

This item, which must agree with Item 32, page 4, of the previous year's statement, is the starting point of the basic formula as set out on page 296 hereof.

Item 3—"—crease of paid-up capital during the year"

This item is not an income item as it is merely an addition to or decrease of capital account. It does, however, represent cash received during the year where an increase is made and, accordingly, enters into the accounting formula. Where capital is increased the bookkeeping entries are:

Debit: Cash
Credit: Capital stock

EXHIBIT 1

2 ANNUAL STATEMENT FOR THE YEAR 1940 OF THE ..... Form 3
(Write or stamp name of Company)

I—CAPITAL STOCK

DOLLARS CENTS

1. Amount of capital paid up December 31 of current year . . . . . $.....
2. Amount of ledger assets (as per balance), December 31 of previous year . . . . . $.....
3. .....crease of paid up capital during the year . . . .

Extended at . . . .

II—INCOME

	(1) *Gross premiums, including policy and membership fees, written and renewed during the year per col. 2, VI, page 7	(2) DEDUCT Return premiums	(3) DEDUCT Reinsurance (written basis)	(4) DEDUCT Total deductions	(5) Net premiums written
4. Accident					
5. Health					
6. Non-cancellable accident and health					
7. Auto liability (a)					
8. Liability other than auto (a)					
9. Workmen's compensation (b)					
10. Fidelity					
11. Surety					
12. Plate glass					
13. Burglary and theft					
14. Steam boiler					
15. Machinery					
16. Auto property damage					
17. Auto collision					
18. Property damage and collision other than auto					
19. (c).....					
20. **Totals					

21. Inspections . . . . . .
22. Gross interest on mortgage loans, per Schedule B, less $.....accrued interest on mortgages acquired during the year . . . . . $.....
23. Gross interest on collateral loans, per Schedule C . . . .
24. Gross interest on bonds $.....and dividends on stocks $.....
less $.....accrued interest on bonds acquired during the year, per Schedule D . . ..
25. Gross interest on deposits in trust companies and banks, per Schedule N . . . .
26. Gross interest from all other sources (give items and amounts):
27. ....
28. ....
29. Gross income from company's property, including $.....for company's occupancy of its own building, less $.....interest on incumbrances, per Schedule A. . . . .
30. Total interest, dividends and real estate income . . . .
31. From other sources (give items and amounts):
32. ..... $.....
33. ....
34. Increase in liabilities during the year on account of reinsurance treaties . . . .
35. Remittances from home office to United States branch (gross) . . . .
36. †Borrowed money gross $.....less amount repaid $..... . . . .
37. From agents' balances previously charged off . . . .
38. Gross profit on sale or maturity of ledger assets, viz:
(a) Real estate, per Schedule A. . . . . $.....
(b) Bonds, per Schedule D . . . .
(c) Stocks, per Schedule D. . . . .
(d) ....
39. Gross increase by adjustment in book value of ledger assets, viz:
(a) Real estate, per Schedule A. . . . . $.....
(b) Bonds, per Schedule D (including $.....for accrual of discount) . . . .
(c) Stocks, per Schedule D . . . .
(d) ....
40. **Total Income** . . . .
41. Amount carried forward .....

*By gross premiums is meant the aggregate of all the premiums written in the policies or renewals issued during the year. Are they so returned in this statement? Answer:.....

**To be supported by distribution of premiums by states as per Schedule T.

(a) Including net premiums on policies issued in previous years. Indicate refunds by minus sign.

1939, $.....; 1938, $.....; 1937, $.....

1936, $.....; 1935, $.....; prior to 1935, $.....

(b) Including net premiums on policies issued in previous years. Indicate refunds by minus sign.

1939, $.....; 1938, $.....; 1937, $.....

1936, $.....; 1935, $.....; prior to 1935, $.....

†Company is at liberty to state transaction briefly, so that explanation can be carried as footnote in department report.

(c) Enter line of business.

SECTION II—INCOME (Page 2)

(See Exhibit 1, Page 298)

Items 4-20—Premium Income

The annual statement blank requires that premiums be reported on a "written" instead of a "paid" basis. Hence, written premiums for statement purposes are considered as the equivalent of cash. Premiums are reported by line of insurance and according to kind of premium transaction. The "net" credit balances of the various premium accounts are shown on the income page.

Since written premiums are credited but the cash not necessarily received until sometime subsequently, it is necessary to set up ledger asset accounts in which to carry the premiums receivable until they are collected. These accounts are known as "Premiums in course of Collection" (Items 9-25, Page 4 of statement).

The bookkeeping entries involved in the various kinds of premium transactions for each line of insurance are as follows:

(1) Gross premiums, etc.
Debit: Premiums in course of collection
Credit: Gross premiums written

(2) Return premiums
Debit: Cancelation, return or "not taken" premiums
Credit: Premiums in course of collection

(4) Reinsurance (written basis)

Gross written

Debit: Reinsurance premiums written
Credit: Reinsurance premiums payable

Not taken and canceled (or return)

Debit: Reinsurance premiums payable
Credit: Reinsurance premiums written

Note that it is not necessary to keep reinsurance premium accounts subdivided according to gross and canceled.

Premiums in course of collection and reinsurance premiums payable receive further consideration in connection with SECTION IV—LEDGER ASSETS (Page 4 of statement).

Item 21—"Inspections"

This item represents income received by a company for inspecting mechanical equipment, usually steam boilers, where a regular inspection and indemnity contract is not carried in the company.

The bookkeeping entries are:

Debit: Cash
Credit: Inspections

Items 22-28—Interest Received on Various Forms of Ledger Assets

These items represent net cash received—gross cash less amount paid for accrued interest, if any. The bookkeeping entries can be best illustrated by an example: Assume a 3% bond for $1000 with interest payable semi-annually acquired at par value plus three months accrued interest. The bookkeeping entries at purchase for the interest part of the transaction would be:

Debit: Bond interest (or bond interest accrued) $7.50
Credit: Cash $7.50

When the next coupon due was collected the entries would be:

Debit: Cash $15
Credit: Bond interest $15

The net interest received would be $7.50.

Item 29—"Gross income from company's property, including $——— for company's occupancy of its own building, less $——— interest on incumbrances, per Schedule A"

This item may involve three accounts—Rents received, Rents paid and Interest on mortgages payable.

The bookkeeping entries for space leased or rented to tenants would be:

Debit: Cash
Credit: Rents received

The bookkeeping entries for rent charged the company by itself for its own occupancy would be:

Debit: Rents paid
Credit: Rents received

The bookkeeping entries in connection with interest paid on incumbrances (mortgages) would be:

Debit: Interest on mortgages payable
Credit: Cash

Items 31-33—"From other sources (give items and amounts):"

These lines are intended to provide for miscellaneous and unusual income or cash received transactions and profit and loss adjustments not otherwise provided for. As an example, surplus paid in by stockholders would be reported in one of these lines. Such surplus is not income but merely an addition to surplus account. The bookkeeping entries would be:

Debit: Cash
Credit: Profit and loss (surplus paid in)

Occasionally companies, in order to provide additional surplus, reduce the par value of their stock and transfer the difference between the amounts at the old and new par values to surplus. In such cases the decrease in capital would be reported in Item 3 and the corresponding surplus gain in one of the Items 32-33 under some such description as "Surplus transferred from capital account." The bookkeeping entries would be as follows:

Debit: Capital
Credit: Profit and loss (capital transferred to surplus)

Item 34—"Increase in liabilities during the year on account of reinsurance treaties"

This is not a true income item and has no effect upon the profit or loss of the company, as the amount is offset by a corresponding liability.

It is a condition of certain reinsurance agreements that the ceding company shall retain a certain percentage of the premium ceded for a certain period of time as a financial guarantee that the reinsuring company (frequently a foreign or alien company not authorized to transact business in the United States) will carry out the terms of the treaty. The amounts so retained are known as "Funds held under reinsurance treaties." Such funds are, in effect, similar to borrowed money (see item 36, page 2 of

statement), since they represent a liability to the reinsuring company as the funds will ultimately be paid over to such company provided the conditions of the treaty are fulfilled. The ceding company does not receive cash from the reinsuring company, but the ceding company's ledger assets are increased since the "Reinsurance premiums payable" account is debited for the amount of such funds. As this is a credit balance account, the effect of debiting the account is to increase the general asset account "Premiums in course of collection." The effect is the same as if the ceding company actually paid the full (100%) amount of reinsurance premiums to the reinsuring company and that company, in turn, returned to the ceding company its check for the portion to be retained by the ceding company. In such a case, there would be an actual cash income item (which would be offset by the corresponding liability item "Funds held under reinsurance treaties"). From the foregoing it is obvious that the amount of funds withheld must be reflected in the income page of the statement in order to preserve the balance of the formula stated on Page 296.

When any part of such funds is paid over to the reinsuring company, the ledger asset "Cash" is decreased by the amount of such payment and such decrease must be reflected in the disbursement page. However, since only the net amount of increase or decrease in ledger assets is of consequence, the blank provides that only such net amount be entered as an income or disbursement item, as the case may be (see also Item 55, EXHIBIT 2—DISBURSEMENTS, Page 3 of statement).

The bookkeeping entries in connection with funds withheld are:

Debit: Reinsurance premiums payable
Credit: Funds held under reinsurance treaties

and in connection with funds paid over to the reinsuring company:

Debit: Funds held under reinsurance treaties
Credit: Cash

Item 35—"Remittances from home office to United States branch (gross)"

This item applies only to the United States branches of foreign (alien) companies. It represents funds supplied by the Home

Office for capital and surplus purposes and is not income. The bookkeeping entries are:

Debit: Cash
Credit: Remittances from home office

Item 36—"Borrowed money gross $——— less amount repaid $———"

Borrowed money does not represent true income and has no effect upon the profit or loss of the company as the amount is offset by a corresponding liability. However, cash is received and the ledger assets are increased and, accordingly, the amount of increase must be reflected in the income page of the statement in order to preserve the balance of the formula stated on Page 296.

Similarly, when borrowed money is repaid, ledger assets are decreased by the cash paid out and the amount of decrease must be reflected in the disbursement page. However, since only the net amount of increase or decrease in ledger assets is of consequence, the blank provides that only such net amount be extended as an income or disbursement item, as the case may be (see also Item 57, EXHIBIT 2—DISBURSEMENTS, Page 3 of statement).

The bookkeeping entries at the time the money is borrowed are:

Debit: Cash
Credit: Borrowed money

and at the time of repayment

Debit: Borrowed money
Credit: Cash

Item 37—"From agents' balances previously charged off"

This item arises when a balance due from an agent and charged off as uncollectible is subsequently recovered. The bookkeeping entries are as follows:

Debit: Cash
Credit: Profit and loss (Agents' balances)

This item is further discussed in connection with Item 59, Page 3 of statement, "Agents' balances charged off," and Items 8-25, EXHIBIT 3—LEDGER ASSETS, Page 4 of statement.

Item 38—"Gross profit on sale or maturity of ledger assets"—Real estate, Bonds, Stocks or other ledger assets

The profit (or loss) on sale of ledger assets is the difference between the book value (not the actual cost, unless book value and actual cost are the same) at date of sale and the sale price. The bookkeeping entries for the profit portion are:

Debit: Cash
Credit: Profit and loss—profit on sale of (real estate, bonds, stocks or other ledger assets)

There are two methods of accounting for profit and loss items in general use. One method (that followed in this paper) is to charge or credit such items as profit or loss on sale direct to a single controlling Profit and Loss ledger account and maintain subsidiary accounts for the details required by the annual statement. The second method is to carry separate profit and loss ledger accounts for each such annual statement item. Where the second method is followed the account credited in the above example would be "Profit on sale of (real estate, bonds, stocks or other ledger assets)."

Item 39—"Gross increase by adjustment in book value of ledger assets"—Real estate, Bonds, Stocks or other ledger assets

This item does not represent cash income or profit but is in the nature of accrued income or profit. Some companies follow the practice of maintaining the book values of real estate, bonds and stocks at approximately the market values. Profit and loss entries are made at the end of the year to bring the book values up to the approximate market values. The bookkeeping entries are:

Debit: Real estate, bonds, stocks or other ledger assets (book value)
Credit: Profit and loss—Increase by adjustment in book value of (real estate, bonds, stocks or other ledger assets)

In case of bonds a further use is made of this item by companies which value their bond holdings on the amortization basis, which is common practice at the present time as such basis is required by

at least one state. If a bond is acquired at a discount, the effective rate of interest will be in excess of the nominal rate. Assume that the nominal (coupon) rate is 3%, the purchase price 98 and the term to maturity 9½ years. The effective rate of interest, as determined by reference to any standard table of bond values is 3¼%. If the bond were carried upon the books at $980 until maturity, a false profit on maturity of $20 would be shown and the interest income during the period would be too small, since it is reasonable to assume that the effective rate of 3¼% represents a fair interest return on funds invested at the time of purchase of the bond. The company would, however, receive only the nominal interest of 3% during the term of the bond, the additional interest being deferred and accumulated at the effective rate until maturity. Such deferred interest would be taken credit for by adding the yearly accrual to the book value of the bond. The bookkeeping entries would be:

Debit: Bonds (book value)
Credit: Profit and loss—accrual of bond discount

The foregoing is an exception to the general rule that the statement is based upon cash income or receipts.

It will be shown upon consideration of SECTION IV—ASSETS (Page 4 of statement) that increases (or decreases) by adjustment are unnecessary so far as the effect of changes in security values upon surplus and total admitted assets are concerned. They do, however, affect the amount of ledger assets.

Item 40—"Total Income"

This is the sum of the extended amounts of Items 20, 21, 30 and 33-39.

Item 41—"Amount carried forward"

This is the sum of the ledger assets at beginning of year, plus or minus the increase or decrease in capital during the year, and total income (Item 40).

EXHIBIT 2

Form 3 ANNUAL STATEMENT FOR THE YEAR 1940 OF THE.....
(Write or stamp name of Company)

3

Amount brought forward,

III—DISBURSEMENTS

	(1) Gross amount paid for losses	(2) DEDUCT Gross salvage (Sched. H)	(3) DEDUCT Reinsurance	(4) DEDUCT Total deduction	(5) Net amount paid policyholders for losses
1. Accident					
2. Health					
3. Non-cancellable accident and health					
4. Auto liability					
5. Liability other than auto					
6. Workmen's compensation					
7. Fidelity					
8. Surety					
9. Plate glass					
10. Burglary and theft					
11. Steam boiler					
12. Machinery					
13. Auto property damage					
14. Auto collision					
15. Property damage and collision other than auto					
16. (a).....					
17. TOTALS					

18. Investigation and adjustment of claims, viz:
19. Accident $.....; Health $.....; Non-cancellable accident and health $.....;
20. Auto liability $.....; Liability other than auto $.....; Workmen's compensation $.....;
21. Fidelity $.....; Surety $.....; Plate glass $.....;
22. Burglary and theft $.....; Steam boiler $.....; Machinery $.....;
23. Auto property damage $.....; Auto collision $.....; Property damage and colls on other than auto $.....;
24. (a)..... $.....;
25. Policy and membership fees retained by agents . . . . . $.....
26. Commissions or brokerage, less amount received on return premiums and reinsurance for the following classes
27. Accident $.....; Health $.....; Non-cancellable accident and health $.....;
28. Auto liability $.....; Liability other than auto $.....; Workmen's compensation $.....;
29. Fidelity $.....; Surety $.....; Plate glass $.....;
30. Burglary and theft $.....; Steam boiler $.....; Machinery $.....;
31. Auto property damage $.....; Auto collision $.....; Property damage and colls on other than auto $.....;
32. (a)..... $.....;
33. Salaries and all other compensation of officers, directors, trustees and home office employees.
33(a). Pension, retirement and other similar benefits
34. Home office travel
35. Salaries, traveling and all other expenses of branch offices and agents, excluding commissions
36. Salaries, traveling and all other expenses of payroll auditors
37. Inspections, including accident prevention $.....; medical examiners' fees and salaries $.....
38. Rents, including $.....for company's occupancy of its own buildings
39. General office maintenance and expense
40. Taxes, licenses and fees:
    (a) State taxes on premiums . . . . . $.....
    (b) Insurance department
    (c) Other state taxes, including $.....social security
    (d) Federal, including $.....social security
    (e) All other (except on real estate)
41. Legal expenses $.....; advertising $.....; printing and stationery $.....
42. Postage, telegraph, telephone, exchange and express $.....; insurance $.....
43. Furniture and fixtures $.....; books, newspapers and periodicals $.....
44. Bureau and association dues and assessments
45. Miscellaneous underwriting expense (itemize).....
46.
47.
48. Real estate: (a) repairs and expenses $.....; (b) taxes $.....
49. Miscellaneous investment expense (itemize)..... $.....
50.
51. Stockholders for dividends (amount declared during the year, cash $.....; stock $.....)
52. Policyholders for dividends, less $.....dividends received from reinsuring companies
53. Other disbursements (itemize).....
54.
55. Decrease in liabilities during the year on account of reinsurance treaties
56. Remittances to home office from United States branch (gross)
57. Borrowed money repaid gross $.....less amount borrowed $.....
58. Interest on borrowed money
59. Agents' balances charged off
60. Gross loss on sale or maturity of ledger assets, viz:
    (a) Real estate, per Schedule A . . . . . $.....
    (b) Bonds, per Schedule D
    (c) Stocks, per Schedule D
    (d)
61. Gross decrease, by adjustment, in book value of ledger assets, viz:
    (a) Real estate, per Schedule A . . . . . $.....
    (b) Bonds, per Schedule D (including $.....for amortization of premiums)
    (c) Stocks, per Schedule D
    (d)
62. Total Disbursements
63. BALANCE

DOLLARS CENTS

(a) Enter line of business.

SECTION III—DISBURSEMENTS (Page 3)

(See Exhibit 2, Page 306)

Items 1-17—Losses Paid

Accounting procedure in connection with losses paid is comparatively simple so far as annual statement requirements are concerned. The bookkeeping entries for each of the various kinds of loss transactions for each line of business are as follows:

(1) Gross amount paid for losses

Debit: Losses
Credit: Cash

(2) Gross salvage

Debit: Cash
Credit: Salvage recovered

(3) Reinsurance

Debit: Cash
Credit: Reinsurance recovered

In cases where salvage has been recovered on a paid loss under which there was reinsurance the original company would refund to the reinsuring company its proportion of the salvage recovery. The bookkeeping entries on payment to the reinsuring company would be:

Debit: Reinsurance recovered
Credit: Cash

At first glance it would appear that this method of accounting is incorrect and that the bookkeeping entries should be:

Debit: Salvage
Credit: Cash

It will be noted, however, that the heading "Gross" precludes any debit entries to the salvage account and an example will show that the prescribed method is correct.

Assume that a company pays a gross loss of $1000 and that the risk is one-half reinsured. The statement as respects this item would appear as follows:

Gross Amount Paid	Salvage	Reinsurance	Total Deduction	Net Amount Paid
$1,000.00	.....	$500.00	$500.00	$500.00

If $500 salvage were subsequently received the statement under the prescribed method would show:

(a) Gross Amount Paid	Salvage	Reinsurance	Total Deduction	Net Amount Paid
$1,000.00	$500.00	$250.00	$750.00	$250.00

and under the incorrect method:

(b) Gross Amount Paid	Salvage	Reinsurance	Total Deduction	Net Amount Paid
$1,000.00	$250.00	$500.00	$750.00	$250.00

Since reinsurance applies to the net loss sustained by a company, method (a) is obviously correct as it shows reinsurance equal to 50% of the net loss — $250.00 ÷ ($1000.00 — $500) and method (b) incorrect since it shows reinsurance equal to 66⅔% of the net loss — $500.00 ÷ ($1000.00 — $250.00).

Reinsurance is usually collected sometime after the gross loss is paid. This results in reinsurance recoverable and some companies prefer to credit this to loss account immediately. This procedure is similar in theory to the crediting of written premiums. To accomplish this result a ledger asset account "Reinsurance recoverable on paid losses" is set up and the bookkeeping entries become:

Debit: Reinsurance recoverable (on paid losses)
Credit: Reinsurance recovered

Items 18-50 and 53 and 54—Expenses

These items cover various underwriting (claim, acquisition, administration, inspection, tax and bureau) and investment (real estate and other) expenses. No special accounting procedure is involved except in connection with claim, Items 18-24, branch office, Item 35, payroll audit, Item 36, and inspection, Item 37, expenses. The usual bookkeeping entries are:

Debit: Expense (by item)
Credit: Cash

Claim expense is divided into two parts—allocated and unallocated. Allocated expense is that chargeable to specific claims, such as attorneys' and court fees, cost of medical examinations (in public liability claims) and cost of appraisals (in case of property damage losses). Unallocated claim expense consists of the general overhead cost of maintaining claim service, both in the field

and at the Home Office, comprising such items as salaries, traveling expense, rent, heat, light, printing and stationery, furniture and fixtures, etc. Separate ledger accounts are maintained for assigned loss expense by line the same as in the case of losses. Separate ledger accounts are also usually maintained for claim salaries and claim traveling expense, but not by line of insurance. The problem of determining what proportion of field and home office rent, heat, light, printing and stationery, furniture and fixtures, should be charged to claim expense and the further distribution of such proportions plus claim salaries and claim traveling expenses to the various lines of insurance involves the application of advanced cost accounting principles and the treatment of this phase of accounting, even briefly, is beyond the scope of this paper.

Problems similar to those involved in determining unallocated claim expense are encountered in determining branch office, payroll audit and inspection expense, since these expenses are also made up of salaries, traveling expense, rent, heat, light, printing and stationery, furniture and fixtures, etc.

It is obvious from the foregoing that the disbursements as shown on Page 3 of the statement will not check with the Trial Balance as respects many items—salaries, traveling expense, rents, printing and stationery, furniture and fixtures, etc.

Item 51—"Stockholders for dividends (amount declared during the year, cash $———; stock $———)"

This item requires no special comment. The provision for showing in parenthesis dividends declared during the year is to provide a check on the liability for unpaid dividends, Page 5 of statement. The bookkeeping entries involved in the dividend account are as follows:

Debit: Dividends paid
Credit: Cash

Item 52—"Policyholders for dividends, less $——— dividends received from reinsuring companies"

This item is peculiar to mutual companies or stock companies writing participating contracts. It involves no unusual account-

ing principles. Note, however, that dividends paid are net—gross paid less dividends received from reinsuring companies. Separate accounts are maintained—one for gross dividends and the other for reinsurance dividends. The bookkeeping entries are as follows:

Gross dividends paid
Debit: Dividends to policyholders
Credit: Cash

Reinsurance dividends received
Debit: Cash
Credit: Reinsurance dividends

Item 55—"Decrease in liabilities during the year on account of reinsurance treaties"

This item is explained in connection with Item 34, Page 2 of statement.

Item 56—"Remittances to home office from United States branch (gross)"

This item is the opposite of Item 35, Page 2, and represents surplus funds returned to home office. The bookkeeping entries are:

Debit: Remittances to home office
Credit: Cash

Item 57—"Borrowed money repaid gross $——— less amount borrowed $———"

This item is explained in connection with Item 36, Page 2 of statement.

Item 58—"Interest on borrowed money"

This item is self-explanatory. The bookkeeping entries are, of course:

Debit: Interest on borrowed money
Credit: Cash

Item 59—"Agents' balances charged off"

These are profit or loss items representing the charge-off of balances considered as uncollectible.

There are two types of such items. One arises from errors in agents' paid premium reports or incorrect remittances discovered upon audit of reports in either the branch or home office. If a premium or commission is incorrectly reported or the amount of the net remittance of the agents is incorrect, the correct premium or commission amounts are charged or credited to the appropriate accounts and the difference or balance is charged or credited to a ledger asset account generally known as "Agents' sundry balances" (see EXHIBIT 3—OTHER LEDGER ASSETS, Items 27-31, page 4 of statement). These differences or balances are usually adjusted in subsequent reports, but if for any reason a company is unable to collect such a balance from an agent, the balance is charged off to profit and loss through the above account. The bookkeeping entries are:

Debit: Profit or loss (Agents' balances charged off)
Credit: Agents' sundry balances

The other type arises where an agent has collected premiums from assureds but has failed to remit them to the company. These are termed defalcations or "shortages." This type of case is usually cleared directly to profit and loss. Since the premiums actually have been paid, it is necessary to clear them from the "Premiums in course of collection" account. The transaction is carried out by the preparation of a dummy paid-premium voucher providing the following bookkeeping entries (assuming premiums of $1,000 and commissions of $250):

	Debit	Credit
Profit and loss (Agents' balances charged off)	$ 750.00	.....
Commissions	250.00	.....
Premiums in course of collection	.....	$1,000.00
	$1,000.00	$1,000.00

Item 60—"Gross loss on sale or maturity of ledger assets"—Real estate, bonds, stocks or other ledger assets

This is the opposite of Item 38, Page 2. The bookkeeping entries, so far as the loss on sale is concerned, are:

Debit: Profit and loss—loss on sale of (real estate, bonds, stocks or other ledger assets)
Credit: Real estate, bonds, stocks or other ledger assets (book value)

The bookkeeping entries for both Items 38, Page 2, and 60, Page 3, are further illustrated in the consideration of SECTION IV —LEDGER ASSETS (Page 4 of statement), Item 4—"Book value of bonds"

Item 61—"Gross decrease by adjustment in book value of ledger assets"—Real estate, bonds, stocks or other ledger assets

This item is the reverse of Item 39, Page 2. For ordinary adjustments to bring the book value down to the market value the bookkeeping entries are:

Debit: Profit and loss—increase by adjustment in book value of (real estate, bonds, stocks or other ledger assets)
Credit: Real estate, bonds, stocks or other ledger assets (book value)

In case of companies valuing their bonds on the amortization basis the process is the reverse of that illustrated in connection with Item 39, Page 2. If a bond is acquired at a premium the effective rate of interest will be less than the nominal rate. Assume that the nominal (coupon) rate is 4%, the purchase price 111 and the term to maturity 20 years. The effective rate of interest would be 3¼%. Under these circumstances the excess of the nominal interest over the effective interest would be used to amortize the premium over the term of the bond so that at maturity the bond would stand on the books at its par value. The bookkeeping entries would be:

Debit: Profit and loss—amortization of bond premiums
Credit: Bonds (book value)

Item 62—"Total Disbursements"

This item is the sum of the extended amounts of Items 17, 24, 47, 48 and 50-61.

Item 63—"Balance"

This item is the difference between the item "Amount brought forward" at the top of the page and Item 62. It balances with Item 32, Page 4 of statement (see Exhibit 3, Page 314).

SECTION IV—ASSETS (Page 4)

(See Exhibit 3, Page 314)

This section is divided into three subsections:

(1) Ledger Assets
(2) Non-Ledger Assets
(3) Assets Not Admitted

(1) LEDGER ASSETS

Items 1-4—Investments—Real estate, Mortgage loans, Collateral loans, Bonds and Stocks

These items call for the book values of the various forms of investments. It should be noted that Item 1 provides for the deduction of incumbrances from the book value of real estate and the showing of only the net value as a ledger asset. This is not in accordance with the usual accounting practice of showing the gross value as an asset and mortgage incumbrances as a liability.

When an investment is made the bookkeeping entries are:

Debit: Real estate, mortgage loans, etc.
Credit: Cash

When an investment matures or is disposed of the bookkeeping entries are:

Debit: Cash
Credit: Real estate, mortgage loans, etc.

EXHIBIT 3

4 ANNUAL STATEMENT FOR THE YEAR 1940 OF THE _____ Form 3
(Write or stamp name of Company)

IV—LEDGER ASSETS

		DOLLARS	CENTS	DOLLARS	CENTS
1.	Book value of real estate (less $_____ incumbrances), per Schedule A				
2.	Mortgage loans on real estate per Schedule B, first liens $_____ other than first_____				
3.	Loans secured by pledge of bonds, stocks or other collateral, per Schedule C				
4.	Book value of bonds, $_____; and stocks, $_____, per Schedule D				
5.	Cash in company's office $_____				
6.	Deposits in trust companies and banks not on interest, per Schedule N				
7.	Deposits in trust companies and banks on interest, per Schedule N				
8.	Gross premiums, less return premiums and reinsurance, in course of collection, viz:				

		(1) On policies or renewals effective on or after October 1 of current year	(2) On policies or renewals effective prior to October 1 of current year
9.	Accident	$_____	$_____
10.	Health		
11.	Non-cancellable accident and health		
12.	Auto liability		
13.	Liability other than auto		
14.	Workmen's compensation		
15.	Fidelity		
16.	Surety		
17.	Plate glass		
18.	Burglary and theft		
19.	Steam boiler		
20.	Machinery		
21.	Auto property damage		
22.	Auto collision		
23.	Property damage and collision other than auto		
24.	(a)_____		
25.	TOTALS	$_____	$_____
26.	Bills receivable		
27.	Other ledger assets, viz:		
28.	_____		$_____
29.	_____		
30.	_____		
31.	_____		
32.	**Ledger Assets, as per Balance on page 3**		

NON-LEDGER ASSETS

33.	Gross interest due, $_____ and accrued, $_____ on mortgages, per Schedule B				
34.	Gross interest due, $_____ and accrued, $_____ on collateral loans, per Schedule C, Part I				
35.	Gross interest due, $_____ and accrued, $_____ on bonds, not in default, per Schedule D, Part I				
36.	Gross interest due, $_____ and accrued, $_____ on other assets (give items and amounts):				
37.	_____				
38.	Gross rents and interest due, $_____ and accrued, $_____ on company's property or lease				
39.	Market value of real estate over book value, per Schedule A				
40.	*Market / Amortized or investment value (not including interest in item 35) of bonds over book value, per Schedule D				
40A.	Market value of stocks over book value, per Schedule D				
41.	Other non-ledger assets, viz:				
42.	_____		$_____		
43.	_____				
44.	**Gross Assets**				

DEDUCT ASSETS NOT ADMITTED

45.	Company's stock owned, $_____; loans on, $_____		$_____		
46.	Supplies, printed matter and stationery				
47.	Furniture, fixtures and safes				
48.	Gross premiums in course of collection effective prior to October 1 of current year				
49.	Bills receivable				
50.	Loans on personal security, endorsed or not				
51.	Deposits in suspended banks, less $_____ estimated amount recoverable				
52.	Book value of real estate over market value, per Schedule A				
53.	Book value of bonds over *market / amortized or investment value, per Schedule D				
53A.	Book value of stocks over market value, per Schedule D				
53B.	Interest due and accrued on mortgage loans (state basis)				
53C.	_____				
54.	Other assets not admitted, viz:				
55.	_____				
56.	_____				
57.	_____				
58.	**Total Admitted Assets**				

(a) Enter line of business.
*Strike out "Market" or "Amortized or investment."

Where there is a profit or loss on sale or maturity at least three and in some instances four accounts are affected. Examples using the sale of a bond at a profit and a loss will illustrate. Assume that a bond carried at a book value of $980 is sold for par ($1000) and accrued interest of $15. The bookkeeping entries would be as follows:

	Debit	Credit
Cash	$1,015.00	.....
Bonds (book value)	.....	$ 980.00
Profit and loss—profit on sale of bonds	.....	20.00
Bond interest	.....	15.00
	$1,015.00	$1,015.00

If the book value and sale amounts were reversed, i.e., book value $1000 and sale price $980 plus accrued interest of $15, the bookkeeping entries would be as follows:

	Debit	Credit
Cash	$ 995.00	.....
Bonds (book value)	.....	$1,000.00
Profit and loss—loss on sale of bonds	20.00	.....
Bond interest	.....	15.00
	$1,015.00	$1,015.00

Item 5—"Cash in company's office"

This item is self-explanatory. It includes within its scope actual cash and cash items—checks, drafts and money orders.

In order to conveniently record the various bookkeeping entries arising from either of the above transactions, a voucher would be prepared showing the four debits and credits. The cash would be posted in the cash book and the other entries in a journal designed to provide for entries such as the foregoing. Many companies maintain what is known as a cash-journal, a combination of cash book and journal, and in such cases all four entries would be posted in this book.

Items 6 and 7—Deposits in Trust Companies and Banks

Heretofore in all examples of bookkeeping entries involving actual receipts and disbursements, it has been assumed that such receipts and disbursements have been in the form of cash and for

simplicity of illustration "Cash" has been used as the account involved. In practice, however, only a small part of the actual business transactions of an insurance company involve actual cash but are represented by check receipts and disbursements. Accordingly, companies maintain, in addition to a pure cash account, separate ledger accounts with various banks. Checks received are usually charged to cash through the medium of the cash book and subsequently credited to cash and charged to the bank of deposit. Debit may be, and frequently is, made direct to the bank without the intermediate step of passing through the cash book. Under the latter conditions the bookkeeping debit would be to "Bank" instead of to "Cash." As an example the bookkeeping entries in connection with rents received (see page 300) would be:

Debit: Bank (by name)
Credit: Rents received

Disbursements, except for petty cash items, are almost invariably made by check and charged direct to the bank upon which they are drawn. Using gross losses paid, for example, the bookkeeping entries in actual practice (see Page 307) would be:

Debit: Losses
Credit: Bank (by name)

Items 8-25—"Gross Premiums, less return premiums and reinsurance, in course of collection"—(by line of insurance)

The function of these items has been explained in connection with the consideration of Items 4-20, Page 2 of statement. The significance of the word "Gross" is usually interpreted as meaning "without deduction of commissions." These accounts consist of the net amount of unpaid direct and assumed reinsurance premiums (gross, less not taken and return) minus the net amount of reinsurance ceded premiums payable.

When premiums are collected two asset and one disbursement accounts are affected, since premiums are remitted "net" (less commissions) by agents. Cash is debited, premiums in course of collection are credited and commissions are debited. If premiums

to the gross amount of $1000, with a commission rate of 25% were remitted, the bookkeeping entries would be:

	Debit	Credit
Cash (or bank)	$ 750.00	.....
Premiums in course of collection	.....	$1,000.00
Commissions paid	250.00	.....
	$1,000.00	$1,000.00

On payment of reinsurance ceded premiums by the company the bookkeeping entries, assuming gross reinsurance ceded premiums of $1000 and a commission rate of 35%, would be:

	Debit	Credit
Cash (or bank)	.....	$ 650.00
Reinsurance premiums payable	$1,000.00	.....
Commissions paid	.....	350.00
	$1,000.00	$1,000.00

In actual practice the bookkeeping is handled somewhat differently from the simple illustrations above. In case of direct business a summary of the premium, commission and any other charges or credits and the net cash remitted, usually referred to as a "Paid Premium Report" or "Account Current," would accompany the remittance. Using this as a voucher the net cash would be debited on the cash book or to the bank and the remaining items posted to the paid premium journal. At the end of the month the total debits and credits would be posted therefrom to the appropriate ledger accounts—premiums in course of collection, commissions and expense (by account), if any.

Item 26—"Bills receivable"

This item is of slight consequence in the accounts of insurance companies and involves no special accounting consideration. If a note were accepted from an agent for a balance due for premiums, the bookkeeping entries would be the same as in the foregoing illustration except that bills receivable would be debited instead of cash or bank. When the note was paid, the bookkeeping entries would be:

Debit: Cash (or bank)
Credit: Bills receivable

Items 27-31—"Other ledger assets, viz:"

The more important items usually found in these lines are "Reinsurance recoverable on paid losses," referred to in connection with the consideration of paid losses, Items 1-17, Page 3 of statement, and "Agents' sundry balances," referred to in connection with consideration of Item 59, Page 3 of statement.

When the reinsurance recoverable mentioned on page 308 is actually paid by the reinsuring company, the bookkeeping entries are:

Debit: Cash (or bank)
Credit: Reinsurance recoverable on paid losses

An example of an entry affecting the "Agents' sundry balances" account would be the case where an agent in reporting a premium of $1000 carrying a commission rate of 12½% incorrectly computed the commission at 15%. The bookkeeping entries would be:

	Debit	Credit
Cash (or bank)	$ 850.00	.....
Agents' sundry balances	25.00	.....
Premiums in course of collection	.....	$1,000.00
Commissions paid	125.00	.....
	$1,000.00	$1,000.00

Item 32—"Ledger Assets, as per Balance on Page 3"

This item is the sum of Items 1-4, 7, 25, 26 and 31, and, as indicated and also previously pointed out, must agree with Item 63, Page 3.

With the exception of "Capital," "Funds held under reinsurance treaties," "Borrowed money" and a few other ledger liability items of rather infrequent occurrence, all items which are derived from the Trial Balance of a company have been considered and the main purpose of the paper accomplished. Accordingly, consideration of the balance of the financial statement is made as brief as possible.

(2) Non-Ledger Assets

Items 33-37—Interest due and accrued on various ledger assets

These items are necessary to compute the actual interest earned during the year. Their determination is mainly a matter of the arithmetical computation and summarization of detail items.

Item 38—"Gross rents and interest due, $——— and accrued, $——— on company's property or lease"

This item is similar to Items 33-37. The inclusion of the words "or lease" is to take care of the case where a company leases a building or a portion thereof and subleases a part or parts thereof to other tenants. The rent received from subleases is reported as a credit to rents—Item 38, Page 3 of statement.

Item 39—"Market value of real estate over book value, per Schedule A"

Insurance companies are required to compile their statements upon market values of assets. If the market value exceeds the book value, the excess is treated as a non-ledger asset.

*Item 40—"*Market / Amortized or investment } value (not including interest in Item 35) of bonds over book value, per Schedule D"*

* Strike out "Market" or "Amortized or investment."

This item is similar to Item 39. The alternative provisions for "Market" or "Amortized or investment" are included to provide for the particular basis on which a company values its bonds. They are not optional provisions, which would permit a company to use the higher of the two values. For example, if a company values its bonds on the amortized basis, which is the usual practice (see Item 39, Page 2), it must use the amortized values in determining the amount to be entered in Item 40, regardless of whether such values are greater or less than the market values.

Item 40A—"Market value of stocks over book value, per Schedule D"

This item is similar to Items 39 and 40 and requires no particular comment.

Items 41-43—"Other non-ledger assets, viz:"

These items are to provide for unusual or infrequent non-ledger assets. In the case of a company which does not credit losses for

reinsurance recoverable at the time of paying the gross loss (see comments on reinsurance losses, page 308) but only upon collection of the reinsurance the "Reinsurance recoverable on paid losses" would be carried as a non-ledger asset.

Item 44—"Gross Assets"

This item which is self-explanatory is the sum of Items 32, 38-40A and 43.

(3) Assets Not Admitted

From the "Gross Assets" certain deductions are made to arrive at the "Admitted Assets." These deductions consist of (1) assets of doubtful value in fact or arbitrarily so classified by law or rulings of insurance departments and (2) excesses of book values of assets over market (or amortized) values.

Item 45—"Company's stock owned, $———; loans on, $———"

Such items are of rare occurrence. Their treatment as non-admitted assets is, of course, logical.

Items 46 and 47—"Supplies, printed matter and stationery" and "Furniture, fixtures and safes"

The treatment of the above items as non-admitted assets is open to question. Supplies, printed matter and stationery have a certain asset value, especially to a going concern, and furniture and fixtures unquestionably have an asset value, both on the basis of a going concern and because of their resale value. The fact that no asset value is permitted for these items is probably due to difficulties incident to a proper appraisal of their worth.

In view of the fact that no asset value is permitted for the above items, most companies carry no asset accounts for the same but treat all purchases as expense.

Item 48—"Gross premiums in course of collection effective prior to October 1 of current year"

This item is similar to the item frequently found in the statements of manufacturing and merchandising corporations under

the caption "Reserve for bad debts." It should be noted, however, that insurance companies are not permitted to exercise any judgment in determining the amount of the item but are required to consider all premiums outstanding more than three months as uncollectible or of no value. Experience shows that as a matter of fact only a small proportion of such items are eventually charged off as uncollectible.

Items 49 and 50—"Bills receivable" and "Loans on personal security, endorsed or not"

The treatment of these items in their entirety as non-admitted assets is open to debate. Notes may be taken from agents as a last resort to effect collection of premium balances. On the other hand, notes or interest bearing warrants sometimes issued by municipalities in payment of premiums and assumed by a company from its agents are usually perfectly good assets. Loans on personal security are of rare occurrence in the statements of insurance companies and their treatment of non-admitted assets works no great hardship. Banks make loans on personal security and such loans, if not in default, are considered as good assets. However, it is a part of a bank's business to make loans to individuals whereas this function is not necessary to the operation of an insurance company.

Item 51—"Deposits in suspended banks, less $——— estimated amount recoverable"

This item is a result of the "depression" and was introduced in the blank in 1931. It is self-explanatory and is of little consequence at the present time.

Items 52-53A—Book value of ledger assets over market value—Real estate, bonds and stocks

These items are the reverse of Items 39-40A. If the book value exceeds the market value (or amortized value, in case of bonds) the excess is treated as a non-admitted asset.

In computing the excess of market values of the various ledger

assets over the corresponding book values the excesses for each particular asset are "net" and not "gross." If a company owned five pieces of real estate, on three of which the market value exceeded the book value and on the other two the book value exceeded the market value, the net excess would be entered in either Item 39 or Item 52.

As pointed out on page 305, increases (or decreases) by adjustment of ledger assets are unnecessary so far as the effects of changes in security values upon surplus are concerned, since such changes in surplus are automatically reflected in Items 40 and 40A or 53 and 53A, Page 4. A simple example will illustrate. Assume that a bond carried upon the books at $990 has a market value of $1,000. If an increase by adjustment is made, the effect upon the statement is as follows:

Increase by adjustment.....	$10.00	(Increase in surplus)
Increase in ledger assets.....	10.00	
Market value of bonds over book value	0	
Increase in gross assets.....	10.00	
Increase in admitted assets.....	10.00	

If the increase by adjustment is not made, the effect upon the statement is as follows:

Increase by adjustment.....	0	
Increase in ledger assets.....	0	
Market value of bonds over book value	$10.00	(Increase in surplus)
Increase in gross assets.....	10.00	
Increase in admitted assets.....	10.00	

Item 53B—"Interest due and accrued on mortgage loans (state basis)"

This is also a "depression" item, incorporated in all statement blanks in 1936 because of the considerable number of loans on which interest became in default. It is of greater importance in the case of life companies than in the case of casualty companies, since the latter as a rule do not invest extensively in mortgage loans. Its purpose, as indicated, is to provide for the deduction as a non-admitted asset of any interest due and accrued, included in Item 33, which may reasonably be assumed to be uncollectible. No specific rules for computing such deduction are in effect, but it is obvious that a conservative policy should be adopted.

Items 54-57—"Other assets not admitted, viz:"

These lines are to provide for the excesses of book over market values of any ledger assets not specifically provided for and for any other non-admitted assets.

Item 58—"Total Admitted Assets"

This item is the difference between Item 44 and the extended amount of Item 57.

Section V—Liabilities (Page 5)

(See Exhibit 4, Page 324)

With the exception of "Capital," "Borrowed money," "Funds held under reinsurance treaties" and a few other unimportant ledger liabilities the various items of liabilities are not taken from the books of account but are determined by inventory and formula methods. The most important items are the claim and unearned premium reserves, which usually account for from 80% to 85% of the total liabilities excluding capital. In addition to the claim and unearned premium reserves specific provision is made for liabilities or reserves for claim expense, commissions due or to become due, salaries and other expenses due or accrued, taxes due or accrued, declared and unpaid dividends, interest due or accrued including interest on borrowed money.

It seems unnecessary to comment upon each individual item of this section, and to attempt to describe the methods, formulae and accounting practices prescribed for or adopted by the companies is beyond the scope of this paper.

The difference between the "Total Admitted Assets," Item 58, Page 4, and the sum of "Total amount of all liabilities, except capital," Item 48, and "Capital paid up," Item 49, produces the "Surplus over all liabilities," or company surplus, Item 50.

Item 51, the sum of Items 49 and 50, is designated as the "Surplus as regards policyholders."

Item 52, "Total," is the sum of Items 48 and 51 and, as indicated, balances with Item 58, Page 4.

EXHIBIT 4

Form 3 ANNUAL STATEMENT FOR THE YEAR 1940 OF THE .....
(Write or stamp name of Company)

5

V—LIABILITIES

	(1) Adjusted or in process of adjustment	(2) Resisted	(3) Deduct reinsurance per Schedule E column (2)	(4) Net unpaid claims excluding incurred but not reported	(5) Incurred but not reported	(6) Total net unpaid claims except liability and workmen's compensation claims (excluding expenses of investigation and adjustment)
1. Losses and claims:						
2. Accident						(d)
3. Health						(d)
4. (c) Non-cancellable accident and health						(d)
5. Fidelity						
6. Surety						
7. Plate glass						
8. Burglary and theft						
9. Steam boiler						
10. Machinery						
11. Auto property damage						
12. Auto collision						
13. Property damage and auto. other than auto						
14. (a).....						
15. TOTALS						

	DOLLARS	CENTS
16. Reserve for unpaid liability losses . . . . . $..... and workmen's compensation losses	$.....	
17. Reserve for credit losses on policies expiring in October, November and December of current year, being fifty per cent of $....., gross premiums received on said policies, less $..... paid on losses under said policies		
18. Reserve for accrued losses on credit policies in force December 31 of current year, being fifty per cent of $..... earned premiums on said policies, less $..... paid on losses under said policies .		
19. Total unpaid claims		
20. Estimated expenses of investigation and adjustment of unpaid claims:		
21. Accident $.....; Health $.....; Non-cancellable accident and health $.....; Fidelity $.....		
22. Surety $.....; Plate glass $.....; Burglary and theft $.....; Steam boiler $.....		
23. Machinery $.....; Auto prop. damage $.....; Auto collision $.....; Property damage and liability other than auto $.....		
24. (b)..... $.....; ..... $.....; ..... $.....; ..... $.....		
25. Total unearned premiums as shown by recapitulation, page 7.		
25½ (c) Additional reserve on non-cancellable accident and health policies $....., less $..... reserve on policies reinsured		
26. Commissions, brokerage and other charges due or to become due to agents or brokers on policies effective on or after October 1, of current year, viz:		
27. Accident $.....; Health $.....; Non-cancellable accident and health $.....; Auto liability $.....		
28. Liability other than auto $.....; Workmen's compensation $.....; Fidelity $.....; Surety $.....		
29. Plate glass $.....; Burglary and theft $.....; Steam boiler $.....; Machinery $.....		
30. Auto prop. damage $.....; Auto collision $.....; Property damage and liability other than auto $.....; (b)..... $.....		
31. Salaries, rents, expenses, bills, accounts, fees, etc., due or accrued		
32. Estimated amount due or accrued for taxes		
33. Dividends declared and unpaid to stockholders, $....., to policyholders, $.....		
34. Due and to become due for borrowed money		
35. Interest due or accrued including $..... on borrowed money		
36. Funds held under reinsurance treaties		
37. Other liabilities, viz:		
38.	$.....	
39.		
40.		
41.		
42.		
43.		
44.		
45.		
46.		
47.		
48. Total amount of all liabilities, except capital		
49. *Capital paid up	$.....	
50. Surplus over all liabilities		
51. Surplus as regards policyholders		
52. **Total**		

(a) Enter "Credit (on policies expiring prior to October of current year)," or other lines of business.
(b) Enter lines of business.
(c) State reserve basis and describe methods used.
(d) Including $..... for present value of life indemnity claims.
*Mutual Companies to enter here the amount of guaranty or other permanently designated funds with appropriate description.

Underwriting and Investment Exhibit

(See Exhibit 5, Pages 326 and 327)

The underwriting and investment exhibit corresponds to what is designated in general commercial accounting as the "Profit and Loss" account. In this exhibit the statement is transformed (in summary form) from a "cash" to a "revenue" basis and, in addition, shows the gains or losses from various sources and the disposition thereof. The exhibit is divided into three main parts as follows:

(1) Underwriting exhibit
(2) Investment exhibit
(3) Miscellaneous exhibit

The various subdivisions of Part (1) arranged in debit and credit order are:

	Debit		Credit
Premiums earned	..		X
Losses incurred	X		..
Loss adjustment expenses incurred	X		..
Underwriting expenses incurred	X		..
Underwriting profit and loss items	X	or	X

The net balance (Item 41) of the foregoing produces the net gain or loss from underwriting, including underwriting profit and loss.

The various subdivisions of Part (2) arranged in debit and credit order are:

	Debit	Credit
Interest and rents earned	..	X
Investment expenses incurred	X	..
Profit on investments	..	X
Loss on investments	X	..

The net balance (Item 68) of the foregoing produces the net gain or loss on investments, including investment profit and loss.

The various subdivisions of Part (3) arranged in debit and credit order are:

	Debit		Credit
Dividends declared to stockholders	X		..
Dividends declared to policyholders	X		..
Remittances from home office	..		X
Remittances to home office	X		..
Increase (or decrease) in special reserves	X	or	X
(Gain or loss) from other sources	X	or	X

The net balance (Item 78) of the foregoing produces the net

EXHIBIT 5

8 ANNUAL STATEMENT FOR THE YEAR 1940 OF THE _____ Form 3
(Write or stamp name of Company)

UNDERWRITING AND INVESTMENT EXHIBIT

Showing the Sources of the Increase and Decrease in Surplus During the Year

UNDERWRITING EXHIBIT			Gain in Surplus	Loss in Surplus
PREMIUMS				
1.	Total premiums, per item 20, page 2			
2.	Add unearned premiums and additional reserve December 31 of previous year, per item 4 of last year's exhibit			
3.	Total			
4.	Deduct unearned premiums and additional reserve Dec. 31 of current year, per items 25 and 25½, page 5			
5.	**Premiums earned during the year**			
LOSSES				
6.	Losses paid, per item 17, page 3			
7.	Add salvage and reinsurance recoverable December 31 of previous year, per item 9 of last year's exhibit			
8.	Total			
9.	Deduct salvage and reinsurance recoverable December 31 of current year, per items (a)....., page 4			
10.	Balance			
11.	Add unpaid losses December 31 of current year, per item 19, page 5			
12.	Total			
13.	Deduct unpaid losses December 31 of previous year, per item 11 of last year's exhibit			
14.	**Losses incurred during the year**			
LOSS ADJUSTMENT EXPENSES				
15.	Loss adjustment expenses paid during the year, per item 24, page 3			
16.	Add loss adjustment expenses unpaid December 31 of current year, per item 24, page 5			
17.	Total			
18.	Deduct loss adjustment expenses unpaid December 31 of previous year, per item 16 of last year's exhibit			
19.	**Loss adjustment expenses incurred during the year**			
UNDERWRITING EXPENSES				
20.	(c) Underwriting expenses paid during the year, per disbursement exhibit, page 3			
21.	(a) Add underwriting expenses unpaid December 31 of current year, per liabilities exhibit, page 5, viz:—			
22.	Total			
23.	Deduct underwriting expenses unpaid December 31 of previous year, per item 21 of last year's exhibit			
24.	**Underwriting expenses incurred during the year**			
25.	**Underwriting losses and expenses**			
26.	(b).....**from underwriting during the year**			
UNDERWRITING PROFIT AND LOSS ITEMS				
27.	Gain from:			
28.	Inspections, per item 21, page 2			
29.	Agents' balances previously charged off, per item 37, page 2			
30.	Other underwriting income, per income exhibit, page 2(a)			
31.	Total			
32.	Loss from:			
33.	Agents' balances charged off, per item 59, page 3			
34.	Other underwriting disbursements, per disbursement exhibit, page 3, other than losses and expenses, per items 6, 15 and 20 of this exhibit (a).....			
35.	Total			
36.	(b).....from items 27 to 35			
37.	Bills receivable and premiums in course of collection not admitted December 31 of previous year, per item 38 of last year's exhibit $.....			
38.	Bills receivable and premiums in course of collection not admitted December 31 of current year, per items 48 and 49, page 4 $.....			
39.	(b).....from items 37 and 38			
40.	(b).....**from profit and loss items**			
41.	(b).....**from underwriting and profit and loss items during the year** (carried forward)			

(a) Give statement number of each item or portion thereof included herein
(b) Write "Gain" or "Loss".
(c) In order to secure uniformity in the reports of the various companies, all companies are directed to include in this item all disbursements, except payments to policyholders, per item 17, page 3; agents' balances charged off, in item 59, page 3; loss adjustment expenses; repairs, expenses and taxes on real estate; such other taxes and fees as apply to investments and personal property only; dividends to stockholders; loss on sale or maturity and decrease in book value of ledger assets, and such other items, if any, as are known to apply exclusively to the assets of the company, and to deduct from the total of said items as investment expenses one-eighth of one per cent. of the mean invested assets, viz: Real estate owned, mortgage loans, collateral loans and stocks and bonds owned.

EXHIBIT 5—Continued

Form 3 ANNUAL STATEMENT FOR THE YEAR 1940 OF THE _____ 9
(Write or stamp name of Company)

		Gain in Surplus	Loss in Surplus
	INVESTMENT EXHIBIT		
42.	Brought forward		
	INTEREST AND RENTS		
43.	Interest, dividends and rents received during the year, per item 30, page 2, less item 58, page 3, and less $.....amortization and plus $.....accrual		
44.	Deduct interest, dividends and rents due and accrued December 31 of previous year, per item 46 of last year's exhibit		
45.	Balance		
46.	Add interest, dividends and rents due and accrued December 31 of current year, per item 38, page 4, less the sum of item 35, page 5, and item 53B, page 4		
47.	Add interest and rents paid in advance December 31 of previous year, per item 49 of last year's exhibit		
48.	Total		
49.	Deduct interest and rents paid in advance December 31 of current year, per liability exhibit, page 5		
50.	**Gross interest, dividends and rents earned during the year**		
	INVESTMENT EXPENSES		
51.	(d) Investment expenses paid during the year, per disbursement exhibit, page 3. (Attach exhibit).....		
	.....		
	.....		
	.....		
52.	Deduct investment expenses unpaid December 31 of previous year, per item 54 of last year's exhibit		
53.	Balance		
54.	(a) Add investment expenses unpaid December 31 of current year, per liabilities exhibit, page 5, viz:—.....		
	.....		
55.	**Investment expenses incurred during the year**		
56.	**Net interest, dividends and rents earned during the year**		
	PROFIT ON INVESTMENTS		
57.	Gain from sale of ledger assets, per item 38, page 2		
58.	Gain from increase in book value of ledger assets, other than for accruals, per item 39, page 2		
59.	Gain from change in difference between book and market value during the year		
60.	Gain from other investments, viz:—(Give items and amounts).....		
61.	**Profit on investments during the year**		
	LOSS ON INVESTMENTS		
62.	Loss from sale of ledger assets, per item 60, page 3		
63.	Loss from decrease in book value of ledger assets, other than for amortization, per item 61, page 3		
64.	Loss from change in difference between book and market value during the year.		
65.	Loss from other investments, viz:—(Give items and amounts).....		
66.	**Loss on investments during the year**		
67.	(b).....**from investment profit and loss items**		
68.	(b).....**from investments during the year**		
69.	Total gains and losses from underwriting and investments		

		Gain in Surplus	Loss in Surplus
	MISCELLANEOUS EXHIBIT		
70.	Dividends declared to stockholders during the year		
71.	Dividends declared to policyholders during the year		
72.	Remittances from home office (gross)		
73.	Remittances to home office (gross)		
74.	.....crease in special reserves		
75.	(a), (b).....from other sources:		
76.	.....		
77.	.....		
78.	Net (b).....from items 70-77		
79.	Total gains and losses in surplus during the year		
80.	Surplus December 31 of previous year, per item 81 of last year's exhibit		
81.	Surplus December 31 of current year, per item 50, page 5		
82.	.....**crease in surplus during the year** (enter in column to balance)		
83.	Totals		
84.	Per cent. of losses incurred to premiums earned.....		
85.	Per cent. of loss adjustment expenses incurred to premiums earned.....		
86.	Per cent. of underwriting expenses incurred to premiums earned.....		
87.	Per cent. of investment expenses incurred to gross interest and rents earned.....		

(a) Give statement number of each item or portion thereof included herein.
(b) Write "Gain" or "Loss".
(d) Include in this item one-eighth of one per cent. of the mean invested assets; repairs, expenses and taxes on real estate; such other taxes and fees as apply to investments and personal property only; and such other items, if any, as are known to apply exclusively to the assets of the company.

gain or loss in surplus from miscellaneous sources after deduction of dividends to stockholders (and/or policyholders) and special reserve adjustments.

The algebraic sum (+ = credit balance or gain; − = debit balance or loss) of the net balances of the three subdivisions produces the net increase or decrease in surplus during the year—Item 82.

The various items of the underwriting and investment exhibit are all obtainable from Sections I-V of the current year's annual statement and Sections IV, V and the underwriting and investment exhibit of the previous year's statement. It should be pointed out that in arriving at the investment expenses paid during the year it is arbitrarily assumed—see footnote (d), Page 9 of statement—that a portion of general expense equal to 1/8 of 1% of mean invested assets (Items 1-4, Page 4 of statement) is chargeable to investments in addition to all specific investment expense. In order to preserve the statement balance, this arbitrary amount is deducted from underwriting expenses paid (Item 20, Page 8 of statement).

The earned income and incurred losses and expenses are determined from the cash income, cash disbursements, non-ledger assets, non-admitted assets and non-ledger liabilities by means of the following basic formulae:

Earned Income

(1) To: Cash income (net)
(2) Add: The current year's non-ledger asset
(3) Add: The previous year's non-ledger liability (or liabilities)
(4) Deduct: The previous year's non-ledger asset
(5) Deduct: The current year's non-ledger liability (or liabilities)
(6) Balance = Earned income

The foregoing formula applies to the subsections headed Premiums and Interest and Rents.

Incurred Losses and Expenses

(1) To: Cash disbursements
(2) Add: The current year's non-ledger liability (or liabilities)

(3) Add: The previous year's non-ledger asset
(4) Deduct: The previous year's non-ledger liability (or liabilities)
(5) Deduct: The current year's non-ledger asset
(6) Balance = Incurred losses (or expenses)

The foregoing formula applies to the subsections headed Losses, Loss Adjustment Expenses, Underwriting Expenses and Investment Expenses.

The above formulae are inclusive so to speak. For example, in determining earned premiums (first formula) only Items (1), (3) and (5) are used in most instances as Items (2) and (4) are usually "O". Similarly, in determining incurred expenses (second formula) only Items (1), (2) and (4) are used in most instances as Items (3) and (5) are usually "O".

The items included in Lines 27-35, Page 8 of statement and Lines 57, 58, 62, 63, 72 and 73, Page 9 of statement, do not involve non-ledger items but are taken direct from the income or disbursement pages.

Gains or losses involving only non-ledger assets, non-admitted assets, or non-ledger liabilities and not income and disbursements are determined by taking the differences between such items in the current and previous year's statements. These include the following:—Item 39, Page 8 of statement, and Items 59 or 64, 60 or 65 and 74, Page 9 of statement.

In the case of companies which value their bonds on the amortization basis, the net amount of the increases for accrual of discount and the decreases for amortization of premiums is reported as interest in Item 43, Page 9 of statement instead of in Items 58 and 63 respectively. This procedure is in harmony with the theory of valuation on the amortized basis, since the effective interest and not the nominal interest should be credited to interest account.

Conclusion

The revised paper is intended, as was the original paper, to serve merely as an introduction to the subject of casualty insurance bookkeeping and accounting and as a necessarily limited exposition of the requirements of the financial section and the underwriting and investment exhibit of the casualty annual

statement blank. As stated in the writer's review of the discussion of the original paper, "the paper was prepared primarily for students of our Society engaged in statistical and actuarial work and having some text-book knowledge of bookkeeping and accounting but little, if any, contact with the company books of account. The paper was intended to show briefly the rationale of the annual statement and the application of bookkeeping and accounting principles to the various insurance accounts."

It is the intention of the writer to present at a subsequent meeting a revision of the original supplemental paper, "Exhibits and Schedules of the Casualty Annual Statement Blank, *Proceedings*, Vol. XVI, Part I."

Since the original paper was presented, additional texts and papers bearing upon the subject of casualty insurance accounting in general and certain specialized phases thereof have been published. For purposes of ready reference, the following bibliography, including previous and subsequent material, is submitted:

Hull, R. S.: Casualty Insurance Accounting.

Michelbacher, G. F. and Associates: Casualty Insurance Principles. Chapter 19.

Bailey, W. B.: The Allocation of Adjusting Expense to Line of Insurance. P.C.A.S. XIV, 233.

Perryman, F. S.: The Theory of the Distribution of the Expenses of Casualty Insurance. P.C.A.S. XVII, 22.

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.

Report of Committee on Uniform Method of Expense Distribution (New York Casualty Experience Exhibit). Association of Casualty and Surety Accountants and Statisticians.

THE NEW YORK MOTOR VEHICLE SAFETY RESPONSIBILITY ACT

BY

HAROLD M. JONES

The governor has just signed the Page-Anderson Bill giving New York a new automobile financial responsibility law to be effective January 1, 1942. Although not a compulsory insurance law, it is the nearest thing to such a law that has been adopted since the Massachusetts Compulsory Act.

The automobile highway safety problem has become so serious that compulsory automobile insurance proposals have been made in various states including New York. It is because the same problem is confronting other states that the decision of New York, a model for many states, is of more than local interest.

It had been known for some time that the Superintendent of Insurance of New York favored compulsory insurance as the answer to the highway safety question and a bill sponsored by him, proposing such legislation, was introduced in the legislature this year. There was no organized support and it was apparent soon that this was not the year for compulsory insurance. However, both the proponents and opponents of compulsory insurance were in agreement that the existing financial responsibility law failed to meet requirements and that a change was needed. Within two months two very similar bills outlining new financial responsibility laws, both based on the New Hampshire Act, were introduced in the legislature and it is one of these which has become law.

The advocates of the new financial responsibility law pointed out that under the 1937 New Hampshire Law the percentage of insured automobiles increased from 36 to 75. They also, argued that the financial responsibility law is more likely to make the average driver safety-conscious than a compulsory law and that the reduction of accidents is of primary importance and payment of damages secondary. This was to counter the Superintendent's statement that even an increase in insured automobiles to over 70% still left a substantial number uninsured.

The Superintendent, despite his opinion that compulsory insurance was the real answer indicated that since the times were un-

favorable for such a proposal, the Insurance Department would approve a revised financial responsibility law as a step in the right direction.

Commencing in 1942, many more automobile owners and drivers than ever before will have to give evidence of financial responsibility, and many others will voluntarily buy insurance to avoid the penalties which will be theirs in the event of an accident or violation of the law.

The Commissioner of Motor Vehicles may suspend or revoke license to operate and registration certificates and plates *upon any reasonable ground* until proof of financial responsibility is given, but such action is mandatory under certain conditions. The Act provides no limit to the period during which proof must be furnished and proof once demanded must be continued as long as a license or registration is issued to the motorists, unless the conviction or judgment is reversed on appeal to the court.

The new law is entitled "The New York Motor Vehicle Safety Responsibility Act" and provides for the filing of proof by operators and owners for

1. Conviction of certain violations of the motor vehicle law.
2. Failure to satisfy a judgment arising out of an automobile accident.
3. Involvement in an automobile accident.

Each of these divisions is reviewed below.

1A. Proof of financial responsibility shall be required of persons convicted of certain infractions of the Motor Vehicle Law.

The Commissioner *shall* suspend or revoke the operator's or chauffeur's license of any person upon receiving record of the conviction of such person for:

Homicide or assault arising out of operation of a motor vehicle

Leaving scene of an accident after personal injury without report or identification.

Leaving scene of an accident after property damage without report or identification

Knowingly making false statement in application for registration

Operating while intoxicated

Three or more over-speeding convictions within 18 months.

1B.

The Commissioner *may* at his discretion suspend or revoke the operator's or chauffeur's license of any person upon receiving record of any of the aforementioned without conviction or physical or mental disability or disability by reason of intoxication or drugs or for

Conviction of a felony

For persistent and habitual violation of motor vehicle laws, rules, regulations and ordinances relative to motor vehicle traffic

Gross negligence in operation or operating with reckless disregard for life and property of others

Knowingly permitting motor vehicle to be used in commission of a crime

Preventing lawful identification or evading lawful arrest or prosecution while operating a motor vehicle

For wilfully evading lawful prosecution in this or another state or jurisdiction for an offense against the motor vehicle or traffic laws.

Provision is made in the law for reporting by Court Clerks to Commissioner of Motor Vehicles of all motor vehicle convictions (major offense) requiring or allowing suspension or revocation of operator licenses.

Whenever the Commissioner suspends or revokes the operator's or chauffeur's license of any person convicted of any of the offenses listed above, he shall also suspend any and all registration certificate and plates issued for any motor vehicle registered in the name of such person unless such owner has previously given or shall immediately give and thereafter maintain proof of financial responsibility in the future for each and every automobile owned and registered by him.

Such suspension or revocation shall remain in effect and the Commissioner shall not issue any new or renewal license or registration until permitted under the Act and not then until such person gives proof of future financial responsibility.

The Commissioner shall take the same action for any offense committed in another state or province as if it occurred in New York.

For the purposes of this law the term conviction shall include

a forfeiture of bail or collateral deposited to secure a defendant's appearance in court upon a charge conviction for which requires or authorizes the Commissioner to suspend or revoke the license of such person.

This section of the law is generally the same as in most financial responsibility laws with certain variations in the list of offenses. A similar provision existed in the previous New York Financial Responsibility Act.

2. Proof of Financial Responsibility Required for Failure to Satisfy Certain Judgments.

The Commissioner shall suspend the license to operate and registration certificates and plates issued to any person who has failed for a period of fifteen days to satisfy any judgment for damages because of bodily injury to or death of any person or any judgment in excess of twenty-five dollars for damage to or destruction of property arising out of the ownership, maintenance, use or operation of any motor vehicle.

A judgment shall be considered satisfied when $5,000 is paid for bodily injury to or death of one person or $10,000 for bodily injuries to or death of more than one person, and when $1,000 is paid for damage to property. Suspension of license and registration will be waived if judgment debtor gives proof of financial responsibility and obtains permission from the court to pay the judgment in installments.

However, until such judgment is satisfied or stayed or the debtor has obtained a release or a judgment in his favor and until the judgment debtor has given proof of future financial responsibility the suspension shall remain in effect and no new or renewal license or registration shall be issued to him by the Commissioner.

Court Clerks will report to the Commissioner of Motor Vehicles all judgments in automobile cases.

Up to this point the principal change in this section is in the reduction in the minimum property damage judgment for operation of the law from one hundred dollars to twenty-five dollars.

In the following New York has taken a step which has no prototype in the New Hampshire Act or any other.

The Motor Vehicle involved in the accident resulting in the un-

satisfied judgment shall not be registered in New York in the name of any person until the person whose licenses have been suspended satisfies the judgment, obtains a stay or a release or a judgment in his favor and gives proof of future financial responsibility.

This ruling will not only prevent the transfer of the automobile to some other member of the household but makes it more difficult for the judgment debtor to dispose of his car. Only a receiver or trustee in bankruptcy, a judgment creditor, and in some cases a lien or mortgage holder, can take possession and legally register it in New York. Therefore, if sold, the car must be sold out of state to a non-resident and the fact that it cannot be registered in New York may affect the sale price.

The holder of a lien or mortgage on an automobile owned by a judgment debtor will be exempted from the prohibition against registering the automobile *only* if such lien or mortgage was taken before the Act became effective. Thus, the holder of a lien or mortgage taken on or after January 1, 1942, will not be able to repossess the automobile as long as the judgment remains unpaid. Obviously, the finance companies, banks and organizations who loan money with an automobile as security are going to insist that such automobile be insured against liability for bodily injury and property damage.

There is some possibility that finance companies, banks, etc. will try to buy a special insurance policy to cover the risk of a financed car being tied up by the Act. It does not appear, however, that such an arrangement would be in the public interest.

3. Security for and Proof of Future Financial Responsibility Required After an Accident.

Not less than ten days or more than forty-five days after receipt of the report of an accident resulting in bodily injury to or death of a person or in damage to property in excess of twenty-five dollars the Commissioner shall suspend the license of any person operating, and the registration certificates and plates of the owner of any motor vehicle involved, unless the operator or owner or both shall have previously furnished or immediately furnishes sufficient security to satisfy any judgments for damages arising out of such accident and until the operator or owner or both give proof of future financial responsibility. However, if such operator or

owner can produce evidence that the liability for damages resulting from the accident is insured by a liability policy or by a bond of the necessary limits, the Commissioner shall not require security or proof of financial responsibility from such operator or owner.

In lieu of a deposit of security as required the motor vehicle owner or operator may, with the consent of the person who was injured or whose property was damaged, contract to pay the judgment in installments. Failure to pay any installment will result in immediate suspension of the license and registration certificate and plates of the judgment debtor until the judgment is satisfied. Any such arrangement for satisfying the judgment shall not avoid the requirement for furnishing evidence of future financial responsibility.

Under the law as adopted all drivers involved in an automobile accident—innocent and guilty, must file reports with the Motor Vehicle Commissioner regardless of the amount of damage done. Failure to report an accident will result in suspension or revocation of license. However, an amendment is being considered for the next session of the legislature whereby only accidents involving bodily injury or damage to property in excess of $25 need be reported. It is also proposed to amend the law to require proof of financial responsibility after an accident from only the driver found to be at fault.

If the injured person does not bring suit within one year from the date of the accident, the Commissioner may issue in the name of the person whose license and registration certificates were suspended, new license and registration certificates provided such person furnish evidence of future financial responsibility.

By requiring neither security nor proof of financial responsibility of an owner or operator who can show insurance for damage resulting from an accident, the Act enables persons who voluntarily carry insurance to avoid application of this section. Knowledge of this should stimulate voluntary insuring of many automobiles.

Non-resident Application.

The law shall be applied to non-residents in the same manner as to residents by suspending the right of a non-resident operator to drive and by forbidding the operation of any motor vehicle

registered by a non-resident owner in New York until requirements of the Act are met.

Amount and Method of Showing Proof.

The amount of proof required and method of showing proof of financial responsibility are generally the same as under the preceding law. The only important change permits a non-resident to give proof of financial responsibility by filing a certificate of insurance of an insurance carrier admitted in the non-resident's state even though not admitted in New York provided such carrier meet certain requirements.

Expense of Administering the Act.

The provision for raising funds to administer the Act was added when certain members of the legislature would not approve the bill unless a specific means of raising funds was included.

The total of all expenses incurred in connection with the administration of the Act will be assessed upon all insurance carriers, self-insurers and persons who gave proof of financial responsibility by bond or deposit of money or securities in proportion to the number of motor vehicles for which proof of financial responsibility was furnished by them.

It is provided that not more than the highest number of motor vehicles registered in the name of any person at one time during the fiscal year shall be counted with respect to such person in making the assessment.

The adoption of a direct assessment upon the insurance carriers is a departure from the usual method of raising funds to administer such a law and there is some concern as to what lengths this idea may be carried. In general, these costs come from the general funds.

Under the new law in theory the motorist will pay these costs as a part of his insurance rate where previously they were borne by all taxpayers. While this is probably a fairer distribution of expenses than before, it puts the insurance carriers in the position of underwriting the bureau. In order to compute the rate increase necessary to produce the additional income, the costs of administration, and the increase in the number of insured automobiles

must be estimated. And, while desirable from the public angle, it further complicates matters for the carriers that the administration of the Act will not be hampered by any budget limitation.

The new Act will certainly increase the number of insured drivers and should increase safety consciousness among motorists and on these grounds can be considered an advance. It is admitted that the Act has defects and already means of correcting some of these are being considered for the next session of the legislature. The cost and difficulty of administration at this time appear to be weaknesses which will provoke later discussion. In the opinion of the Commissioner of Motor Vehicles the cost of administration which is estimated to be about $1,000,000 is much greater than the cost of a compulsory law. The machinery for detecting and obtaining proof from persons subject to the Act will be cumbersome and in many instances slow moving because of inevitable disputes. The determination of the amount of damage immediately after an accident will be very much a matter of opinion, and where the amount of such damages will decide whether a motorist must carry insurance forever after, there will be arguments.

By voluntarily agreeing to establish a plan for assigning undesirable risks, the insurance carriers have avoided any need for including such a provision in the Act. The carriers recognize that a state regulated assigned risk plan is the forerunner of a state insurance fund. The voluntary plan for handling assigned risk will probably follow those in effect in Maine, New Hampshire, and other states.

ABSTRACT OF THE DISCUSSION OF PAPERS READ AT THE PREVIOUS MEETING

A 1940 VIEW OF NON-CANCELLABLE DISABILITY INSURANCE

JARVIS FARLEY

VOLUME XXVI, PAGE 18

WRITTEN DISCUSSION

MR. JOHN H. MILLER:

In his very comprehensive and thorough paper Mr. Farley has clearly expressed the important, yet intangible, factor covering non-cancellable accident and health experience; namely, that it is largely a function of human behavior. The difficulties that have arisen in the past in connection with this form of insurance have, to a considerable degree, been due to a failure to recognize this fact.

Non-can has its own arithmetic in which two and two may equal six, and five minus one may equal three. These relationships simply illustrate the fact that the average man will be disabled longer if he is indemnified at $50 per week than if at $25, usually not because he is dishonest, but because at the smaller indemnity economic necessity will send him back to work, perhaps too soon, while at the larger indemnity his doctor's and family's advice and his own desire may persuade him to remain at home until his recovery and convalescence are full and complete.

Mr. Farley questions whether lifetime indemnity can possibly be written on any adequate scale. There is good reason to believe that, with the knowledge of underwriting that has been acquired together with that which could be obtained through additional research, such coverage could be written. However, the selection would have to be so severe and the standards of acceptance so high that the venture would probably prove impracticable from the sales standpoint.

In connection with underwriting, there has been a considerable change over the years with regard to the occupational hazard. While there are wide variations between the cost of disability in different occupations, the cause seems to be not so much the

actual physical hazard of the occupation as other characteristics of the occupation, such as regularity of employment, stability of income, and whether or not the occupation involves regular hours at a definite location.

Mr. Farley explains the important part which the agent has in the successful underwriting of non-can. This feature of the business cannot be overstressed. There is perhaps no other line of insurance in which the character and good faith of the insured is more important. It is certainly obvious that policyholders of the desired type cannot be secured by agents who do not measure up to these standards themselves or who have not sufficient understanding and training to appreciate the importance of proper selection.

In non-can the field selection as well as the home office selection involve considerations different from those involved in life insurance selection. For this reason neither the agent, nor the lay underwriter, nor the medical examiner schooled in life insurance is competent to engage in non-can underwriting without considerable specialized training in the problems of disability insurance. The distinctions between non-can and life or any other form of insurance seem to require a special organization, both in the office and in the field, for its successful conduct. It is generally conceded that the unfortunate experience which the life companies had with disability insurance was due, in no small part, to the failure to underwrite the disability portion of the contract independent of the life insurance.

Along with increased underwriting knowledge and a desire to issue the broadest coverage that can be offered with due regard to conservative management, the trend in non-can policies has generally been toward fewer and fewer restrictions. Restrictions in the contract are, with few exceptions, merely a substitute for proper underwriting. As the underwriting becomes more effective, restrictions at one time felt to be indispensable are removed.

On page 49, Mr. Farley states that H_x is the equivalent of ${}^{\omega}C'_x$. A demonstration of the equivalence of the two may be of interest and may serve to illustrate the relationship between the two types of notation. In order to simplify the comparison, let us consider a benefit of 1 payable immediately upon disablement and annually thereafter during the continuance of disability.

Adapting formula (A)* on page 47 to the annual basis, without elimination period, we have

$$H_z^{o/all} = v^{z+\frac{1}{2}}\, l_{z+\frac{1}{2}} \cdot s_{(z)}^{o/1} + v^{z+3/2}\, l_{z+\frac{1}{2}} \cdot s_{(z)}^{1/1} + v^{z+5/2}\, l_{z+\frac{1}{2}} \cdot s_{(z)}^{2/1} + \text{etc.}$$

Defining $s_{(z)}^{n/1}$ as $\dfrac{r_z\ l_z}{l_{z+\frac{1}{2}}} \cdot \dfrac{l_{z+n+\frac{1}{2}}^{\,i}}{l_{z+\frac{1}{2}}^{\,i}}$† (using mixed life functions)

$$H_z^{o/all} = v^{z+\frac{1}{2}}\left[l_{z+\frac{1}{2}} \frac{r_z\ l_z}{l_{z+\frac{1}{2}}} \cdot \frac{l_{z+\frac{1}{2}}^{\,i}}{l_{z+\frac{1}{2}}^{\,i}} + v\, l_{z+\frac{1}{2}} \frac{r_z\ l_z}{l_{z+\frac{1}{2}}} \cdot \frac{l_{z+3/2}^{\,i}}{l_{z+\frac{1}{2}}^{\,i}} + \cdot\cdot \right]$$

$$= v^{z+\frac{1}{2}}\, l_z \cdot r_z \left[\frac{l_{z+\frac{1}{2}}^{\,i} + v\, l_{z+3/2}^{\,i} + \cdots\cdots\text{etc.}}{l_{z+\frac{1}{2}}^{\,i}} \right]$$

$$= v^{\frac{1}{2}}\, D_z \cdot r_z \cdot\ a_{z+\frac{1}{2}}^{\,i}$$

$$= {}^{\omega}C_z^r \text{ (annual basis)}$$

It follows that $K_z^{o/all}$, which is the summation of $H_z^{o/all}$, is the equivalent of ${}^{\omega}M_z^r$, which is the summation of ${}^{\omega}C_z^r$.

In the practical application of the two types of notation different approximations are used and, hence, exact equivalence of monetary results would not be achieved. The differences, however, will be negligible if the approximations are reasonably accurate.

Mr. Farley states the formula generally used in developing the active life reserve. In practice, there is little or no occasion to use the terminal reserve factors and accordingly it is often possible to minimize the computations by figuring the mid-terminal reserves direct. This can be done most readily by the following adaptation of Mr. Farley's formula (10).††

$$(10A) \qquad {}_{n-\frac{1}{2}}V_x = \tfrac{1}{2}\left\{ \frac{{}_yK_{x+n-1}}{D_{x+n-1}} + \frac{{}_yK_{x+n}}{D_{x+n}} \right\} - \frac{{}_yK_x}{{}_yN_x} \cdot \tfrac{1}{2} \cdot \left\{ \frac{{}_yN_{x+n-1}}{D_{x+n-1}} + \frac{{}_yN_{x+n}}{D_{x+n}} \right\}$$

* In the third line following formula (A) a typographical error was noted, $\frac{1}{2}p_x$ should read $\frac{1}{2}p_z$.

† This differs from Mr. Cammack's definition, P. C. A. S., VII, 276, which is in the British form and uses Hunter's r_x, which is actually $p_x{}^{ai}$. This formula is true only in case of an annual benefit, but is a fair approximation for monthly or weekly benefits after the first two years of disablement.

††The last factor in formula (10) should read $\dfrac{{}_yK_x}{{}_yN_x}$ rather than $\dfrac{{}_yK_x}{{}_yN_t}$.

This formula can be applied by continuous process as follows:

$$(10B)_{n+\frac{1}{2}}V_{x-1} - {}_{n-\frac{1}{2}}V_x = \left(\frac{{}_yK_x}{{}_yN_x} - \frac{{}_yK_{x-1}}{{}_yN_{x-1}}\right) \cdot \tfrac{1}{2} \cdot \left\{\frac{{}_yN_{x+n-1}}{D_{x+n-1}} + \frac{{}_yN_{x+n}}{D_{x+n}}\right\}$$

The initial value can be obtained by use of formula (10A) and additional values can be obtained by successive multiplication of the premium differences, working upward on the diagonal. By this method each reserve factor, after the first year, is calculated by a single multiplication.

The table on page 56 shows an average reduction in premiums of about 2½% resulting from a one point increase in the interest assumption. Although this comparison assumes no interest on the claim reserves, the difference would be slight even with the claim annuities figured at interest. Under shorter term policies the saving would be still less, particularly if there is an increase in premium at attained age 50, or other age, and a subsequent reduction in benefits. This relatively small reduction certainly does not justify the taking of investment risks in the hope of securing a better yield. The author's admonition of conservatism in investment policy is very proper, particularly since there is so little to be gained and so much to be lost through any other course.

The reasons for the use of preliminary term valuation are ably presented in this paper. This basis of valuation simply recognizes the fact that acquisition costs and other disbursements in the first year leave no balance available for the establishment of a reserve, while, if the premiums are properly computed, adequate margin is provided in the renewal years for the accumulation of the necessary reserve.

Both the preliminary term and the net level premium method take into account the incidence of claim costs. The net level premium method ignores the true incidence of expenses while the preliminary term method makes allowance for the marked excess of first year over renewal expenses. There does not appear to be any more theoretical justification for ignoring the incidence of expenses than there would be for ignoring the incidence of losses. Both losses and expenses are taken into account in computing

the premiums to be charged. Both must be met if the company is to continue to fulfill its obligations and both should be provided for in the valuation method employed.

Mr. Farley has done the business a fine service in writing a paper which so thoroughly and carefully covers the field of non-can insurance. It should be used as a guide book by any who may consider entering this field.

MR. W. C. JOHNSON:

A distinguished citizen of New England once wrote a letter to the Chairman of the Committee of Admissions of a very conservative club, which, for brevity and clarity should appeal to the mathematical mind. It read:

> "Dear Sir:
>
> I have been requested to write a letter in connection with the application of Mr. X for membership in our Club. This is the letter."

An official of our Society has suggested that as an interested observer of the trends of disability insurance in this country, I should prepare a paper discussing the views of Mr. Farley on non-cancellable health insurance as presented at the November meeting. This is the paper!

You will realize, however, that the implications to be drawn from the two comments are entirely different, for whereas Mr. X was not listed among the elect, Mr. Farley, by his paper, has automatically enrolled himself among the select few who have an understanding of present problems and so may attain ultimate knowledge of how the business can successfully be handled.

Mr. Farley's paper, so thoughtfully prepared and so well expressed, to my mind opens all the nooks and crannies of all the problems affecting non-cancellable disability insurance, so that every corner is illuminated by the light of such experience as has been accumulated to date. Those who have read his paper with care, and then re-read it, as we have, will understand both our reluctance to *discuss* it, when the implications of experience as he clarifies it leave so little about which one could argue, and

our desire to *comment* on it, in acknowledment of the obvious intelligence with which he appraises non-cancellable disability insurance and the thoroughness which he brings into the light every facet of the problem, thus serving to guide, and to warn, others who have adventured into the business, out over previously uncharted seas. Those who warn of shoals and quicksands, and indicate the channels through which one can hereafter safely sail, definitely contribute to progress.

If it be understood that I am commenting for sake of emphasis, rather than discussing for purposes of argument, I will touch briefly on two points embodied in substance in Mr. Farley's paper.

The first is that an extremely valuable service to which the public is entitled, namely, that which can be granted by non-cancellable disability insurance, has, as illustrated by the unhappy experience of practically all the life insurance companies in dealing with life indemnity, been hampered or even endangered by the unwillingness of those insured (and the courts) to differentiate between actual physical disability and a desire to live without working. Low limits of indemnity, through careful underwriting, may help, though they may offset in part only the low standards of character many persons betray in their dealings with insurance companies. I venture the suggestion that if the total disability benefits granted by all the life insurance companies had been limited to the original waiver of premium, and not broadened to include the payment to the insured of cash indemnities, we would never have heard of "Class III."

All my observation leads to the belief that, to deal satisfactorily with non-cancellable health insurance, some form of "stop-loss" provision should be used to control those who endeavor to substitute an impairment of the will to work for actual physical disability, and that the business can be profitably and permanently conducted, at proper rates, if that one point can be kept under reasonable control.

Another subject which can well be mentioned to illustrate how the mind of the actuary can be used to illuminate the necessity of care in dealing with a lay function, is that of making anticipatory settlements of long term indemnity claims. Claim reserves may be figured from individual claims, but they are not so much an attribute of any single claim, or an illustration of what amount

may be needed to meet it, as a reflection of the sums needed on the average to meet a group of similar claims. Just as in dealing with human lives, some die sooner and some live longer than could in either event be reasonably expected, so in dealing with claims, some will naturally terminate, often by recovery, sometimes by death, earlier than might well be anticipated. To withdraw from a disabled life experience the better lives (those most apt to recover and therefore those most apt to accept anticipatory settlements) may not alter by a penny the claim reserve which will actually be needed to meet ultimate liabilities on the group, even though the anticipatory settlements are made for less than the reserves on the individual cases thus handled.

The light thrown by Mr. Farley's comments on these and all the problems which affect the underwriting and administration of non-cancellable disability insurance, should serve to guide all who seek to extend to the public the service which insurance of this type can grant, when soundly devised and administered; and we will be fortunate if from time to time future experience can be as clearly interpreted, as an aid to the safe conduct of the business.

MR. WARD VAN B. HART:

Mr. Farley's paper will appeal to two groups; the students who are seeking educational material will find it a veritable textbook on non-cancellable insurance, while those of us who had close connection with that line from 1915-1930 will find it a stimulating analysis whenever we happen to be trying to sharpen our wits on the vexatious problem of how to meet with safety the public's need for health insurance.

Whether we arrive at the same conclusions as Mr. Farley or not, it can do none of us any harm to re-examine any convictions we may have that the history of non-cancellable insurance became practically a closed book ten or more years ago. Is it possible that the absence of the cancellation privilege has been unjustly held responsible for the unfortunate results of non-cancellable in the 1920's and that the real culprit was perhaps the lifetime indemnity benefit?

The company with which I am connected issued non-cancellable as early as 1915. (It was then issued only with life insurance,

but legally and actually was a separate contract, and, in fact, several of our policyholders have taken advantage of their legal right to drop the life insurance and continue the disability income coverage.) In 1920 we commenced issuing it with a two weeks waiting period without life insurance, and in 1921 and 1922 our program was broadened to include a much wider choice of waiting periods. As far as my memory serves me, I can recall during those days considerable fear of the potential loss from "repeaters"; the "vacation hazard" was one of the underwriter's worries, and borderline cases were at times granted a policy with a three months waiting period instead of one with a two weeks waiting period at a considerably higher premium. Relatively, if not absolutely, we would have made money by accepting the more liberal coverage. The presence of a lifetime indemnity benefit in the policies did not cause any of us much loss of sleep. After all, many life insurance companies had been issuing total and permanent disability benefits for ten years or more, and a few of them for fifteen or even twenty-five years. The contract between the actual history of non-cancellable and the way some of us viewed it then would be amusing if it had not been so expensive.

During more or less the same period, while non-cancellable insurance was expanding in volume, we and other accident and health companies were also issuing lifetime indemnity with our cancellable health policies. The experience on these also ran into losses of perceptible magnitude, a situation which many companies proceeded to correct during the later 20's and early 30's by cancelling those policies with the lifetime indemnity feature.

Some of us were remarking semi-facetiously a few weeks ago that the ideal way to word a non-cancellable policy would be to limit the prohibition against the company's cancelling a policy to the situation where the company at the same time cancelled all policies of a given class. Theoretically, if such a policy could be written, the company could terminate a period of unfavorable experience at will, but the policyholder would likewise be protected against cancellation of his individual policy because of conditions peculiar to him and could not say, as he sometimes does, particularly regarding cancellable health insurance, "If you ever have a claim, the company proceeds to cancel your policy on you."

Seriously, however, the above remarks really bring to light the true distinction between non-cancellable and cancellable coverages. Although under the cancellable coverage the company occasionally can take steps to improve its experience by weeding out the poorest risks while the non-cancellable company still has to keep them on the books, that situation probably accounted for the less important portion of the financial loss which non-cancellable insurance exhibited several years ago. The essential distinction between the two coverages was that we were in a position to get rid of our exposures under one type overnight when we finally made up our minds to do it, while we still have the exposures with us of the other type.

Two characteristics of group insurance may serve to clarify our thinking in this respect:

1. Group insurance is usually written with a "formula," employees of a given concern being eligible only according to some fixed and predetermined rule. The factor of adverse selection, which is perhaps the greatest single stumbling block in health insurance, is thus practically eliminated.

2. The company has the right to readjust rates at periodic intervals.

The individual is protected against cancellation of his own coverage provided the entire group is kept in force, and the company (if we regard the privilege of imposing a prohibitively high rate as being practically equivalent to cancellation) is protected against the entire case continuing to be unprofitable. As we all know, group insurance has enjoyed a very marked degree of success.

The history of any line of insurance is likely to be a series of compromises between what coverage the carrier can soundly give and what coverage the economic life of the policyholder demands. Mr. Farley seems to make, if anything, a little too good a case for the adequacy of the policy with 100 months or 10 years limit. After all, while we may admit fairly that legitimate lifetime claims may be relatively rare, is it not exactly the rare event of a crushing and catastrophic nature which is the real danger against which most individuals wish to insure? Instead of claiming that present day non-cancellable insurance is adequate, would it not be sounder thinking to say that life indemnity would be

closer to the ideal economic coverage but is one which the company regretfully has to ask to be excused from granting?

In the last few years of disability income benefits incorporated in life insurance policies, several companies revised their clauses in connection with endowments maturing at ages 55, 60, 65, or 70 so that in event of disability the insured would receive an income only until maturity and at maturity the disability income ceased and the insured then picked up an annuity purchased by the matured value of his endowment. It is a pity that this direct attempt at avoiding the paying of superannuation benefits under the guise of disability was not tried earlier. While the scheme was particularly adaptable to disability benefits included in endowment policies, the same thought could have been carried over into other policy forms and even into the drafting of non-cancellable contracts.

As Mr. Farley points out on Page 23, fear of the superannuation motive is one of the underwriting reasons for the absence of the life indemnity in present day non-cancellable insurance, although not the only reason. It is interesting to speculate whether the criticism of not meeting the true economic need could be answered more gracefully if, instead of imposing a straight 8 or 10 year limit, the companies imposed a limit equal to the unexpired period from the date of disability to the time when normal retirement because of old age would occur. The imposition, as is quite prevalent today, of a limit of an arbitrary number of years may be regarded as a crude method of accomplishing what could be done in a more elaborate fashion.

Mr. Farley barely makes any specific mention of the use of an aggregate limit on all indemnities as distinguished from a limit placed only on any one accident or sickness. Apparently non-cancellable insurance issued with an aggregate limit is the prevailing type today.

Fundamentally, of course, either method is a means to an end, namely, to stop somewhere short of the payment of complete lifetime indemnity. The use of an aggregate indemnity limit introduces the concept that with each claim the contractual relation between the company and the insured is altered. Upon recovery, the policyholder finds himself, in effect, with a different contract than he had prior to the inception of the claim. A strictly

logical mathematical development for premiums and reserves as they are built up in Mr. Farley's paper is not entirely possible under such a type of contract. For instance, the net one year Term premium, which in one form or another forms the raw material of the net level premium, cannot be a function merely of attained age but will depend on the duration of the policy and the consequent portion of the aggregate limit which, in theory, has already been used up. Given sufficient volume of reliable experience exposed on the aggregate limit basis, sickness tables could be built up for each age at entry, provided that they were only to be used in calculations for policies to be issued in the future with the same aggregate limit as was used in the actual experience. This would be equivalent to using the assumption that disability occurring beyond the limit never actually occurred at all and would be one possible line of attack on a mathematical treatment of the problem.

A rough check of investigations into premiums and reserves for an aggregate limit policy could be made by assuming that a policy with m months' aggregate limit was equivalent on the average to a policy with n months' limit on each separate claim but with no limit in the aggregate. Obviously $n<m$ and n must bear some logical relation to m which may be approximated by judgment. An interesting point to explore is whether the active life reserve on any individual life should be adjusted by the portion of the aggregate limit actually used up in past claims or merely by the portion which should in theory have been used up on the group as a whole.

Another way to view the use of the aggregate limit, although one which is incapable of being translated into mathematical terms, is that it is a compromise between cancellable and non-cancellable insurance. Under cancellable insurance the company, after each claim, reviews the situation and cancels or modifies the insurance on some policyholders, leaving the policies of other claimants unchanged. Under the aggregate limit basis, with each claim there is an automatic reduction in the liberality of the future coverage irrespective of any individual consideration given to the particular claimant.

Mr. Farley stresses the importance of giving every attention to sound underwriting and, in particular, to the matter of moral

hazard. One may agree most heartily with this without necessarily endorsing a point of view which Mr. Farley, perhaps unintentionally, assumes, namely, that the importance of sound underwriting and of watching the moral hazard is peculiar to non-cancellable insurance, or, in particular, non-cancellable insurance as it has been administered in the past ten years. After all, no line of insurance is immune from the dangers of lax underwriting and insistence on elimination of the moral hazard is a prerequisite in the handling of any line. Although probably plenty of mistakes were made in underwriting the non-cancellable lifetime indemnity contracts of the 20's, even those contracts were underwritten by and under the direction of trained underwriters and yet the experience was unfavorable. The difference between the underwriting standards of that period and those of today, possibly, should be emphasized as one of degree rather than one of kind. As mentioned in connection with group insurance, the elimination of adverse selection is an important factor in any form of health insurance, and one of the reasons for the necessity of underwriting at all is to set up methods to combat this danger. It remains to be seen whether under non-cancellable insurance as written today this and other problems have been satisfactorily solved.

With regard to some of the specific underwriting points mentioned, we are, however, in complete agreement, in particular, the necessity of watching the amount of insurance granted, both in relation to the income of the applicant and in absolute dollars and cents. Many of us have seen claims where the original underwriting had restricted the amount of income granted to what seemed a reasonable amount at the time, and yet the claimant, by investing a small amount in a trailer or by renting a very modest cottage in Florida, was apparently able to live for the rest of his life in what actually turned out to be a modest degree of luxury by a readjustment of his standards.

If revised standards of underwriting are able to eliminate situations of that type, we feel it should be emphasized that the results will have been achieved as much by the change in the type of contract offered as by the ability of the companies to accomplish the results merely through changes in underwriting standards.

If time were available for a discussion of Mr. Farley's treatment of claim administration, legal considerations, mathematical and accounting practice, many interesting points could be explored. It has seemed to me preferable, however, to confine this discussion to bringing out some of the underlying philosophy of non-cancellable insurance.

While non-cancellable insurance furnishes protection both against disability resulting from accident and that resulting from disease, the health insurance aspect of non-cancellable insurance is the one which presents the most numerous problems. Today Accident policies sold on a cancellable basis generally furnish broader coverage and probably do a very good job of furnishing protection against loss due to accidental injuries. The cancellation feature is of relatively less importance than under health insurance and does not seem to be objectionable to the public. If it develops that the non-cancellable policies being sold today can be profitably underwritten by the companies, they will serve to some extent to meet the needs of the public for more complete health insurance. I have to conclude, however, as Mr. Farley does, that only time holds the answer.

MR. K. B. PIPER:

Mr. Farley has given us a scholarly picture of an important and intricate subject. This is one field where practical approximations are valuable to reduce the labor of calculation and are justified by the fact that morbidity rates vary widely with economic changes, underwriting practices and other factors. We may be especially grateful that the author has taken the trouble to cite alternative formulas and show how they differ.

Mr. Farley's emphasis on a gross premium valuation is especially timely. Net premium reserves have a deceptive appearance of accuracy. Because they are readily defined and may then be calculated without requiring more use of judgment than is necessary to choose an economical working formula, they are convenient and practical as a guide to the supervising authorities as well as for the ordinary use of management.

But the facts lie deeper. Actuaries in the life field have long

recognized the need for the gross premium method of valuation in considering reinsurance of a block of business. The experience with reinsurance of insolvent life companies indicates that conditions in the past have been such as to make the usual net premium valuation of life insurance somewhat redundant, because the interest and mortality assumptions were conservative.

Under present conditions of low interest return and particularly if there should be a long-term trend toward higher living costs, we might find it desirable to strengthen net premium reserves in the light of a realistic gross premium valuation or an equivalent study of asset shares. As Mr. Farley points out, the obligation to meet future expenses is just as binding as the liability to pay future claims. In fact a company cannot provide the benefits promised in its contracts unless it can meet the expenses incurred in the process.

MR. JOHN M. POWELL:

Mr. Farley is to be highly congratulated upon his paper on the subject of non-cancellable disability insurance. It is exceptionally complete and there is very little with which one can take any great exception.

He places great stress, and rightly so, upon the factor of moral hazard. Except for that factor, the writing of non-can disability insurance would offer few difficulties.

My own valuation of the moral hazard would be fully as high —and possibly higher—than Mr. Farley has brought out, although his strong position has been indicated in many places throughout the paper. One of the strongest is his reference under the subheading "Adequacy of Limited Non-can Policies." He brings out that the Conference modification table shows about two-thirds of all disability occurs within two years, and one-third beyond the end of two years. He goes on, however, to say, "If it were possible to get a table which expressed true physical and mental disability, eliminating all malingering and superannuation, it would show that there is only a very small proportion of true total disability which cannot be covered by the policies available." It is quite obvious, therefore, that the author considers that a substantial portion of the disability beyond two years is due to the effect of moral hazard; how much, of course, it is impossible

to measure. Some interesting observations may, however, be reached by reference to the Combined Health Experience covering a period of five years prepared by the Committee of Five on Statistics of the Bureau of Personal Accident and Health Underwriters.

According to that experience, of 118,323 persons disabled, 579, or only .49%, were still disabled at the end of the year. Among that group of 118,323, there was experienced a total number of 2,484,678 disabled days, or a total of 4,291 days or 12 years of sickness for each of the 579 remaining disabled persons. As the Class (3) select life annuity value at the end of the first year of disability is equal to approximately six years of indemnity, this would indicate almost exactly one-third of the total morbidity as occurring beyond one year, instead of beyond two years. Further, as no doubt life indemnity would contain a greater percentage of border-line disability than would the first year's experience indicated above, where in the main the policies upon which the Bureau experience was based were limited to one year, the conclusion could easily be reached that far less than one-third of the total true morbidity was experienced beyond the end of one year.

The author brings out the different effects of moral hazard upon short-term policies, medium-term policies and those paying life indemnity. I agree in general with his observations although I believe it is possible that this factor may be substantially more serious on medium-term policies than his statements would indicate. There is a general feeling that at some indefinite time in the future, following completion of our Defense Program, a serious business reaction is likely to be experienced. If we should have a group of—let us say—ten policyholders who would give up an unprofitable business for what appeared to be a chance to obtain life indemnity, how many of that group would refuse to give up that business for an assured income that would in all probability carry them beyond the depression? Or if that group of policyholders were nearing retirement age and as border-line cases would claim indemnity on a life annuity basis, how many of them would refuse to claim indemnity where it was limited to—let us say—five to ten years? There would in each case be some difference, of course, but the difference may not be as great as might be assumed. That Mr. Farley has given consideration to such possi-

bilities is brought out in his comments under the heading "Effect of the Limit on the Moral Hazard."

Under the heading "Underwriting the Moral Hazard," he has covered this subject splendidly. A new factor, however, is developing which should make an underwriter somewhat more conservative on the larger incomes, that is, the matter of substantially heavier income taxes. If a top limit of $500 indemnity per month is rigidly adhered to, a 75% of established steady income may not be dangerous although it does seem very high. The granting of $500 per month, or $6000 per year on an $8000 income would, with the heavy income tax in prospect, leave a very small margin of safety. This income could easily shrink to five or six thousand dollars per year or even lower. As there would still be a substantial tax, this safety margin of 25% becomes very low. With incomes and indemnities above those amounts, a wide margin of safety between earned income and amount of indemnity becomes increasingly important very rapidly. In the company with which I am connected, we have followed, with few exceptions, a limitation for indemnity carried in all companies, decreasing from 80% for incomes of $250 per month or less down to 50% where the incomes are in excess of $750 per month. Except in very unusual circumstances, the top limit of $500 has been followed.

The author discusses the question of non-forfeiture values and rightly concludes that they have no place in this type of insurance. The maximum value that can ever be justified on any insurance policy is the true prospective reserve less the cost of securing a new policyholder of equal value. These true prospective reserves, even for policies issued at the same age and having the same duration, will have an extremely wide variation, but with a large group of policyholders, their sum would be equal in the aggregate to the sum of their individual tabular reserves. Each one (on a net premium valuation basis) would consist of the present value of future prospective claims, giving effect to the physical conditions and the other factors pertaining to the individual that tend to affect claims less the present value of future premiums. These values would vary from one extreme on poor risks where the true reserve would be many times the tabular reserve to the opposite extreme on the best risks where there

would actually be a negative reserve. If it were feasible to construct such true reserves, it would be feasible to allow a cash value on those policies in the worst category, but there would be no value for the policies in the favorable category. As there is little likelihood of a policyholder in the unfavorable group permitting his policy to lapse, particularly where there is a grace period, it would follow that there are extremely few cases where injustice is done due to there being no non-forfeiture values.

In conclusion, the student of non-cancellable disability insurance should find this paper exceedingly valuable. The author has used language which conveys very clearly the ideas which he has set out to express. He has dealt not only with the theoretical aspects of the various problems, but has discussed also numerous practical factors which should be very helpful not only to the student but also will give a new and interesting viewpoint on many matters to the experienced accident and health official whether interested in non-cancellable or cancellable business.

AUTHOR'S REVIEW OF DISCUSSIONS

MR. JARVIS FARLEY:

To those who participated in the discussion the author extends sincere thanks for the generosity of their comments and for their contributions in emphasizing and expanding a number of important points. Beyond that, there is little to say in review of the fine discussions. It is interesting that two of the written discussions were submitted by men who were directly concerned with the last paper before this Society on the subject of non-can underwriting problems—Mr. Laird's paper presented exactly twenty years ago. Mr. Johnson contributed to the discussion at that time, and Mr. Hart was in close daily association with Mr. Laird. Mr. Powell, too, has been active in this field almost since its inception.

To me, the most striking feature of the written discussions is the emphasis which they lay upon the moral hazard in connection with non-can underwriting. In the opinion of those now active in the non-can field, no other field presents a moral hazard so subtle and so pervasive. As Mr. Miller said, "There is perhaps

no other line of insurance in which the character and good faith of the insured is more important." It is true, as Mr. Hart said, that "no line of insurance is immune from the dangers of lax underwriting and insistence on elimination of the moral hazard is a prerequisite in the handling of any line." In the field of non-can, however, the moral hazard is immeasurably greater than in most fields and, accordingly, less easily eliminated. The standards of underwriting must be correspondingly higher and more diligently applied. The fundamental principle applies to all lines, but in different degree, and I believe that it is very difficult for a person schooled in the underwriting of regular life or casualty insurance lines to appreciate or even to conceive of the extreme degree with which the principle applies to non-can underwriting. Such an underwriter might believe that he was applying rigid standards to non-can risks when in fact his standards were not sufficiently high, or his application thereof was not adequately searching. For this reason, among others, I believe that non-cancellable disability insurance will in practice be developed most successfully by companies devoting their major attention to that field, rather than by companies who might write it as a sideline. This accords with Mr. Miller's statement that "the distinctions between non-can and life or any other form of insurance seem to require a special organization, both in the office and in the field, for its successful conduct."

I would be less than fair if I accepted for my own the kind comments of the discussions without giving the credit where it is really due—to those actuaries of other companies who, by their frequent advice and assistance, have helped me to organize what actuarial education I may have accomplished, and to the executives of my own company, who have patiently and completely shared with me their knowledge and experience in this field of non-cancellable disability insurance.

EXCESS COVERAGE (PER ACCIDENT BASIS) FOR SELF-INSURERS: WORKMEN'S COMPENSATION—NEW YORK

JAMES M. CAHILL

VOL. XXVII, PAGE 77

WRITTEN DISCUSSION

MR. H. G. CRANE:

As stated in Mr. Cahill's paper, the proposed formula for computing rates for New York for excess coverage over a $10,000 per accident limit is as follows:

$$\text{Excess Rate} = \frac{\frac{\text{Ser. P. P.*}}{\text{Total P. P.}} \times \frac{\text{Excess Cost**}}{\text{Ser. Cost}} \times .598 \times \left(1.000 + \frac{.080 + .020 + .103}{.598}\right) + .010}{(1.000 - (.150 + .039)} \times \text{Manual Rate}$$

$$= \left(\frac{\text{Ser. P. P.*}}{\text{Total P. P.}} \times \frac{\text{Excess Cost**}}{\text{Ser. Cost}} \times .9873 + .0123\right) \times \text{Manual Rate}$$

* For Class.
** For Hazard Group.

This formula can be restated:

$$\text{Excess Rate} = \frac{\frac{\text{Ser. P. P.*}}{\text{Total P. P.}} \times \frac{\text{Excess Cost**}}{\text{Ser. Cost}} \times .598 \times \text{Manual Rate*}}{.6057} + .0123 \times \text{Manual Rate*}$$

In this form the expression $\left(\frac{\text{Ser. P. P.*}}{\text{Total P. P.}} \times \frac{\text{Excess Cost**}}{\text{Ser. Cost}} \times .598 \times \text{Manual Rate*}\right)$ may be considered the excess pure premium and the formula can then be written thus:

$$\text{Excess Rate} = \frac{\text{Excess Pure Premium*}}{.6057} + .0123 \times \text{Manual Rate*}$$

Now I believe it is approximately correct to say that .598 of the manual rate for a given class equals the class pure premium. (It would not be true to the extent that the $.01 catastrophe loading and the occupational disease loading of between $.01 and $.05 have not been removed from the manual rate before applying the factor of .598, but this inaccuracy should be relatively unimportant.) Hence the following should be approximately correct:

$$\text{Excess Pure Premium} = \frac{\text{Ser. P. P.*}}{\text{Total P. P.}} \times \frac{\text{Excess Cost**}}{\text{Ser. Cost}} \times \text{Total P. P.*}$$

$$= \text{Ser. P. P.*} \times \frac{\text{Excess Cost**}}{\text{Ser. Cost}}$$

The propriety of this method of determining excess pure premiums is open to question in two respects. First, there may be some question as to whether the ratio of excess cost to serious cost which has been determined from full coverage experience is representative of the corresponding ratio which would be shown by self-insurers' experience, if an adequate volume of the latter could be compiled. However, I am inclined to believe that this possibility can be ignored. The second question is as to whether this ratio of excess to serious cost can be appropriately applied to the full coverage serious pure premiums in order to produce excess pure premiums. I believe this is extremely doubtful. It is common knowledge that loss experience is much more favorable on large insured risks than on small ones.* Self insurers are almost invariably large risks and it is reasonable to expect that the experience of a self insurer of a given size would be at least as favorable as that of an insured risk of equal size. Accordingly it would seem that the class serious pure premiums used in deriving excess pure premiums ought to be considerably lower than the class average. Perhaps this could be taken care of by the introduction into the formula for computing excess rates of a factor to allow for the better than average experience to be expected on self insured risks by reason of size of risk.

The expense loading provision in the formula proposed by the New York Board seems to me to be extravagant. I have worked out the excess pure premiums for the fifteen classifications for which the proposed excess rates over a $10,000 per accident limit are shown in Mr. Cahill's Exhibit 11. The proposed expense loading varies by classification because it is based in part on the excess pure premium and in part on the full cover manual rate. For these fifteen classifications the loading ranges between 45.8% and 51.8%. Thus the ratio of proposed excess rates to proposed excess pure premiums ranges between 1.845 and 2.075. This is in contrast to an expense loading in the full coverage rates of 40.2%, equivalent to a ratio of rate to pure premium of 1.672. For the reinsurance companies which are providing excess cover-

* In this connection see paper by Mr. Charles J. Haugh entitled "Recent Developments with Respect to the Distribution of Workmen's Compensation Insurance Costs," *Proceedings,* Volume XIV, page 262, and paper by Mr. Mark Kormes, "Small Risks versus Large Risks in Workmen's Compensation Insurance," Volume XXIII, page 46.

age to self insurers an expense loading of 35% is certainly ample. This requires a factor of only 1.538 to mark up the pure premium to the rate.

The difference between the expense loading proposed for excess rates and that included in the rates for full coverage is due entirely to the fact that part of the proposed expense loading is derived as a percentage of the full cover manual rate. Mr. Cahill does not explain the reason for this procedure other than to say that it is provided for "fixed company administration and payroll audit expenses." The rates for full coverage insurance contain a percentage allowance for home office administration and payroll audit expenses which applies uniformly to every premium dollar regardless of manual classification or size of risk, except to the extent that in addition a small expense constant is imposed on policies where the premium is less than $500. It is difficult to see why the rates for excess coverage should be more heavily loaded. In fact the expense loading should be lower for excess coverage than for full coverage. The 2.0% loading for Department of Labor assessments should not be included because self insurers are assessed directly by the Department of Labor, and excess carriers are not so assessed. It is doubtful whether the 1.0% provided in taxes for the Security Fund tax should be included. The Security Funds are not for the benefit of self insurers or employees of self insurers and the law levies the tax only against premiums written for policies which insure payment of compensation pursuant to the Workmen's Compensation law. Furthermore there is virtually no claim expense attached to this form of insurance. The self insurer has its own claim organization and is responsible for the investigation and settlement of all claims. The excess carrier has the right to participate in the negotiations for settlement or defense of any suit, but in practice this right is seldom exercised. Inspection expense is another item which exists only to a limited extent in handling excess insurance. Inasmuch as self insurers ordinarily have adequate safety organizations excess carriers do not make inspections except in the case of the occasional extra-hazardous risk.

Preliminary to outlining the proposed rate making method, Mr. Cahill alludes to the actual excess coverage experience for policy years 1928-1937. This experience, which he presents in

his Exhibits 1 and 2, shows that the loss ratio was 35.7% for Board members and 91.5% for non-member reinsurance carriers, or a combined loss ratio of 70.8% on a total premium volume of $670,097. The author states that this was a very adverse loss ratio considering that the permissible loss ratio would average less than 50%. It should be noted, however, that the non-member reinsurance carriers could have well afforded a permissible loss ratio as high as 65%. Furthermore, it is unfortunate that Mr. Cahill did not bring out the fact that had the experience on a single large risk with very adverse results been excluded, the picture would have been entirely different with a loss ratio of only 36.7% for the non-member reinsurance carriers and only 36.3% for all carriers combined. The effect on the experience of the results on this single risk is shown below:

ACTUAL EXPERIENCE FOR POLICY YEARS 1928-1937

BOARD MEMBERS

	Earned Premium (1)	Incurred Losses (2)	Loss Ratio (3)
As shown in Mr. Cahill's Exhibit 1	$248,633	$88,839	35.7%
Result attributable to a single risk	..	..	..
Result adjusted to exclude above risk	$248,633	$88,839	35.7%

NON-MEMBER REINSURANCE CARRIERS

	Earned Premium (4)	Incurred Losses (5)	Loss Ratio (6)
As shown in Mr. Cahill's Exhibit 1	$421,464	$385,770	91.5%
Result attributable to a single risk	111,364	271,847	
Result adjusted to exclude above risk	$310,100	$113,923	36.7%

ALL CARRIERS

	Earned Premium (7)	Incurred Losses (8)	Loss Ratio (9)
As shown in Mr. Cahill's Exhibit 1	$670,097	$474,609	70.8%
Result attributable to a single risk	111,364	271,847	
Result adjusted to exclude above risk	$558,733	$202,762	36.3%

There is considerable justification for excluding this risk from the experience for the reason that it covered a large construction project written on virtually a non-cancellable basis and therefore on a form of coverage materially different from that contemplated by the proposed rates.

Exhibit 11 of Mr. Cahill's paper presents a comparison of the proposed rates with the rates actually charged on risks covered on an excess basis in policy year 1937. The proposed rates in most instances are substantially higher than those actually charged, but Mr. Cahill states that the actual premiums do not serve as a good basis for comparison because over a period of years the actual premium charges have been grossly inadequate. As indicated above, the ten year actual experience excluding one risk was not at all unfavorable. Furthermore, the comparison of the actual with the proposed rates is rather misleading in certain respects. Excess coverage is frequently written for self insurers with operations in several states at a rate applying to the entire operations rather than at separate rates for each state. In such cases a rate which may be adequate for the risk as a whole will appear low for the New York operations by themselves because of the fact that the New York Compensation Act is more liberal than that of other states. Moreover the rates now being charged to self-insurers for excess coverage in most cases apply to the entire payroll of the self insurer regardless of manual classification, with the result that clerical office and similar employees take the same rate as do employees in the governing classifications, whereas the proposed rates contemplate payroll segregation in accordance with the manual rules. This point is not recognized in Mr. Cahill's Exhibit 11.

Thus there are several reasons why the present rates are not nearly as susceptible of criticism from the standpoint of adequacy as would be indicated by Mr. Cahill's paper while the proposed rates appear too high with respect both to the pure premium basis and the expense loading. In fixing rates for excess coverage the carriers have nothing to gain by establishing a scale of rates which is too high. Such rates do not discourage self insurance, but merely provide an incentive for securing excess coverage from unlicensed insurers.

EXHIBIT SHOWING EXCESS PURE PREMIUMS AND EXPENSE PROVISION IN PROPOSED RATES FOR COVERAGE IN EXCESS OF $10,000 PER ACCIDENT FOR CLASSIFICATIONS FOR WHICH DATA SHOWN IN MR. CAHILL'S EXHIBIT II.

Manual Code No.	Proposed Excess Cover Rate (a)	Full Cover Manual Rate	Ratio (1) ÷ (2) (c)	Proposed Excess Cover Pure Premium [(3) − .0123]x.598x(2) .9873	EXPENSE PROVISION IN PROPOSED EXCESS COVER RATES							% Expense Loading Included In Proposed Excess Cover Rate (11) ÷ (1)
					Acquisition (1)x.150	Taxes (1)x.039	Dept. of Labor Assessment .020 / .598 x(4)	Adjustment .080 / .598 x(4)	Fixed Company Administration and Payroll Audit .010x(2)	Inspection and Remaining Company Administration .103 / .598 x(4)	Total Provision For Expenses (5)+(6)+(7)+(8)+(9)+(10)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1421	$.630	$6.56	.096	$.333	$.094	$.024	$.011	$.045	$.066	$.057	$.297	47.1%
1463	.352	4.75	.074	.177	.053	.014	.006	.024	.047	.031	.175	49.7
1624	1.112	9.93	.112	.600	.167	.043	.020	.080	.099	.103	.512	46.0
1701	.212	2.62	.081	.109	.031	.008	.004	.015	.026	.019	.103	48.6
2095	.170	2.83	.060	.082	.025	.007	.003	.011	.028	.014	.088	51.8
3883	.321	4.79	.067	.159	.048	.013	.005	.021	.048	.027	.162	50.5
4000	.949	8.87	.107	.509	.142	.037	.017	.068	.089	.087	.440	46.4
4511	.091	.95	.096	.048	.014	.004	.002	.006	.009	.008	.043	47.3
4527	.152	1.65	.092	.079	.023	.006	.003	.011	.016	.014	.073	48.0
4683	.395	4.25	.093	.208	.059	.015	.007	.028	.042	.036	.187	47.3
4720	.204	2.87	.071	.102	.031	.008	.003	.014	.029	.017	.102	50.0
6260	2.249	19.39(b)	.116	1.218	.337	.088	.040	.163	.194	.209	1.031	45.8
7309	.750	12.29	.061	.363	.112	.029	.012	.049	.123	.062	.387	51.6
8742	.041	.47	.087	.021	.006	.001	.001	.003	.005	.004	.020	48.8
8810	.008	.10	.075(c)	.004	.001	....	....	.001	.001	.001	.004	50.0

(a) As shown in Column (7) Mr. Cahill's Exhibit II.
(b) This classification (a) rated; amount shown obtained by dividing proposed excess rate by percentage shown in Column (7), Mr. Cahill's Exhibit II.
(c) Equivalent to percentages shown in Column (7), Mr. Cahill's Exhibit II.

MR. MARK KORMES:

I

On previous occasions I have written discussions of several papers and I must confess that each time I had to be prompted out of my inertia by a more or less urgent request of the then vice-president. The subject of this paper, however, was always of great interest to me and the study of excess cost was undertaken by the Compensation Insurance Rating Board only after a considerable prodding on my part of the members of the Actuarial Committee to whom it presented merely an academic problem.

In view of the decision of Superintendent Conway* I felt all along that eventually stricter supervision and perhaps mandatory rates would replace the rather chaotic and highly competitive methods used in the underwriting of this form of coverage. The average excess rate being close to 9% of the manual rate and the Self-Insurers accounting for approximately one-fifth of the state's exposure, I saw the possibilities of an annual premium volume from one to two million dollars. The disparity between the rates actually charged and the advisory rate was considerable and the experience underlying such advisory rates ancient so that I felt that a thorough study was warranted. I have, therefore, kept this matter continuously before the Actuarial Committee of the Board and finally succeeded in getting its approval to go full steam ahead. Alas, I was not fortunate enough to stay with this work to its conclusion and so it became my successor's privilege to present to the Society a paper on this subject. I enjoyed therefore reading the paper and digesting its contents and it is with zest and relish that I am preparing this discussion.

II

It will not be amiss to begin with some aspects of historical nature which will have a bearing on certain elements of the discussion. The advisory rates published in 1931 were calculated on the basis of experience of policy years 1922 and 1923. The excess cost was not computed on the basis of deferred annuities

* See Mr. Cahill's paper.

but the amount of retention ($10,000) was deducted from the total incurred cost (indemnity and medical combined) on cases where such cost exceeded $10,000. This produced the following results:

TABLE I

Hazard Group	Ratio of Excess to Serious		
	Single Cases	Catastrophes	Combined
1. High	.075	.085	.160
2. Medium	.079	.026	.105
3. Low	.053	.005	.058
Total	.062	.014	.076

Based on the study of the effect of using deferred annuities conducted by one company member of the Committee* it was found that a multiplier of 2.0 should be applied to the excess cost of single cases. No adjustment was made in the excess cost of catastrophes. This action is somewhat justifiable by the fact that in cases of catastrophes the amount of retention will be quickly exhausted and that therefore over a short period the value of temporary annuities will not differ greatly from the sum of annual payments.

III

Another element which was covered rather briefly in the paper is the method used in the calculation of excess costs on a deferred annuity basis. The formulae are rather elementary to a seasoned actuary but the student who seeks enlightenment or who prepares for the examinations will appreciate the following remarks.

In connection with the evaluation of permanent total disabilities (or permanent partial disabilities awarded life benefits) the formula used for calculation of deferred annuities was:

$$ {}_n|\bar{a}_x = \frac{\overline{N}_{x+n}}{D_x} \qquad (1) $$

The bar over the annuity symbol indicates the fact that continuous annuities are being used and it only remains necessary to explain the meaning of the symbol $\overline{N}_x$.

The value of a continuous annuity is given by:

$$ \bar{a}_x = a_x + \tfrac{1}{2} \qquad (2) $$

* Aetna Life Insurance Company.

If we substitute for a_x the usual commutation symbols we obtain:

$$\bar{a}_x = \frac{N_{x+1}}{D_x} + \tfrac{1}{2} = \frac{N_{x+1} + \tfrac{1}{2}D_x}{D_x} \tag{3}$$

or:

$$\bar{a}_x = \frac{\bar{N}_x}{D_x} \tag{4}$$

where:

$$\bar{N}_x = N_{x+1} + \tfrac{1}{2}D_x \tag{5}$$

The transition from formula (4) to formula (1) does not present any difficulties.*

As respects the valuation of death cases, it was quickly recognized that an attempt to make exact calculation of deferred annuities would introduce considerable amount of clerical labor. For this reason the Actuarial Committee decided to consider the full reserves for children as a part of payments made and to be deducted from the amount of retention. It should be observed that this procedure tends to *reduce* the amount of excess cost. For cases where the attained ages of the children as of the valuation date are advanced, the reduction is small but for cases where the attained ages are low, the reduction is rather substantial as may be seen from the following table:

TABLE II**

Age of Widow	Ages of Children	Present Value of Excess over $10,000		
		As Used in Study	Exact Calculations	Percentage Difference
40	14, 15, 16 & 17	$4,019	$4,046	+ .7%
40	6, 7, 8, 10 & 15	6,903	7,559	+ 9.4
26	1, 2	4,022	5,138	+ 27.7

Whether and to what extent the method used has produced too low excess costs depends on the distribution of both the number of children and their ages as of the valuation date. In any case, the conclusion that the calculated excess cost is rather on the low side seems warranted from the above considerations.

* The writer wishes to call attention to the fact that tables showing the values of $\bar{N}_x$ at 3½% are included in the December 1, 1938, edition of the New York Workmen's Compensation Statistical Plan.

** The values in this table are based on annual wages of $1,800.

These remarks will also serve to illustrate the considerable amount of labor required for the computation of excess costs over three distinct retentions for the 2,323 accidents included in the study.

IV

Let us now compare the results of the study with the data underlying the old advisory rates as shown in Table III below:

TABLE III

Hazard Group	Ratio of Excess (Over $10,000) to Serious Cost)					
	Single Cases		Catastrophes		Combined	
	Old	New	Old	New	Old	New
1. High	.150	.174	.085	.055	.235	.229
2. Medium .	.158	.179	.026	.019	.184	.198
3. Low	.106	.149	.005	.009	.111	.158

The above table brings out an increase in the excess cost of single cases and a decrease in the cost of catastrophes. Whether this reflects the general trend or is merely due to the peculiarity of the experience periods is a question worthy of further research. If my information is correct, the experience period underlying the new rates does not include the famous "Observation" disaster.

This table also serves to emphasize the fact that the hazard groups were selected on the basis of catastrophe hazard. The excess cost of single cases naturally depends on the wages of the injured employee and the ages of the beneficiaries and therefore this cost should not vary substantially by hazard groups.

In general, it may be concluded from the comparison that the results of the study modify only slightly the original values.

V

Having thus touched upon some of the technical phases of the "pure" excess cost, let us turn to the element of expense loading. I am gratified to note that Mr. Cahill and the Actuarial Committee of the Board found it advisable to reduce the expense loading but I do not think that they have bridged the gap between the advisory rates and the rates actually charged. From Exhibit XI of Mr. Cahill's paper one can readily find that the advisory rates

are practically 100% higher than the rates used in actual practice and apparently with moderate success. The application of such rates to the experience shown in Exhibit I of Mr. Cahill's paper would produce for Board members a loss ratio of approximately 18%, for non-member Reinsurance Companies a loss ratio of 46% and over-all a loss ratio of about 36%. This, of course, under the assumption that the ratio of 2 to 1 would hold for the entire experience period. If my recollection does not fail me, the rates charged were on the whole considerably less than 50% of the then advisory rates. Bearing in mind that about 20% of the premiums and about 15% of the losses were incurred under policies with a retention of less than $10,000, it would be difficult to justify rates producing such a substantial margin of profit.

It therefore, deems proper to examine the expense loading formula in detail with the object of ascertaining whether or not it meets the tests of reasonableness and adequacy.

Mr. Cahill presents the expense loading formula in the following form:

$$\text{Excess Rate} = \text{Manual Rate} \times \left(\frac{\text{Serious P.P.*}}{\text{Total P.P.*}} \times \frac{\text{Excess Cost**}}{\text{Serious P.P.**}} \times a + b \right) \quad (6)$$

where a and b are constants. The difference between the old and this proposed method of expense loading lies in the value of these constants, as explained in the paper, viz:

$$\text{Old Advisory rates:} \quad a = \frac{.600}{.80 \times .80} = .9375$$

$$b = \frac{.030}{.80} = .0375$$

$$\text{New Advisory rates:} \quad a = \frac{.598 \times \left(1.000 + \frac{.080 + .020 + .103}{.598} \right)}{1.000 - (.150 + .039)}$$

$$= .9873$$

$$b = \frac{.010}{1.000 - (.150 + .039)} = .0123$$

---

* For a given classification.
** For a hazard group to which the classification belongs.

Equation (6) indicates that the expense loading is a function of two variables, namely, (a) the manual rate and (b) the ratio of the serious cost to the total cost for the given classification. Equation (6) does not disclose readily what is the loss portion and what is the expense portion of the rate and for this reason I have developed below a different form for the expense loading formula which is more familiar in its appearance.

Let

$$\epsilon = \frac{\text{Serious P.P.}}{\text{Total P.P.}} \times \frac{\text{Excess Cost}}{\text{Serious Cost}} \tag{7}$$

It may be readily seen that the excess cost per \$100 of payroll or the "excess pure premium," E is given by

$$E = \epsilon \cdot r \cdot (1 - L) \tag{8}$$

where r is the manual rate and L is the expense loading percentage in rates. To demonstrate equation (8) consider that:

$$\epsilon \cdot r \cdot (1 - L) = \frac{\text{Serious Cost}}{\text{Total Cost}} \cdot \frac{\text{Excess Cost}}{\text{Serious Cost}} \cdot \frac{\text{Total Cost}}{1 - L} \cdot (1 - L)$$
$$= \text{Excess Cost} = E$$

From (8) we find that

$$\epsilon = \frac{E}{r\,(1 - L)} \tag{9}$$

Let ζ represent the *excess rate* and λ the expense loading percentage in such excess rate, we have then:

$$\zeta = \frac{E}{1 - \lambda} \tag{10}$$

Let us now write equation (6) by means of the symbols introduced above. We obtain

$$\zeta = r\,(\epsilon\, a + b) \tag{11}$$

Substituting for ϵ and ζ expressions (9) and 10), we have

$$\frac{E}{1 - \lambda} = r\left(\frac{E\,a}{r\,(1 - L)} + b\right) \tag{12}$$

Solving (12) for λ we obtain:

$$\lambda = 1 - \frac{E\,(1 - L)}{E\,a + r\,b\,(1 - L)} \tag{13}$$

Since in the present rates $1 - L = .598$ the expense loading percentage for excess rates is:

$$\lambda = 1 - \frac{.598\,E}{.9873\,E + .598\,r\,.0123}$$

$$\text{or } \lambda = 1 - \frac{.598\,E}{.9873\,E + .0073554\,r} \tag{14}$$

and the loading factor in excess rates

$$\frac{1}{1-\lambda} = \frac{.9873\,E + .0073554\,r}{.598\,E} \tag{15}$$

The equations (14) and (15) permit us to analyze the expense loading provision in excess rates. It is apparent that the loading is a function of two variables, namely, the excess pure premium, or cost, and the manual rates. For a fixed rate, λ will decrease as E increases and increase as E decreases, or, in other words, the loading percentage is smaller for higher excess cost and greater for lower excess costs. For a fixed excess cost, λ will increase or decrease as the rate increases or decreases.

In a given hazard group it is very likely that two classifications with the same rate have a different serious pure premium. The classification with the lower serious cost and therefore lower excess cost will have a higher expense loading percentage than the classification with the higher excess cost. This is neither easy to justify to the Self-Insurer or supervisory authorities nor is it desirable from the point of view of the carrier.

VI

In this last chapter of my discussion, I would like to sketch a few suggestions relative to the matter of expense loading and underwriting of excess insurance in general.

The argument may be advanced that the expense loading percentage for excess coverage must be higher than that for standard coverage because of certain elements which will cost the same amount of money regardless of whether full or excess coverage is granted. As long as no definite information is available just what is the cost of these elements and judgment has to be employed, it may be necessary to fix for the time being the permissible loss ratio at say 55%.

If this method were to be employed, we would have

$$\epsilon \cdot k \cdot r = \frac{E}{1-\lambda} \tag{16}$$

where k is the factor to be determined.
From (16), and since by (8)

$$E = \epsilon \cdot r\,(1-L)$$

we have

$$\epsilon \cdot k \cdot r = \frac{\epsilon r\,(1-L)}{1-\lambda}$$

and finally

$$k = \frac{1-L}{1-\lambda} \tag{17}$$

Thus if λ is taken at 45% the loading factor $\frac{1}{1-\lambda}$ becomes 1.818 and the formula for calculation of excess rates:

$$\zeta = \text{Manual Rate} \times \left(\frac{\text{Serious P.P.}}{\text{Total P.P.}} \times \frac{\text{Excess Cost}}{\text{Serious Cost}}\right) \times 1.087 \tag{18}$$

Another approach might be the use of the formula:

$$\text{Excess Premium} = \text{Payroll} \times \text{Excess Rate} + \text{Policy Fee} \tag{19}$$

where the excess rate would be obtained from

$$\text{Excess Rate} = \frac{\text{Serious P.P.}}{\text{Total P.P.}} \times \frac{\text{Excess Cost}}{\text{Serious Cost}} \times .9873 \times \text{Manual Rate} \tag{20}$$

Please note that formula (20) is equivalent to formula (6) where the constant b is assigned the value 0.

The policy fee would vary within the limits in accordance with the premium (or payroll) volume and possibly also by industrial groups.

The last method would be equivalent to the formula

$$P = \alpha p + \beta \tag{21}$$

prevalent in life insurance and although not publicized used quite effectively in connection with Self-Insurers' release policies in a somewhat modified form. This suggestion seems also to sound like an echo of some remarks in Mr. Perryman's last presidential address.*

* In this connection it may be also well to refer to a paper by Joseph Woodward, "Provision for Expenses in Workmen's Compensation Premium," *Proceedings*, Vol. III, pp. 140.

It would undoubtedly require careful study and analysis to determine the values of β so that the results of their application are both adequate and reasonable.

While excess premiums calculated under either of the above suggestions would be somewhat less than those produced by the revised advisory rates (depending, of course, on the selection of the permissible loss ratio or the determination of the values for β), there will still exist a wide gap between the actual experience on excess policies and the premium charges.

There are several possibilities which may account for this situation. In the first place the excess costs determined by the study are based on the entire body of the insured experience. Still Self-Insurers are more analogous to the group of large risks, say those with an annual premium of $5,000 or over.

The retrospective rating plan especially designed to appeal to self-insured risks recognizes a gradation of expenses by size of risk. Surely the type of coverage provided under an excess policy as well as the fact that most Self-Insurers present fairly large entities seem to warrant a reduction in certain elements of expense loading, particularly commissions since the "service" to policyholders would be negligible.

Another and perhaps more effective approach to this problem would be the introduction of experience rating for this type of coverage. A study would be necessary to evolve a sound experience rating plan and it would be desirable to re-examine the cost element in light of the experience of a substantial number of Self-Insurers. This, of course, might be fraught with insuperable difficulties.

There are, of course, other methods available to Self-Insurers who desire to reduce the cost of excess insurance but they lead to considerations which are entirely beyond the scope of this discussion.

AUTHOR'S REVIEW OF DISCUSSIONS

MR. JAMES M. CAHILL:

Two motives prompted me to write this paper: the first, to publish the latest available data on excess costs for the information of casualty insurance men generally; and the second, to give

the reinsurance companies and others who are interested in excess coverage for self-insurers under the New York Workmen's Compensation Law an opportunity to review and criticize the rate-making method evolved by the Actuarial Committee of the Compensation Insurance Rating Board. I had in mind that the entire situation with respect to this form of coverage has been so unsatisfactory in recent years that the Insurance Department might wish to approve the revised method, when filed, to be effective on a mandatory instead of an advisory basis. Under the circumstances, all parties in interest should be furnished with the full facts in order to enable them to develop the arguments for their viewpoint.

The discussions by Mr. H. G. Crane and Mr. Mark Kormes were written in a critical vein with respect to various elements of the rate-making method. This is what I asked for, so I should be happy about the whole thing. With several of their points I do not agree, however, and it is therefore necessary for me to add a further word on this subject.

Both Mr. Crane and Mr. Kormes made the observation that they consider the pure premiums developed for the excess coverage to be too high because they are based on the indications of the total experience for New York State. It is their thought that, since the larger risks develop more favorable pure premium experience than the small risks in the case of full coverage, the same condition should hold true with respect to excess coverage. Furthermore, it is not practicable to perform an experience rating calculation based on the self-insurer's statutory experience to determine the extent to which the manual rate for full coverage should be modified before proceeding with the computation of the excess coverage rate. I admit that there is some merit to these two points. I believe, however, that any tendency towards redundancy in the excess pure premiums resulting therefrom is more than offset by the following items:

(1) The excess pure premiums are actually low because the excess cost for cases involving life payments was determined using tables on a 3.5% interest basis whereas an interest rate of 2.5% would be more appropriate for today's investment conditions. In support of this statement, it may be said that the New York Workmen's Compensation Law provides for determining the present value of tabular cases on the equivalent of a 2.5% interest basis for claims

with date of accident on and after July 1 1941. Such a change in the interest rate used in evaluating tabular cases would have a very substantial effect upon the amount of the excess cost as computed in this study.

(2) In this analysis, claims incurred under ex-medical coverage were not built up to what the cost would have been on a statutory medical coverage basis because such information was not available. Since the excess coverage policy provides indemnification to the self-insurer for losses, including medical, in excess of his retention, it is apparent that this failure to adjust losses incurred under ex-medical coverage to the equivalent of statutory medical coverage has tended to depress the indicated excess cost somewhat.

(3) There was a very bad catastrophe which occurred during the experience period of this study but for which the excess losses could not be included because the liability of the carrier was not decided in the courts until after the fourth report under the Unit Statistical Plan had been submitted to the Board. This was the well known "Observation" disaster, where the question as to whether the claims came under the New York Compensation Law was not adjudicated until many years after the date of the accident. The courts held that the New York Compensation Law applied and the losses incurred by the carrier which had written the policy for the contractor amounted to more than $670,000.

(4) It is my impression that most of the very costly catastrophes occur on the larger risks.

(5) With regard to costly single cases, I am inclined to believe that the excess portion over $10,000 per case would run higher for the larger risks than for the total experience of the state. The cost of such cases is in fairly close relationship to the annual wages, which probably are higher in the larger establishments.

These five points certainly outweigh those made by Messrs. Crane and Kormes and vitiate their argument that the excess pure premiums proposed are probably redundant.

Considerable space was devoted in both discussions to the question of the proper expense loading. Unfortunately, this matter is largely one of judgment, since it is virtually impossible to prove one's point. It is the same type of problem as that which faces us with regard to full coverage where a graduation of the expense loading by size of policy has been introduced effective July 1,

1941, largely on a judgment basis. The Actuarial Committee established the expense loading which, in its judgment, would produce the expense provision necessary for the writing and servicing of excess coverage policies. I don't know just how reinsurance companies determine what they consider to be the proper expense loading, but it is undoubtedly a fact that they wouldn't contemplate making detailed payroll audits such as direct writing compensation carriers normally do, for example.

Mr. Crane criticized the proposed expense loading formula in that provisions for the Department of Labor assessment and for the Security Funds tax were incorporated. Justification for the former is found in the fact that the insurance carrier becomes directly liable to the claimants in the event of the insolvency or bankruptcy of the self-insurer. Under such circumstances, it appears that the insurance carrier would likewise be liable for the Department of Labor assessment on such compensation payments. With regard to the Security Funds tax, Mr. Crane is undoubtedly familiar with the fact that the question has not been definitely settled as to whether the premiums for this form of excess coverage are exempt from the Security Funds Tax. The Insurance Department is currently reviewing this problem from the legal standpoint, but its attitude to date has been that the tax is payable on the premiums for such excess coverage as well as on the premiums for full coverage policies.

Mr. Crane gave an explanation as to why we should consider the actual loss ratio for the business of reinsurance carriers to be 36.7% instead of 91.5%, this improvement being effected by eliminating the experience attributable to a single risk. My comment is that, by using this same device, underwriters can invariably demonstrate that what has been an unfavorable class of business in the past nevertheless appears to be satisfactory as respects future underwriting policy. The argument used is that the risks which proved to be undesirable have been eliminated through cancellation or otherwise. This is not sound reasoning, however, since it ignores the fact that other risks of comparable quality may have been added.

I had previously been much disturbed by the results computed in Exhibit 11 which indicated such a wide discrepancy between the actual premiums charged for this coverage and the premiums

determined by either the present or the proposed rates for excess coverage. It did not seem reasonable that there should be such wide differences. The second last paragraph of Mr. Crane's discussion gives the explanation for which I had been groping. The answer is that no conclusions can properly be drawn from the test given in Exhibit 11 because the method of determining and applying the actual excess coverage rates is not comparable with that contemplated with respect to either the present advisory or the proposed rates. In the actual writing of this business, the carriers have disregarded the proper breakdown of payroll by classification and also, on interstate risks, average rates for the risk as a whole have been applied, although it is perfectly obvious that the rates for New York coverage should be much higher than those for other states with less liberal compensation laws. The present advisory and the proposed rates used in the test contemplate an accurate assignment of payroll exposure by classification in accordance with the rules of the Manual and are designed to measure the excess cost under the liberal New York Compensation Law. If a breakdown of the actual payroll data by classification were available, and if a proper adjustment in the actual rates to eliminate the effect of interstate coverage were made, I have no doubt but what the wide differences between the actual and either the present or the proposed premiums would be substantially reduced.

Whereas reinsurance carriers are probably not geared to obtain accurate detailed payroll audits incorporating the proper assignment of payroll by classification, this does not hold true of carriers which also write full coverage policies. In order to avoid the possibility of unfair competition, it appears to be only proper to require that excess coverage policies in New York be written on a proper classification basis. There also appears to be no good reason why the proper rate should not be determined and applied by state instead of merely applying an overall average rate.

As mentioned before, the situation with respect to this type of coverage has been very unsatisfactory, particularly in recent years, and it appears inevitable that it will be subjected to closer regulation than has been the case in the past. The schedule of proposed rates determined by the ratemaking method evolved by the Actuarial Committee of the Board can at least serve as the

starting point for discussion in the event that the Insurance Department rules that tariff rates must be established.

EX-MEDICAL COVERAGE—WORKMEN'S COMPENSATION

STEFAN PETERS

VOLUME XXVII, PAGE 112

WRITTEN DISCUSSION

MR. SEYMOUR E. SMITH:

Mr. Peters has given a thorough and comprehensive presentation of ex-medical coverage for workmen's compensation risks. The historical and descriptive matter in the paper calls for no discussion—suffice it to say that it is complete.

In the conclusions which the author draws from his investigations there are several recommendations made calling for changes in the existing procedure. The first two are: (1) that the actual permissible loss ratio underlying the rates for a particular state be used in calculating ex-medical ratios rather than the average permissible loss ratio of 60%, and (2) that the 20% retention of the medical pure premium in the ex-medical rate be reduced to a 5% retention. The first point is well taken, and the only thing that can be said in favor of the present method is that it is simpler in calculation and the resultant error is very small. As for the second suggestion, while it is perfectly true that the experience of medical payments made by carriers on ex-medical risks will not support the 20% medical pure premium retention, it is the opinion of the writer that the 5% suggested is a bit too small, and that a retention of 10% would be more desirable. This 10% recommendation is not made for covering expected medical payments to be made by carriers, but to cover the contractual liability of the carrier to supply medical aid should the assured fail to do so. In a state such as New York, which provides unlimited medical benefits as well as a free choice of hospital and physician, it is quite possible for a serious claim to incur $1,000 or $2,000 medical expenses a year over a period of 30 years or more, and there is some doubt as to an assured being in business 10 or 20 years hence. Of course this is an extreme example, but it would require very few such losses to wipe out

a 10% medical pure premium retention on ex-medical risks accumulated over several years. There is also the additional hazard due to the fact that the carrier does not have control of a claim from the medical angle. It is of interest to note however that Mr. Peters' suggestions have born fruit, and that on April 3, 1941, the Actuarial Committee of the National Council on Compensation Insurance adopted the following resolution:

> "Resolved, that effective concurrently with the next general revision of rates in each state, the ex-medical rates be determined on the basis of a retention of 10% of the medical pure premiums with appropriate variations for the state permissible loss ratio."

Thus the new formula for calculating the ex-medical rate will be:

$$\text{ex-medical rate} = \text{Standard Rate} - \frac{.90 \text{ Med. Pure Prem.}}{1.0 - \text{Acq.} - \text{Taxes}}$$

and the formula for determining the ex-medical ratio will be:

$$\text{ex-medical ratio} = \frac{.90 \text{ Permissible L.R.}}{1.0 - \text{Acq.} - \text{Taxes}} \times \frac{\text{Med. Pure Prem.}}{\text{Total Pure Prem.}}$$

The third change in the present procedure proposed by Mr. Peters is that the saving in claim expense on ex-medical risks be reflected in the ex-medical rate, and that a reduction of about 10% in the full claim provision would be a proper estimate in view of the lack of detailed experience. This proposal seems quite reasonable, although it is the writer's opinion that the saving in claim expense would follow the loss saving and be proportional to the ex-medical ratio, and that a reduction in the rate of 3% or 3½% of the ex-medical ratio would be preferable to the flat 10% reduction in the claim provision for all ex-medical risks.

As an addition to the section in Mr. Peters' paper covering the treatment of ex-medical risks under the experience rating plan it is of interest to note the method of handling these risks under the socalled Multi-Split plan. In this latter plan experience developed on an ex-medical coverage basis is treated in the same manner as for full coverage risks, with the following exceptions:

1. The primary expected losses are the product of the undiscounted expected losses and the ex-medical D ratio.

2. The undiscounted expected losses are converted to an ex-medical basis by applying to such losses the ex-medical multiplier

equal to 1.0 — (1.33 × the ex-medical ratio). This factor of 1.33 will of course be changed to $\frac{1.0 - \text{Acq.} - \text{Taxes}}{\text{Permissible Loss Ratio}}$ due to the recent action of the National Council Actuarial Committee.

3. The ex-medical excess expected losses will be the difference between the converted undiscounted expected losses and the primary expected losses.

4. The undiscounted expected losses on a statutory medical basis will be used to determine the B and W values.

Referring to Mr. Smick's paper on the Multi-Split Experience Rating Plan it is to be noted that the ex-medical D ratios are calculated as follows:

$$\text{D serious} = \frac{\text{Serious Indemnity Discounted}}{\text{Serious Indemnity}}$$

$$\text{D non-serious} = \frac{\text{Non-Serious Indemnity Discounted}}{\text{Non-Serious Indemnity}}$$

$$\text{D medical} = .20$$

Under the new procedure however the medical D ratio will be .10.

Under the Retrospective Rating Plan the recent action of the National Council Actuarial Committee will require a change in the calculation of the Loss Conversion Factor for ex-medical risks. The present factor applied to the expense portion of the Loss Conversion Factor (excluding taxes) is $\frac{.60}{.60 - \text{Ex-Medical Ratio.}}$ This will now become

$$\frac{\text{Permissible Loss Ratio}}{\text{Permissible Loss Ratio} - \text{Ex-Medical Ratio}\ \frac{1.0 - \text{Acq.} - \text{Taxes}}{.90}}$$

In the final section of his paper, Mr. Peters discusses, in regard to the Retrospective Rating Plan, the variance in the insurance charge in the basic premium between risks written on a full medical basis and risks written on the ex-medical basis. Since excess pure premium ratios have not been calculated on the basis of indemnity losses only, the author was forced to make certain maximum and minimum assumptions and then assume that the true results lie somewhere between these extremes. His investi-

gations indicate that the insurance charges for ex-medical risks are slightly deficient, but the writer agrees with Mr. Peters that the contingency margins are adequate to absorb this small amount.

MR. RUSSELL P. GODDARD:

If a layman were to stump the experts in a quiz contest, and win as a prize a set of twenty-five volumes of the *Proceedings* of the Casualty Actuarial Society, he might be interested enough to read all the papers presented by the worthy members, comparing the several methods of approach. He would find all kinds of papers, of course, but he would be most impressed by two main types which may be called, for want of better names, the literary and the scientific. The literary paper is full of classical allusions, Latin phrases, and quotations from poets and philosophers, both American and Chinese. The scientific paper, on the other hand, resembles a mathematical textbook, and in addition to its imposing collection of formulas, it literally overflows with charts, graphs and tables of closely packed statistics which have to be folded in double in order to get into the book at all.

Our layman would also notice, as he reached the back pages of each volume, that it is customary for each type of paper to be reviewed in its own vein. A literary paper gets a literary response. Shakespeare answers Milton, Childe Roland's slug-horn becomes impaled on Don Quixote's lance, and Christopher Morley is confounded by Confucius. A scientific paper, on the other hand, is discussed scientifically or not at all. Our members have shown a commendable reluctance to argue about the multiplication table.

All this is merely by way of saying that Mr. Peters has produced a very stimulating paper, definitely in the scientific tradition. After a thorough review of legal and underwriting restrictions, he outlines certain assumptions underlying ex-medical coverage and shows clearly what a consistent treatment of these assumptions would mean in the experience and retrospective rating plans as well as in manual rate-making.

The first part of the paper is, to a certain extent, an excursion into actuarial psychology, since Mr. Peters is interested, quite properly, not only in discovering the "true" formulas, but also in discerning the trend of actuarial thought on November 5, 1926.

Here the literary technique might have been used more effectively. It is not always possible to tell what an actuary is thinking about from his formulas, for

"Things are seldom what they seem
Skim-milk masquerades as cream."

This does not imply necessarily that actuarial technique is a mass of chicanery and subterfuge; it often happens, however, that a simple formula embraces more than appears on the face of it at first blush.

The old formula for ex-medical rates in its standard form was as follows:

$$\text{Ex-medical rate} = \frac{\text{Indemnity P.P.} + .20\ \text{Medical P.P.}}{.60}$$

The present formula, in use in all states except California, is

$$\text{Ex-medical rate} = \frac{\text{Indemnity P.P.} + .40\ \text{Medical P.P.}}{.60}$$

Neither of these formulas show, on their face, that any special assumptions have been made with regard to the expense loading. Mr. Peters demonstrates, however, that the second formula is equivalent to

$$\text{Ex-Med. rate} = \frac{\text{Ind. P.P.} + \text{Med. P.P.}}{.60} - \frac{.80\ \text{Med. P.P.}}{.80}$$

In other words a sizeable amount of expense, equal to 20% of the medical pure premium, is masquerading as medical in the 40% of medical pure premium retained in the rate.

Similarly, the old formula might be construed to be

$$\text{Ex-Med. rate} = \frac{\text{Ind. P.P.} + \text{Med. P.P.}}{.60} - \frac{1.067\ \text{Med. P.P.}}{.80}$$

If the ex-medical rate were expressed in this way, it would mean that the entire medical losses and a portion of medical claim expense had been deducted as well as the medical portion of acquisition and taxes. Actually, it appears that this interpretation was not used, since in the experience rating plan the expected ex-medical losses were taken as 60% of the final ex-medical rate.

Mr. Peters recommends a formula about half-way between the present formula and the old formula, since he would use .95 instead of .80 or 1.067 in the part to be deducted. The differences

may appear more clearly if an actual example is given, assuming a 60% loss ratio with medical losses equal to half the indemnity.

EX-MEDICAL RATE

	Old Formula	Present Formula	Proposed
Indemnity Losses	.400	.400	.400
Medical Losses	..	.040	.010
Claim Expense	.067	.080	.080
Administration	.075	.075	.075
Inspection & Bureau	.025	.025	.025
Payroll Audit	.020	.020	.020
Acquisition & Taxes	.146	.160	.153
	.733	.800	.763

It will be seen that the proposed formula would be very similar to the old formula except in the provision for medical losses and loss expense. The old formula, however, was found to be unsatisfactory because it did not "meet the needs" and before reverting to it, or part way to it, it would be desirable to determine as closely as possible in what respects it was deficient.

To begin with, ex-medical coverage is a form of partial coverage which has not always received the approval of state legislatures and is not always acceptable to the carriers. With any type of partial coverage there is the possibility of "selection against the carriers" which in the case of ex-medical coverage may mean that it will be selected by insureds who feel that their indemnity costs are high and their medical costs low. The fact that their medical costs may be lower than average is of no particular moment, as Mr. Peters points out. On the other hand, the possibility of high indemnity losses is something which should be guarded against. Furthermore, there is the possibility that an assured with a normal distribution of indemnity and medical losses under full coverage may find his indemnity costs rising if ex-medical coverage is adopted. If the insurance company pays both medical and indemnity losses it will not hesitate to authorize extensive medical treatment in the hope that indemnity payments may thereby be reduced. If the insured is responsible for medical treatment, however, the financial incentive to attempt to reduce indemnity payments by increasing medical is largely lost.

Under these circumstances it is not illogical to assume that a

certain amount of indemnity is masquerading as medical in the 40% of medical pure premium retained in the present ex-medical rate. Obviously the proportion of indemnity retained would vary from class to class, depending on the relationship of indemnity and medical pure premiums. The net result is that the final formula is extremely simple, but is not based on hard and fast assumptions with regard to the exact amount of safety margin which it is designed to produce. With a rough and ready formula such as this, there has been a natural reluctance to introduce variations by state to conform to varying expense provisions and permissible loss ratios.

The ex-medical manual rate, therefore, provides for full expenses and a small portion, equal to 20% of the medical pure premium, remains to cover a possible increase in indemnity losses and such medical losses as may be incurred, including those resulting from the insured's bankruptcy. In the manual rate it makes no difference whether this portion is called expected losses, safety margin, or contingency factor. In the experience rating plan, however, as Mr. Peters points out, "the expected losses must be determined in such a manner as to exclude all or almost all expected medical losses." To revert to the numerical example previously given, a risk with 100% credibility with indemnity losses equal to .400 and no medical losses would receive an experience credit of 9.1% if expected losses were taken at .440. This would mean, under the present formula, an adjusted rate of .727 which would be lower than the adjusted rate obtained under Mr. Peters' proposed formula. It would also be lower than the adjusted rate obtained under the old formula if expected losses were taken at .400 instead of .440. It becomes imperative, therefore, to decide whether the "expected medical losses" included in the manual rate should be treated as ratable or non-ratable in experience rating. This decision will be influenced by the fact that some of these expected losses have been included to cover the uncollectible losses resulting from the insured's bankruptcy. Obviously it would be almost impossible to collect such losses through the medium of experience rating.

In retrospective rating the assumption is made that there have been no medical losses incurred and that the amount collected for company expenses must be the same as would be collected for a

statutory medical risk. In retrospective rating, of course, the *fait* has all been *accompli,* so it would be possible to use one factor for indemnity losses and another factor for any medical losses which might have been incurred. The factor applicable to medical losses would have to be very small in order to be consistent with the assumptions made in calculating the regular loss conversion factor.

Mr. Peters has shown that the amount of actual medical losses incurred under ex-medical policies is very small. There exists, however, the possibility that such losses may be incurred as well as the possibility that indemnity losses may be larger under an ex-medical policy than otherwise. These losses will probably not be evenly distributed among all risks and it will consequently not be possible for the carriers on the risks to collect sufficient premium for them through the operation of the manual rate-making procedure or the experience rating plan. If this is true, some method should be devised to insure the collection of sufficient premium to cover this rather fortuitous type of loss.

Another suggestion made by Mr. Peters is that an investigation be made to determine if claim expenses are reduced because of the exclusion of medical payments. The usual assumption is that claim expenses are 8% of the premium if losses are 60%, and that this same relationship holds when the permissible loss ratio is altered. Claim expenses therefore are usually treated as approximately 13.3% of losses regardless of the fact that the proportion of large and small losses, or the proportion of indemnity and medical losses, varies between states and industry groups. In view of the fact that the total volume of ex-medical business is comparatively small, it would be difficult to make a study which would show conclusively that any variations from the normal claim expense ratio were due entirely to the elimination of medical payments.

Similar objections might be raised to the proposal that the insurance charge for ex-medical risks be different from that for other risks on the assumption that the insurance charge is affected by the proportion of medical losses. It would be difficult to justify such a departure without first making sure that other departures should not be made for differences between states and industry groups. In any event, as Mr. Peters foresees, a change

such as this in the insurance charge would probably not alter the basic premium ratio but would only affect the contingency margin.

AUTHOR'S REVIEW OF DISCUSSIONS

MR. STEFAN PETERS:

The constructive criticisms expressed in the discussions of Messrs. Seymour E. Smith and Russell P. Goddard will certainly contribute to the clarification of thought and improvement of methods dealing with ex-medical coverage in Workmen's Compensation Insurance.

The main objection raised in both discussions against the modification of the formula for the ex-medical manual rate which was proposed by the author is based on the assumption that for ex-medical risks there exists an anti-selection against the carriers with respect to compensation losses; that is, both reviewers believe that it is likely that indemnity losses of ex-medical risks may be relatively higher than those of comparable risks insured on a statutory medical basis. The theory underlying this assumption is that in those cases where the carrier insures both indemnity and medical payments it may sometimes feel induced to spend an extra amount for medical care in order to reduce the duration of compensation payments, while in those cases where medical payments are borne by employers no incentive exists for the latter to reduce the duration of the compensation payments by increasing the amounts made available for medical care.

I agree that, on its face, this argument has some probability of being true. I wanted, however, to check against the actual experience, within the limits permitted by not too extensive a study, whether this assumption is proven by facts. In order to obtain a fair comparison between ex-medical and statutory medical indemnity costs, indemnity losses incurred under the same classifications and for risks of approximately the same size must be compared. This was done in the following manner: Certain classifications which produced a substantial volume of payroll exposure under ex-medical coverage in New York in policy year 1938 were selected. The selection was further made in such a manner as to

lead to a fair proportion of ex-medical coverage for each industry group. The selected classes are shown below:

1164	3081	3634	6251	8742
1439	3082	4150	6252	8810
1605	3179	4304	6254	8833
2021	3241	4875	6872	9015
2402	3548	5057	7309	9040
2581	3612	5213	7380	9052
3002	3632	6217	8039	

For each of these classifications the indicated indemnity pure premiums for statutory medical coverage were computed and then the ex-medical payrolls were extended at these indemnity pure premiums. The resulting theoretical indemnity losses for statutory medical coverage were compared with the indemnity losses incurred under ex-medical coverage.

In order to eliminate, as far as possible, differences in the distribution by size of risk between statutory medical and ex-medical experience, only the experience of risks with annual premium size over $5,000 was taken into consideration because, below this size, practically no ex-medical coverage exists. The experience of each classification was further subdivided into two risk size groups, namely $5,000—$9,999 and $10,000 and over. The indicated indemnity pure premiums for statutory medical coverage mentioned above were determined separately for each of these size groups and then multiplied by the corresponding ex-medical payrolls, so that for each classification and each risk size group separately theoretical indemnity losses for statutory medical coverage could be compared with the corresponding indemnity losses for ex-medical coverage. Since, however, the experience for the individual classes and size groups was not of sufficient volume to be considered separately, the theoretical indemnity losses for statutory medical coverage and the indemnity losses for ex-medical coverage were totaled for both size groups and all classifications and thus the figures in line (*a*) of the following table were obtained. The figures in line (*d*) were derived by totaling the figures for both size groups and only those classifications belonging to the contracting industry group. The determination of the figures in lines (*b*), (*c*), (*e*) and (*f*) is self-explanatory.

WORKMEN'S COMPENSATION — NEW YORK

Comparison of Indemnity Losses for Statutory Medical and Ex-Medical Coverages
Policy Year 1938 — 1st Report

Item	Ex-Medical Payrolls	Ex-Medical Payrolls Extended at Indicated Stat. Med. Indemnity P. P.'s	Actual Incurred Indemnity Losses for Ex-Medical Coverage	Ratio (4) ÷ (3)
(1)	(2)	(3)	(4)	(5)
(a) All Classifications.....	$63,304,938	$586,552	$616,324	1.051
(b) Code No. 6251—Tunneling.	3,045,598	156,544	212,576	1.358
(c) All Classifications excluding Code No. 6251 — Tunneling (a) — (b)	60,259,340	430,008	403,748	.939
(d) Contracting Classifications.	6,776,263	301,562	360,815	1.196
(e) Contracting Classifications excl. Code No. 6251 — Tunneling (d) — (b)	3,730,665	145,018	148,239	1.022
(f) All Classifications excluding Contracting Classes (a) — (d)	56,528,675	284,990	255,509	.897

It is seen from this table that, while in the aggregate the indemnity losses for ex-medical risks are about 5% higher than those for statutory medical coverage risks, this result is entirely due to the inclusion of one classification—Code No. 6251 "Tunneling"—which enters into the experience with a disproportionately large amount of losses. If this class is excluded, the indemnity losses of ex-medical risks are 6% lower than those for statutory medical coverage risks. The exposure under Code No. 6251 was incurred primarily in one operation, namely the construction of the Delaware Aqueduct Project for the City of New York. The experience incurred in this project differs materially in many respects from the average compensation experience in New York State and it is therefore felt that the exclusion of this classification from the study would be justified.

The figures for the Contracting Industry Group show further that in this group the indemnity losses may actually be slightly higher for ex-medical risks than for statutory medical coverage risks whereas no such tendency can be discovered in the other industry groups.

It is not claimed that these results give a final and conclusive answer to the question whether ex-medical risks incur higher indemnity costs than statutory medical coverage risks because the volume of the experience employed in the study is not sufficient. I believe that, as far as this investigation goes, the answer would be negative, however.

The reference of Mr. Smith to the estimate of the reduction in claim adjustment expenses for ex-medical risks does not take account of the fact that in the paper it was estimated that the claim adjustment expense would be reduced by about 10% of the claim adjustment expense relating to medical losses and not of that relating to total losses. This would mean a reduction of the claim adjustment expense provision in the manual rate by about 1% times the ex-medical ratio and would be almost negligible. Besides, the proportion of 10% of the claim adjustment expense for medical losses is a very rough estimate and I agree with Mr. Goddard that it would be very difficult to obtain any reliable justification for it on the basis of actual experience.

Mr. Goddard remarks that experience modifications computed by the method in use heretofore will tend to develop larger credits for ex-medical risks than will be the case under the proposed method because the expected losses under the old system include 20% of the expected medical losses while under the proposed system a smaller proportion of expected medical losses is included. I believe that this is quite proper because, if it is thought that the ex-medical pure premium should include a certain proportion of the medical pure premium the same should be true with respect to experience rating and the actual losses should properly be compared with those expected losses which are obtained by multiplying the exposure by the ex-medical pure premium.

In his introductory remarks, Mr. Goddard makes a brilliant analysis of the two main styles—the literary and the scientific—in which papers can be written. I think that everybody who has read his discussion will agree that he is equally master of both styles, the first being ably illustrated in the introduction and the second being exemplified by his critical remarks. I should like to follow Mr. Goddard's suggestion to use the literary style where it

is indicated but I am afraid that my lack of talent in this field induces me to stay in the comparatively safe realm of scientific language.

RECENT DEVELOPMENTS IN NEW YORK COMPENSATION RATE MAKING

ROGER A. JOHNSON, JR.

VOLUME XXVII, PAGE 144

WRITTEN DISCUSSION

MR. N. M. VALERIUS:

Mr. Johnson's paper gives a brief and accurate report of the latest refinements in compensation rate making for the great industrial empire of New York. As this state expends for compensation insurance one-fourth, more or less, of the entire expenditure in the United States for such protection, inevitably it is in a position of leadership in compensation rate making.

The first development discussed in the paper, namely, keying of rate levels to the results of the most recent completed twelve months of issue or "policy month" experience seems at this time to have brought us almost to the ideal in respect to this item. Of course, it is not implied that twelve months experience would be ideal in a lesser state.

The treatment of the general occupational disease portion of the experience and of the rates seemed very fair in view of the current status of statistics and knowledge of this item, as it must be remembered that only a part of the experience is on the basis of the all-inclusive law.

With respect to the catastrophe provision until and unless further study indicates a proper departure from the present, it is better for all concerned that error therein, if any, be in favor of the carriers' surpluses.

The second and third developments mentioned by Mr. Johnson relate to the determination of loss constants and their offsetting adjustments. A proper refinement seems to have been made in introducing the "k" factor in the formulas and, on the other hand, it was demonstrated that no material error arises from the appli-

cation of loss constants by "risk's governing classification" and application of the offsets by classification.

The next and last section of Mr. Johnson's remarks, "New York Expense Loading," with a brief history thereof, is valuable for reference, and was included because the loading had been under scrutiny and continues so to be although there had been no very recent adopted change.

Temporary or variable items it has not been deemed permissible or expedient to take into the expense loading in quite a parallel place with items of long standing and this tends to confusion. The lines between what should be provided for by a law amendment factor, a special factor, or a change in expense loading are hazy. Hence exhibits have appeared on occasion in which some items of expense have had to be found in a contingency provision, if any, or been unprovided for altogether. Also, in the experience rating plan the permissible loss ratio of .605 was ostensibly retained similarly because of the temporary or variable character of the variation therefrom when .598 say was the accepted value with the result that for some time past in explaining the rating factors the situation has been something like a conversation in code in which we agree to call certain things things they are not with resultant difficulties of thought adjustment.

These remarks on the expense loading are not meant to be in criticism of present methods but merely by way of thanks to Mr. Johnson for setting out the matter clearly in a readily available place.

INFORMAL DISCUSSION

WHAT STEPS SHOULD BE TAKEN BY AMERICAN CASUALTY COMPANIES TO PROTECT THEMSELVES AND THEIR POLICYHOLDERS AGAINST THE POSSIBILITY THAT DEVELOPMENTS IN THE WAR MAY MAKE IT INADVISABLE OR IMPRACTICABLE TO SECURE ADEQUATE EXCESS LIMITS OR SPECIAL RISK PROTECTION IN FOREIGN MARKETS?

INSURANCE PROBLEMS AND RATE-MAKING PROCEDURE IN CONNECTION WITH UNITED STATES GOVERNMENT DEFENSE PROJECTS.

AS RESPECTS THE LIABILITY LINES, WHY NOT ISSUE UNLIMITED COVERAGE AS STANDARD COVERAGE, SUBJECT TO LIMITATION BY ENDORSEMENT IN EXCEPTIONAL CASES?

MR. HAROLD J. GINSBURGH: We are fortunate, I think, in having before us for informal discussion three questions of two distinct types. Two of these questions are of very current and vital interest; the third is one which should be very productive of thought. The idea of these discussions is to avoid any formal presentations. We shall have, I hope, in the case of each question, someone who will start the ball rolling. I hope that in each case the one who starts the ball rolling will also develop some further questions, and that other questions and commentaries will come from all sides of the room. Without further ado, let us begin. I think perhaps we might start with the first of these questions: "What steps should be taken by American casualty companies to protect themselves and their policyholders against the possibility that developments in the war may make it inadvisable or impractical to secure adequate excess limits and special risk protection in foregn markets?" I wonder if Francis Perryman will start us off on that.

MR. FRANCIS S. PERRYMAN: I thought maybe you wouldn't get around to me, and that I might be spared, but since I have to take part I shall do what Mr. Ginsburgh has suggested, namely, give you a few lines of thought and hope that others will elaborate on them. At the outset I wish to make it clear to you, if necessary, that my discussion of this subject must not be taken as indicating a belief that there is necessarily any immediate possi-

bility, or even probability, that war developments may bring about the events the question seems to imply.

The question is a timely one because, regardless of views as to the future development of the war, and the future position of Lloyds and other foreign reinsurance markets, it certainly involves the question as to whether the local reinsurance market here is adequate and also even the question as to whether and why there should be a local reinsurance market. First of all, assuming that events get materially worse on the other side, and that some of the foreign markets cease to operate in their present manner, it doesn't necessarily follow that those markets will be closed out to, say, American companies. If anything drastic happens I should imagine any market affected will be moved, as, for instance, Lloyds, from London to Canada, with no cessation of operations. As you know, Lloyds has a lot of funds on deposit in this country. This view, however, is beside the point. The question raises the thought as to why the American market shouldn't be built up, if it needs to be built up. The existence of foreign markets, of course, does tend to keep local reinsurance companies in line so that we can make a reasonable deal with them. We know that local reinsurance companies have to retrocede a lot of their business abroad and that this would be impossible if the foreign markets were closed. I think it more appropriate for them to tell you about that. Fire insurance involves a catastrophe hazard which is customarily spread all around so that if there is a large fire in San Francisco, or Chicago, or Tokio or anywhere, the effect of that is felt all around the world because the reinsurance is spread out that way. In casualty insurance you don't contend with that kind of catastrophes. Even when we had a hurricane here a few years ago it didn't have any such effect on casualty insurance. It broke a lot of glass and blew a lot of trees down, and some companies collected substantial amounts by way of excess reinsurance, but nothing like the amounts that would be involved in a good-sized conflagration.

On other lines, such as burglary, accident and health, we don't have much difficulty in reinsurance. Occasionally we get a burglary policy for, say, a state treasurer to cover $5,000,000 or $10,000,000 and then we have to stretch the local market quite a bit. There are, however, a few lines where it is rather difficult

to get reinsurance in a local market for several reasons. One is that there are some kinds of reinsurance desired which I believe are not even permitted to be written by local companies. That is something that can be adjusted if necessary.

One particular kind of insurance in which I am interested in personally, and for which it would be rather difficult to get adequate coverage without utilizing the foreign market, is aviation insurance, particularly with respect to passenger liability on scheduled air lines. There are three groups that write aviation business, but one of them does not write scheduled air lines. With three groups writing aviation insurance, a whole lot of liability finds its way to Lloyds of London. Without them it would be quite difficult to take care of the business. I think, however, that special steps could readily be taken. For instance, the three groups, together with local reinsurance companies, could participate and provide the necessary coverage. But that isn't being done at present. Then there are a whole lot of trick reinsurances that companies can and generally do buy from Lloyds of London or abroad, which could very well be dispensed with or obtained from the local market if desired. These to my mind are not very important and a whole lot of them are superfluous. I know in our own company we have done without a lot of this kind of reinsurance.

MR. WINFIELD W. GREENE: This question, as worded, is chockfull of implications. It seems to imply a dearth of domestic casualty reinsurance facilities and difficulty in obtaining admitted reinsurance in adequate limits. I am sure that on the whole these implications are not justified. Everyone here present is, I am sure, familiar with the term "accommodation business." Well, reinsurance companies admittedly write "accommodation reinsurance" from time to time but like direct writing companies they are not disposed to do so unless they have something to justify the accommodation, namely, a fairly substantial and profitable going account. It follows that a company which does not, as a rule, patronize the domestic reinsurance market to any substantial extent may find it rather difficult to obtain certain odd coverages in that market. As for the great majority of direct writing casualty companies which are consistently faithful to the domestic

reinsurance market, I venture to say that they encounter very few cases where they have difficulty in obtaining any reinsurance coverages which are really needed to take care of their business. Undoubtedly there are a few cases where very large limits are required which present some difficulty. In some but by no means in all of these cases, the high limits are actually needed. The operations of oil companies and public utilities properly call for large limits of property damage cover in certain instances. In the boiler and machinery field, the demand for high limits particularly in respect of use and occupancy coverage has increased greatly during the past few months mainly because of conditions arising out of the war, such as anticipated difficulty in replacing power plant equipment. On the whole, however, I would say that the domestic casualty reinsurance market has proven adequate except possibly to a very minor degree.

It is true that the domestic reinsurance companies are using the London market for retrocessional purposes, as they have been consistently doing for a long time. I am sure that all of the reinsurance companies have given considerable thought to the question as to whether this practice should be continued and I have no doubt that the corresponding question has also been studied carefully by primary carriers and self-insurers which are directly using the London market. My own conclusion is that thus far there is no justification for making a change. However, should it come to pass, and I sincerely hope that it will not, that that market will no longer be available, then there will be a problem for the domestic reinsurance companies but one which I believe can be met rather promptly. As for limits, and rather substantial ones, required in the ordinary course of business, I have no doubt that the situation can be met immediately through co-operative action of the reinsurance companies. As for the few cases involving exceptionally high limits, it would apparently be necessary to arrange a second excess bringing in the direct writing companies for small participations for that purpose.

Incidentally the few cases which really require exceptionally high limits do not involve enough premium to justify the investment of new reinsurance capital.

Reference has been made to dependence on the London market for reinsurance facilities in the aviation insurance field. It seems

to me that this situation could be adjusted very quickly through an exchange of reinsurance among the existing aviation insurance groups coupled probably with greater use of the facilities of the domestic reinsurance companies. It is true that the reinsurance companies have not to any great extent been a factor in the aviation field for some time. This, however, has been due to the fact that the covers which they have been asked to write heretofore have generally been of the excess of loss type, wherein a large potential exposure was coupled with a very small premium revenue. I believe that the reinsurance companies could readily be brought into the aviation picture if they were given the same type of participation as that assumed by the direct writing companies, that is, quota share from the ground up. In short, Mr. Chairman, I see no reason why the aviation casualty reinsurance situation presents any difficulties which cannot be adequately cared for if appropriate steps are taken.

MR. GINSBURGH: It seems to me that the previous two speakers have given us the impression there isn't a great deal to worry about, at least according to present indications. We have had a very fine outline of this problem, with statements of opinion on present conditions. If nobody at the moment desires to discuss the question further, perhaps we can return to it later on.

Question: Would Mr. Greene be a little more specific?

MR. GREENE: I understand the question is "How long would it take to form an adequate casualty reinsurance market if the London market became unavailable?" A substantial amount of reinsurance coverage could be absorbed by the professional reinsurance companies among themselves. This step should not take long—if the need for such a step were definite, it could be accomplished in a few days. In order to handle the cases involving exceptionally high limits, it would be necessary to arrange a second excess with small percentage participations by the direct writing companies. Assuming general cooperation in this idea, this second step still might take a few weeks' time.

MR. JOSEPH P. GIBSON, JR.: It seems to me part of this situation is tied up with the matter on which Mr. Perryman commented. Lloyds of London is always in the background. It seems the

buyers over here are getting a break. The so-called professional reinsurer over here has more or less had to cut its pattern according to Lloyds' competition, which is in the background. For that reason, the casualty reinsurer has never to any extent been able to sit in the driver's seat. In the case of the munitions situation, for example, the companies have normally handled their workmen's compensation reinsurance according to their own desires, which is as it should be. Those same methods, however, could be applied to the munitions situation, particularly with respect to workmen's compensation which requires a policy of unlimited liability. At the moment, most of us don't know exactly what is going to happen to this munitions plan. Reinsurers have been very much interested in the details, but as far as I can find out, they have to read the papers for the results. Meanwhile, as Mr. Greene said, we reinsurers have attempted to do something constructive by getting together and getting the feel of each other's elbows, so that when the time comes we can do something. But it will take a little more than 2%, for instance, to handle excess on explosives, and my present conclusion on the question as to what steps should be taken would be that the American companies have taken as many steps as they can. They are all dressed up and, frankly, have at the moment no place to go, until it appears just what the munitions plan will provide for the purchase of reinsurance. The reinsurer, of course, knows that he is subject to examination by the insurance departments, and is under the practical necessity of accepting business only at an adequate premium. Those companies which have reinsurance with foreign reinsurers will, I think, find the American market adequate if a redistribution is necessary. So far as the market is concerned, if there is a retrocession abroad, I suspect that in 24 hours the American reinsurers could get together and provide adequate facilities.

MR. GINSBURGH: References have been made by both the last two speakers to the matter of munitions. This leads very naturally to the next question we are going to consider—"Insurance problems and rate making procedure in connection with United States Government Defense Projects." I would like to ask Mr. Cahill if he would start us off on that.

MR. JAMES M. CAHILL: I shall have to confine my remarks to the compensation field, because I have not recently been in close touch with the liability and surety lines, although I am sure that the problems there are equally as trying as those we have in the compensation field. I think you can sense what we are up against in connection with these national defense projects from the tempo at which we have been moving during the last few months.

As I recall, in the first part of this year there was agitation to set up a special classification for military cantonment construction. There were two good reasons for that proposal. The first was the desire to segregate this experience and not have it enter into the classification experience and thereby affect the rates in the future for ordinary contracting operations. On the basis of the first World War experience, it was thought that there probably would be overtime payrolls, etc., which might tend to produce loss ratios more favorable than the permissible. The second reason was the desire to set up a composite classification since there is much interchange of labor in connection with such projects. It would have been a very difficult problem for the payroll auditors to assign the payroll to the proper classifications if a special composite class had not been erected. I know that in New York, as is likewise true in other states, the rate established for the military cantonments construction, classification reflects all these views. It was pitched somewhat low in recognition thereof.

Subsequently, there was filed in most states, I believe, a program calling for a 20% reduction in rates for defense projects where the Government enters into the selection and approval of the insurance carrier. The reduction in rates was justified as coming entirely out of the expense element, but anyone who studied it very carefully could see that this statement probably was not entirely true. The reduction undoubtedly reflected the expectation that the loss experience would be better than average.

Then we had the problem come up of what to do in the case of joint ventures. On many of the Government projects where the contracts are on a cost-plus-a-fixed-fee basis, several contractors are invited to participate in the work and they are insured as joint venturers. Each such joint contractor really comprises a new risk and should properly be manual rated. But a program was worked out whereby in New York, for example, we

are to apply the arithmetic average of the outstanding experience modifications for such joint venturers. In New Jersey, a weighted average is computed and used. In New York we had at least one company protest very strongly against the use of the arithmetic average method. The reason, I think, was that they were particularly interested in one large contract on which it made a tremendous difference whether the weighted average method or the arithmetic average was used. I am no underwriter, but I question the judgment of some of the men who are striving so hard to obtain this business. I am thinking of one large contractor in New York who carries an experience rating credit of 52.5% today which was developed not on the basis of manual-rated classifications like carpentry, masonry and concrete construction, but on certain (*a*) rated classifications for which the rating formula employed may be all wrong. The 52.5% credit is probably correct when applied against such (*a*) rated classification, but it is questionable whether the same credit should be applied against manual-rated classes. I am further convinced of that view because I know that some years ago when this contractor was doing work which called for application of manual-rated classes, he had a debit of over 100%. All this makes me very fearful of what may happen on those defense projects where we start with a 52.5% credit for this risk and later allow a further credit of 20%. In other words, the risk is actually written for 40% of manual. I don't think it can be done and have the carrier break even on it.

Pressure next came in connection with overtime payrolls; it was contended that overtime payrolls should be excluded from the audits. The next point advanced was that, instead of assigning the payrolls of watchmen, timekeepers and superintendents to the governing classification, as is called for by the manual rules, Code No. 5610 which carries a low manual rate should be allowed.

Finally, we have had presented to us a plan, apparently having the approval of the War Department, which is proposed on an optional basis but which, it is said, will be mandatory for all sizeable War Department contracts. It has been a one-way street so far, and I think that it is about time we took another good look as to where we are going because if we cut and cut and cut, we can be sure that the experience of the last war will not be

repeated in connection with insurance lines this time. Companies instead of having very low ratios, will have high ratios. I am not condemning the latest plan, because I have not had the opportunity to give it full study, and I think it is a plan which must be studied. If any state approves this plan, it should be with the knowledge and thought that it appears to be thoroughly sound, and not just something we have to take and like. I don't believe we have come to that situation in this country yet. We can still say what we think, and we can point out anything that is wrong with the plan. I believe that the War Department will give us an opportunity to express our views and will listen to us if we are convinced that the proposed plan is unsound.

So far I have been talking mainly about these cost-plus-a-fixed-fee jobs, but, in addition to that, there are numerous contracts where the work is obtained by the contractor on a bid basis. The question has come up as to whether such experience will be included with the regular experience of the contractor or manufacturer. Risks are interested in this point because of the experience rating angle. They want to know whether in the future such experience is going to be included or excluded in rating. Some risks undoubtedly will want it in, and others will want it out. As a workable rule, it would seem that such experience must be included with the normal experience of the risk.

MR. GINSBURGH: This was a very interesting discussion of the subject. I would appreciate it if Mr. Pinney, our President, would talk on this particular topic. I know he has had a close connection with it.

MR. SYDNEY D. PINNEY: Mr. Chairman, I think Mr. Cahill has covered very well the background leading up to the present situation. I sat in on certain discussions after the War Department rating plan had been presented. After this plan had been pretty well formulated, we raised questions as to the expense provisions in the plan and the maximum provision. For those who don't understand exactly how that plan works, I might just briefly outline it. The plan is to operate on the basis of what is essentially a retrospective rating formula, with the premium determined finally on the basis of using a fixed charge percentage applied against the so-called standard premium, plus the incurred losses.

plus 12% of the incurred losses for payment of adjustment expenses, plus allocated loss expense—all subject to a maximum equal to 90% of the standard premium. The fixed charge percentages are graded downward as the risk size increases. They start at 37% for a $5,000 risk, and grade down to 6½% when you reach $400,000 of premium, and at $700,000 they drop to 6.3%.

The plan applies to the combined experience of compensation, automobile liability and miscellaneous liability. The standard premium is determined by using full manual compensation rates, without any experience rating modification that might be in force for the individual contractor, and 50% of the manual rates for automobile and Other liability. That is the way the policy would be written, on the basis of full manual rates; for example, on automobile liability, using 50% of the manual rates without any recognition of experience rating modifications or the fleet rating plan. Then there are certain other modifications to determine what the manual rates on automobile liability are to be. That is essentially the way the plan is set up. The plan operates on a so-called project basis. In other words, if you have a contract, say, that is going to run for two or three years, this plan applies to the combined experience over that period. However, if you have operations that are on an indefinite term contract basis, like munitions manufacturing, for instance, which might be let on cost-plus basis, there is a stop at the end of two years. In other words, a maximum period of two years would be used for rating.

Now, to a certain extent, this has come about through the War Department's feeling that either the companies weren't moving fast enough, or the remedies the companies were setting up weren't going far enough. In the 20% flat discount plan, for example, I think the Government felt that 20% wasn't enough. So they went right down to rock-bottom by putting in a percentage charge for expenses, and using the actual losses. We had considerable discussion with the representatives of the War Department when the plan was finally presented, and it was quite evident that they felt this plan was going to work out all right from the standpoint of the companies. It will, provided we have enough for expenses and adequate provision for protec-

tion under their maximum. We had to argue with them to keep them from cutting the maximum down even further. As it is, there is very little so-called insurance charge in there to protect us against losses going over the maximum, and therefore, we should be protected by a maximum premium which shouldn't be lower in any way than 90% of the standard premium. That viewpoint finally prevailed. The War Department representative made the statement that if it was found that the plan didn't work out satisfactorily from the standpoint of the companies, the War Department would be willing to revise the plan.

One of the things we have to check is, how much should be allowed for expenses; another is the maximum limit. These two points are of prime importance, and we don't know how the plan is going to work out. There has been some question about fixing the standard premiums at full manual compensation rates—with the effect of inflated payrolls due to high wage rates and overtime, plus the fact that employees disabled during a period of this kind are not apt to malinger. They want to get back to work, as their wages are high in proportion to compensation benefits. We have one large risk where they had no lost time due to accidents last month. In other words, all the accidents were simple medical cases and there was no lost time element involved. There have been other cases where the loss ratio at current tariff rates is 30%, 20%, or down in even lower ranges.

It is unfortunate that we had to move on this plan with considerable pressure behind it, but that is simply part of the whole set-up that we are facing today. Industry as a whole is being forced by the Government to move fast and do things that they would ordinarily like to take a little more time on. I think there is a feeling that we don't like to be pushed and be told by someone else that we have to do something. We want to stop and think it over, as Mr. Cahill has pointed out, and see where we are going. We must probably, in this case, rely on the statement made to us by the representative of the Government, that if the plan is found to have gone too far in reducing the provision for expenses, or in not setting up an adequate maximum, or if the insurance charge isn't enough, we may lay our facts before the War Department and have it remedied.

MR. GREENE: May I ask a question Mr. Chairman. Is it your understanding that this plan will apply to munitions?

MR. PINNEY: This plan is to apply to munitions risks. There is a special provision in the plan which provides for an additional insurance charge for munition risks to be included in the so-called fixed charge. I believe there is a maximum of 2% additional charge that may be used on these risks, with further provision that if the Government is not satisfied, or if they can't find any carrier that is willing to write it at 2% additional, then the risk may be thrown open to competitive bidding. In other words, the Government has indicated that this is all subject to their review and acceptance of the need for the charge, but that they have been willing to go along with the companies up to a 2% additional charge on munition risks. We have given some thought to these munitions risks, and, of course, at first we think of the extreme hazard in connection with them. But our later feeling is that there is not such a tremendous hazard in these munition risks for compensation insurance or liability insurance, because of the way the modern plants are constructed, with the segregating of employees and other precautions. Whether 2% is going to be enough, I don't know. Of course, everything depends on the way the general experience of the risk would run. In other words, if you have $300,000 premium, and your normal loss ratio, say, on that $300,000 premium runs around 40%, you could absorb quite a bit of additional losses in a catastrophe and still be within the maximum on these cases.

The reason we cut the automobile and other liability rates 50% was, I think, that we all felt there was a distinct reduction in the hazard from a liability insurance standpoint. Many of these defense projects are isolated from the public, and in the case of automobile insurance, much of the equipment is used on the premises, and we felt there was a real reduction in exposure to hazard. Of course the companies to a certain extent are to blame for some of the impressions the War Department has had. During the scramble for business that preceded this plan, the companies went out and cut the liability premium very drastically, and the Government remembered the fact. When we suggested the 50% cut, they didn't think we were going too far; they thought we ought to go down to 5%.

MR. GIBSON: If you don't mind listening to me for another half minute, it seems as though our President at this time takes a very timely topic. While he was talking, I was looking at the galley proof page where he has a table of expenses for the calendar year 1940 in connection with this munitions plan. Looking at it from the point of the reinsurer, if the direct carrier is able to handle this on the basis of what is proposed in view of the experience shown here, it would seem that the amount to the reinsurer is going to be a minus quantity.

MR. GINSBURGH: We have discussed this munitions defense rating. One element hasn't been mentioned, and that is the question of suretyship, and is it not involved in the defense program? Has anyone anything to offer on that?

Are there any other questions or comments on this phase of the program?

MR. WAITE: Mr. Chairman, may I return again to the discussion on compensation. My understanding of the program proposed by the War Department and acted on yesterday in the National Council, is that manual rates are contemplated for compensation, subject to a 10% reduction in the insurance charge in lieu of experience rating modifications. Referring to Mr. Cahill's remarks, I have not personally been in favor of the previous program which contemplated a weighting or an arithmetic average of the experience rating modifications of the contractors, whether this produces results below or above manual, because I do not think that these jobs, whether involving manufacturing or construction operations, are necessarily going to follow along the course of the work that the contractor or manufacturer has previously performed.

Dealing further with rates, question has been raised as to the accuracy of the rates for munitions manufacturing. Many of you here know that those rates underwent a very thorough study in the National Council. The published manual rates contemplate favorable conditions, with loadings to be applied in the event that plant conditions do not follow certain standards. I assume that the rates as used in the War Department Rating Plan are manual rates, that is, the same rates that would apply even though the War Department Rating Plan were not in effect. There

may be some question as to the adequacy of the expense provisions under this rating plan. The statement has been made that insurance companies should be willing to go along with the Government with a pretty tight belt. Perhaps that means that we are contributing something from our expenses. However, I would not consider that the expense portion of the rate was related to reinsurance, as reinsurance involves losses rather than expenses. The insurance charge includes a provision to take care of the losses in excess of the maximum premium, that is, in excess of 90% of the standard premium. It is my understanding that the factors used to determine this amount are the factors in existence in the present Retrospective Rating Plan, which factors are considered to be adequate insofar as there are actuarial data to demonstrate their accuracy. Presumably it is from the insurance charge that the reinsurance premium would be paid. Do I understand that the groups that have considered this subject would be unwilling to share in stop premium insurance? It is likely that the reinsurers would ask the carrying company to participate, but would the reinsurers be unwilling to participate in the losses above the maximum—for a proportional share of the insurance charge?

MR. GREENE: Possibly, after all, if this business is going to be underwritten, of course maybe it isn't, but if it is going to be underwritten, I assume that any company that writes a risk believes that it is all right, barring the unforeseen, which would be a catastrophe.

MR. WAITE: That is right, absolutely right, Mr. Greene. We could approach the problem on the basis of what a proper rate would be for that coverage. I am quite sure on munition risks it would be considerably more than 2%. I put it that way. You say an insurance charge is there for the average risk.

MR. GINSBURGH: I am sorry it is getting so late. We want at least to touch on our third question. I hope we can continue discussion informally later, because it is a question in which I know many of us are intensely interested. I use the word intensely advisedly. It is a type of question which is provocative of thought. It doesn't bear directly on current issues, but it is

something that is causing us to think, and that may produce changes in the future. That question is—"As respects the liability lines, why not issue unlimited coverage as standard coverage, subject to limitation by endorsement in exceptional cases?" Mr. Barber, will you open the discussion.

MR. BARBER: A topic of this kind should be examined from three points of view; the policyholder's point of view, the point of view of the public, and the point of view of the insurance carrier. I have a few notes, some comments, and a number of questions that may be pertinent.

From the assured's point of view, the increased protection would undoubtedly be welcome, provided that the additional premium cost was nominal. The question naturally arises as to how much would premiums be increased if the limits were removed. I presume that a proponent of this form of coverage would probably refer to some such line as residence public liability. From an examination of the experience, we might find that the amount of losses paid on limits in excess of 5/10 may represent 1% or 2% of our total losses for 5/10 limits. Now unlimited coverage would sweep in losses over and above selected limits, and they might be worth possibly 2% or 3% or 4% more. Thus, it might be estimated that unlimited coverage could be written for some lines for less than 5% more than the cost of 5/10.

Here are a few points which might be covered in a longer discussion of this topic. Would some policyholders be paying for coverage under the proposal which was not needed, but which might be essential to other policyholders? Does the financial standing of the assured either rightly or wrongly have a bearing on the amount of liability settlements? Wasn't the $1,000 limit automobile policy designed with this situation in view? On the other hand, in the event of a serious claim, are not high limits essential to anyone regardless of financial standing? Another point: If you were the "exceptional case," requiring a limit in your policy, would you have grounds for complaint on the basis of unfair discrimination? Would this difficulty be overcome if the manual contained a schedule of discounts for specified limits?

From the point of view of the public: The public has taken an interest in unreasonable liability verdicts by enacting statutes

which limit the recovery for death in many states to some such amount as $10,000 or $15,000. Generally there is no limitation on the recovery for non-fatal injuries, but it may be inferred that the public is interested in keeping the cost of individual claims to a reasonable figure, thus perhaps helping along the cause for unlimited coverage.

An insurance carrier would be better able to satisfy large verdicts in excess of customary limits than would an individual assured. Therefore, from the standpoint of the claimant, the proposal has advantages. Would costly accidents undermine the protection of other lines of insurance by seriously weakening the financial status of some carriers? What has been the experience in connection with workmen's compensation where coverage for multiple accidents is unlimited? Would reinsurance satisfactorily answer this criticism? Would the practice of issuing unlimited coverage tend to drive business toward the stronger carriers? Has unlimited coverage been issued in any other country, England for example, and what has been the experience? I understand that some forms of liability coverage are not limited in England.

From the insurance carrier's point of view, there are a number of questions which occurred to me. How about the legal limit on the amount of insurance a carrier is permitted to assume? Would reinsurance overcome this difficulty? Would the unlimited coverage have any pronounced effect on the level of claim settlements? Today damages claimed often coincide with policy limits. Possibly if there were no policy limits there would have to be a closer evaluation of actual damages or costs. Is the simplification in administration detail and the consequent saving in expense which would result from the elimination of limits a material advantage from the Company's point of view? With 5/10 limits as standard, the underwriting of higher limits automatically receives consideration. If unlimited coverage were issued, is it possible that the unsatisfactory underwriting aspects of some risks might escape attention? Would the limitation of coverage of exceptional risks constitute unfair discrimination? Would it be subject to competitive abuse? Is this an impractical feature of the proposal set forth in this topic? Is the proposal better suited to some lines of insurance, such as private residences,

apartments and tenements, and possibly private passenger automobiles, than is the case with other lines such as contractors' public liability and elevator insurance? Is there any real need for making unlimited coverage apply universally since additional limits can be freely purchased today? In other words, is it not true that the present system is functioning satisfactorily in meeting the public demand for adequate coverage?

These are some of the comments which have occurred to me. I think the answers to many of them are quite obvious. There may be a basis for an interesting discussion in others of them.

MR. GINSBURGH: The time is limited, but perhaps there is time for one more comment on this particular question. Mr. Masterson.

MR. NORTON E. MASTERSON: Unlimited liability can extend in two directions. Liability can be unlimited vertically as to dollar liability or it can be unlimited horizontally as to types of hazards covered.

To make my remarks brief, I think there is a greater need for a horizontal expansion of coverage to include more types of hazards than there is any need to make contracts unlimited as to dollars of liability for present coverage. Changes in the court's attitudes on liability and the different interpretations revealed from judgments in various states tended to lead the companies toward the so-called comprehensive liability. Consequently, current conditions require us to expand horizontally to cover more phases of liability rather than unlimited dollar liability in the various types of contracts under which we now grant coverage. The future approach in studying this question should be toward more comprehensive liability coverage rather than of granting unlimited payment liability for present types of coverage.

MR. GINSBURGH: I hate to cross off this part of our program, because I think the last two speakers really started something.

MR. GREENE: It has been suggested that the present practice of issuing liability policies with standard limits of $5/10,000 be discontinued in favor of the plan of making the standard policy unlimited. If the practice were changed in this respect it would, in my opinion, be a certainty that claim cost would increase very substantially. This opinion, as far as automobile liability busi-

ness is concerned, is based upon the observation of actual experience. The assured would have to pay considerably more on the average for his coverage and of course the direct writing company would have to pay considerably more for excess of loss reinsurance. The experience above referred, and which removes the result from the realm of conjecture, has to do with a considerable volume of automobile business written for such high limits as to be virtually on an unlimited basis. The direct writing companies should have no doubt as to the increase in claim cost which would result from the suggested plan. The only interest of the professional reinsurers in this question would be, first, to counsel against what would seem to be a step in the wrong direction, and then, if unfortunately the step were taken, to make sure they obtain enough reinsurance premium to cover their substantially increased liability.

REVIEWS OF PUBLICATIONS

CLARENCE A. KULP, BOOK REVIEW EDITOR

Accident and Health Insurance, Edwin J. Faulkner. McGraw-Hill, New York City, 1940. Pp. 366.

Mr. Faulkner's book is the most complete treatise ever published on the subject of accident and health insurance. As one who has lived with the subject matter for many years, the reviewer at times has noticed that certain subjects weren't treated fully and others were left out, only to find in a later portion of the book that each and every subject has been treated intelligently, thoroughly and in a manner in which even the student of accident and health insurance can understand. It is extremely difficult to write both a text book for the student and a reference book for the expert. Yet Mr. Faulkner has accomplished both purposes. The student can obtain a thorough knowledge of the subject by a careful and detailed study. The expert can use many of the portions of the book for permanent reference, particularly the chapters on premium rates, reserves, claims, the law department, noncancellable insurance and hospitalization insurance.

Throughout the book are many statistical and historical facts of practical interest, which can be used successfully by home office employees or the men selling in the field. Mr. Faulkner has in addition taken several subjects and delved into them so exhaustively that he has made a permanent contribution to the past and the present of certain phases of accident and health insurance. For example, his chapter on non-cancellable accident and health insurance brings, briefly and concisely, a very clear picture of the business up to the time the book was written. None of us today knows what the future might bring in non-cancellable insurance. Perhaps a few years from now there will be a mad scramble for this business, and the availability of the concise facts of the past could be of untold value. In his chapter on hospitalization insurance the author has taken the subject from its very inception and brought it up-to-date. Although it is still an infant which may be destined to prosper or die of childhood diseases, there should be some readily available picture of its progress to date.

No reviewer should be too Pollyannaish, and part of his duties

should be to point out any possible criticism. Mr. Faulkner's book is "well nigh on to perfect"; nevertheless, he might have brought out some of his points more clearly had he occasionally used more of the case method. Reading the book will require the concentrated effort of the student and had more examples been given the mastering of the subject could have been made somewhat easier. From the standpoint of the salesman the example also is all important.

In Mr. Faulkner's treatment of hospitalization he is realistic and practical. Nevertheless he admits that there might be some merit in straddling the issue of the so-called non-profit hospitalization association. There is no doubt that these associations have been actually helpful to the insurance business in that, by free publicity combined with a halo of paternalism, they have brought out the rather dormant desire in the insuring public for the purchase of hospitalization and income insurance. However a thorough study of hospitalization reveals that, in the long run, the insurance companies can give the public more for their money than the non-profit hospitalization associations. Whether or not current hospitalization association underwriting is unsound, and the various corrective measures indicate that this may be true, the criterion of the benefit to the public must be on the long-pull basis. However, should the insurance business be on the fence on a plan that has written over $32,000,000 in premiums in 1940? The trend is especially disconcerting if we realize (1) that practically no taxes were paid by these associations despite the fact that they were using facilities paid for by taxation of insurance companies, (2) that with negligible exceptions no insurance agent received a penny's worth of remuneration on these $32,000,000 of premiums, and (3) that, again with essentially no exceptions, the $32,000,000 premiums were administered without the employment of any member of the insurance fraternity.

In summary, Mr. Faulkner's book is of real value to every one of us in the accident and health insurance business. It shows the result of many hours of research combined with a thorough knowledge of the business from a practical viewpoint. Without casting any discredit on previous ventures, Mr. Faulkner's book is by far the best and most complete.

ARMAND SOMMER.

Automobile Claim Practice, Victor C. Gorton. Rough Notes Co., Indianapolis, 1940. Pp. 233.

It is refreshing to realize that it is impossible for one to write of a subject without revealing his own character. Mr. Gorton has written a thorough exposition of the basic principles of automobile claim investigation and adjustment. Throughout the book he makes a plea that insurance companies realize that the services they render in investigation and the money they expend in the settlement of claims are in the performance of a trust obligation. He emphasizes the insurance company's duty, not only to its policyholders but to the public, to perform that trust ethically and honorably. An author who earnestly contends for such a conception cannot but convince his readers of his desire to explain in a straightforward manner the principles of casualty insurance that lead to a thorough and proper disposition of the underlying problems.

A section of the book is devoted to investigation of claims. The author stresses the great value of immediate investigation. He warns the reader that witnesses may forget or may be inclined to misrepresent the facts at the time of a trial long subsequent to the happening of the accident and advises the immediate taking of photographs of automobiles. These photographs will fix for all time the point of impact in collisions, the nature of the damage and to a certain extent the manner in which the accident happened. I believe his suggestion with respect to photographs is one of the most important he has made. If witnesses for a claimant at the trial should undertake to testify that the front end of the defendant's automobile collided with the plaintiff's automobile it is easy to realize how effective would be photographs of the defendant's automobile showing the damage near or at the rear end. Such photographs although not living witnesses would operate to destroy the testimony of any number of perjured, or to be charitable, mistaken witnesses. The author points this out very forcefully.

He also sets forth in careful detail every step that should be taken in the investigation of an automobile claim, whether it be automobile liability, collision or fire or theft loss. A careful reading of this portion of the book will be of great help not only to

investigators in the field but to home office executives having such work under their supervision.

On the subject of compromising claims, he has been equally thorough and has provided suggestions that should enable an adjuster to understand how to negotiate the settlement of any automobile claim. He has stressed the need of immediate settlement where settlement is indicated and the danger of allowing such claims to live and grow more serious when common sense demands that they should be terminated promptly. I believe this is one of the most vital principles of claim adjustment and one that is so often overlooked. The attitude of mind that permits dangerous claims to remain open naturally grows from the human and understandable inclination to put off the evil day. The author warns of this danger and explains its disadvantages. He emphasizes the fact that claimants must be treated fairly and that claims must not be settled for sums unreasonably below their real worth because such tactics lead to dissatisfaction and ultimately destroy good-will.

He opens up an interesting field of thought in suggesting that insurance companies give consideration to the idea that it might be beneficial to step in and pay all medical expenses for the treatment of injured claimants and furnish doctors to render medical services for the purpose of restricting or eliminating malingering and exaggeration and of reducing damages where liability is found to exist. He admits that there is danger connected with this procedure because it may be difficult for insurance companies to take such steps without appearing to admit liability. I believe that since companies have managed so long to obligate themselves to pay for medical first aid, a method can be devised by which they can pay all medical expenses and still leave open the question of liability. I am in agreement with the author in expressing this belief.

In addition the book contains valuable suggestions on investigation and adjustment of bodily injury claims as contrasted with property damage and gives excellent advice as to the difference in legal relationship between occupants of the assured's car and of the claimant's car. The rights of street pedestrians and minors as well as persons who have received fatal injuries are discussed.

There are careful instructions about waiver and estoppel and

methods of action are indicated by which they can be avoided. There are also suggestions to foster the establishment and maintenance of the proper spirit and cooperation between the adjuster or the adjusting attorney and the home office of the company.

The book is a complete analysis of its subject and it deserves a valued place in the libraries of all insurance companies and individuals engaged in investigation and adjustment of liability losses. I believe the reader will find that its principles apply not alone to automobile losses but to liability claims and law suits of every character, and that they deserve to be followed in all such lines of work.

FRED H. REES.*

* Guest reviewer.

Best's Fire and Casualty Aggregates and Averages. First Annual Edition. Alfred M. Best Co., Inc., New York City, 1940. Photo offset. Pp. xi, 145.

Whatever annoyance one may have felt on discovering that the Best annual *Casualty, Surety and Miscellaneous Report* of 1940 had dropped its useful section on *Comparative Tables* was dissipated with the appearance of the first edition of this new statistical compend. For casualty insurance it includes not only the old exhibits of individual company and multi-company underwriting results but expands these and adds long-missing comparable balance sheet and income statement materials. With parallel materials for fire insurance, for which both underwriting and financial analysis has been sadly defective even in Best publications, this new book fills a spot long and for the greatest part glaringly empty. *Charco Charts* and the *Law Comparative Tables of Casualty and Surety Insurance Companies* have done something to remedy this lack in our field (reviewed in these *Proceedings,* Vol. XXIV, Part I, pp. 177-180; Vol. XXVI, Part II, pp. 393-6, respectively) but neither fills nor attempts to fill the role of this new publication. At the same time *Charco* gets credit for having broken ground in more than one sector now occupied by *Aggregates and Averages.* The really remarkable success of the *Charco* publishers in compressing large quantities and long periods of balance sheet materials can hardly have escaped the attention of Best. *Charco*

emphasizing the individual company proved that much could be done in small space that had never even been attempted; Best has extended the analysis to include not only detailed individual company results but long-term averages classified by type of carrier and by line of insurance. *Charco,* devised largely as a sales aid, uses more graphs and shows less original data, particularly for previous years; Best with more space and scope and with a different clientele adds to its traditional statistical tabulations a number of extremely interesting graphs particularly of time series. While in large part, the largest part perhaps, the publications do not compete, ideas have a way of getting into general circulation. There is no less credit to Best but credit must also be given to *Charco.*

A review of a book like this must restrict itself to a bird's-eye look from afar with an occasional peek through a high-powered glass to give verisimilitude to the perspective. The book places approximately equal emphasis on trends and on detailed latest-year results; on broad averages for a decade and for various types of companies and on specific information for the individual carrier. Fire graphs for example cover as many as 50 years, casualty as many as 35. Balance sheet, income statement and underwriting results are given not only for the aggregate or average company but classified by type of operation: for example aggregate stock fire balance sheet data are classified as foreign-owned, automobile, U. S. branches, miscellaneous; mutual fire as agency writing at deviated rates, agency at tariff rates, direct writing at deviated, direct writing at tariff, perpetual, associated factory, mill. Income statement and movement-of-surplus data for stock fire companies are classified under 10 heads; for mutual fire companies under 6. The number of sub-classifications for casualty company exhibits is:

	Classes of company
Stock casualty	
Balance sheet	4
Income statement and movement-of-surplus	7
Mutual casualty	
Balance sheet	4
Income statement and movement-of-surplus	4

A uniform system of analysis (as far as the data themselves permit) and of presentation makes comparisons between stocks and mutuals and between fire and casualty business the more significant. (Data for reciprocals and Lloyds are limited to balance sheet figures for fire companies.) Practically every item of these aggregate statistics is new to Best publications. The casualty student welcomes particularly the financial statistics given in the Best annual *Reports* only for individual companies.

The new emphasis in Best has luckily not resulted in less attention to the individual company and particularly to the strongest feature of the old annual *Casualty Reports:* the detailed analysis for the latest year and for a period of individual company and multi-company results by line of insurance. The old section headed *Comparative Tables* is included *en bloc* and continues for 1939 and the decade ending 1939 an exhibit of underwriting results for which there is no parallel in this country, and as far as this reviewer knows nowhere else including Germany, where statisticians run riot. This book generally is much more complete for individual company data for casualty than fire companies, as the following exhibit shows:

	Fire		Casualty	
	Stock	Mutual	Stock	Mutual
Classification of admitted assets.....	yes	yes	yes	yes
Analysis of underwriting disbursements.....	no	no	yes	yes
Analysis of underwriting results by line.....	no	no	yes	yes

In part these fire lacks are due to the nature of the business, in part to the deficiencies of the statistical raw materials which are due in turn in part at least to the antiquated reporting of fire company results. It will be interesting to observe to what extent this new publication will contribute directly and indirectly to better and more meaningful information on fire company operations, information far too long obscured by a combination of extreme *laissez faire* company policy and something less than close attention to detailed fire results by public officials.

For the combination of fire and casualty results, the addition of graphical presentation (generally accompanied by the original data) and the new balance between underwriting and financial

data Best is to be congratulated. Some day perhaps official reports will furnish this wealth of current and comparative materials. Until that day comes Best seems likely to be our principal reliable source of comprehensive casualty (and fire) statistics.

C. A. KULP.

College Plans for Retirement Income, Rainard B. Robbins. Columbia University Press, New York, 1940. Pp. v, 253.

Dr. Robbins' second survey of retirement plans for colleges seems his best writing to date. All 3 of the sections will be valuable:

(1) The meat of the book, Part II, for the full discussion of the problem of retiring college teachers, college administrators and non-teaching employees.
(2) Part I, which gives in some detail brief analyses of a considerable number of individual college retirement programs.
(3) The Appendix, which alphabetically lists the institutions which have used Teachers Insurance and Annuity Association plans, the institutions having contributory plans using contracts of other life insurance companies, the half-dozen institutions having contributory plans which accumulate their own funds, the plans included in broader retirement systems for public employees and religious workers, the non-contributory plans, the 8 institutions having Carnegie pensions only, and the longest list of all, those institutions for which Dr. Robbins can find no record of any formal protection, divided between those where he has reason to believe that there is no plan and those for which he has no information.

As against Dr. Robbins' use of the World Almanac we have consulted the Federal Office of Education, which includes as institutions of higher learning normal colleges and certain other types of institution which Dr. Robbins has omitted. There is some evidence that certain retirement programs are functioning among a few of those institutions for which Dr. Robbins found no information.

The study is straightforward, understandable and mature. It carries to the reader the conviction that the author has written from a sound experience with the subject he is covering and with-

out claiming a simplicity which is necessarily lacking. Since in discussing retirement plans a full treatment cannot ignore either individual attitudes and plans or today the field of social insurance protection, these complementary areas are neither omitted nor brought into discussion too completely. The following elements of his discussion particularly interested this reviewer:

(a) The ways in which failure to retire men has seriously hampered the work of an institution.
(b) The problems which abound in handling invalidity retirements.
(c) The differences between the individual contract and the group contract.
(d) The awkwardness of giving cash surrender values and of failing to provide for considerable service periods any eventual old-age incomes.
(e) The high cost of any retirement allowance, particularly with current interest rates and current mortality.
(f) The close interrelationship between the period of contribution, the amount of that contribution and the amount of the retirement allowance.
(g) The problem of investments for individual institutions and for the urban community. (Since many colleges are to some extent supported by tax funds, the whole subject of college retirement plans impinges on the subject of state and municipal retirement programs.)

The fact that Dr. Robbins' table on page 4 shows that more than half of the institutions reviewed seem to lack any formal program whatever emphasizes the practical value of this type of summary. The majority of the colleges of the country need some guidance in providing for retirement allowances for their teaching and non-teaching employees. Here in a temperate, thoughtful and helpful discussion has been embodied a brief survey of what the college needs to consider in moving from no retirement program to some retirement program.

While the book is not a sales manual for the Teachers Insurance and Annuity Association, it will doubtless increase the prestige of that organization. The reduction in the slight subsidy which has heretofore existed will not of itself greatly change the overall costs of the Association. The expectation, however, that the staff and the institution together are expected to pay the full

share of costs should attract some of the colleges which might heretofore have leaned toward the commercial insurance company. As other insurance companies further recognize the importance of these retirement plans such special advantages as are present in dealing with a company organized for the particular purpose of handling college programs will be increasingly appealing.

W. R. WILLIAMSON.

The Compensation of War Victims. Studies and Reports, Series E, No. 6. International Labour Office, Geneva, 1940. Pp. 91.

A nation regularly maintains military and naval forces on a regular footing, with officers and men who enter the calling voluntarily and as a regular employment. This employment carries with it a right to a pension at regular proportion of pay at the completion of the term of service, and disability or death benefits where these arise out of the service, also related to the pay.

Where however in time of war, citizens are drafted for military or naval service, they undergo a loss by reason of being compelled to quit their regular vocations, to devote time and strength to a special and exalting service at a remuneration often far below their normal earnings, and at the end of their service to hunt a job in a world of which non-combatants have taken possession, and more likely than not distraught with post-war depression or reconstruction. If killed or injured, the loss to themselves or their dependents is measured, not by their military pay, but by what they would normally have earned but for the death or disability.

All the great nations have methods of compensating conscript soldiers. These methods are based on a number of different considerations. The consideration may be a reward or bonus based on the fact of service and not undertaking to measure the individual loss involved. It may be an expression of a special social solidarity: an obligation arising out of the war to equalize the sacrifices of citizens and recompense individuals whose injuries and losses exceed the sacrifice required of all members of the community. Or it may be the recognition of an obligation on the part of the state to indemnify all suffering loss by reason of its acts to the full extent of the loss provided this is materially possible.

Some of these considerations apply also to the granting of benefits in cases where civilians are killed or injured—an incident in this war most horribly frequent.

This report contains a study, first of the general principles of compensation; second of the compensation plans in force in France, Germany, Great Britain and Italy. The subject matter runs into detail in a fashion that cannot with any profit be abbreviated. It is of vital interest in view of the fact that the problems of these nations are now ours. It seems inevitable that the course of war will bring about an increased degree of national solidarity: that private activities will be ruthlessly coordinated in the interests of the huge effort the nation is making to keep itself secure and maintain its integrity; that private wealth will be heavily drained by war taxation; and that national integrity and unity in the common cause will render necessary some equalization of the sacrifices of citizens, some just indemnification of those who are required to break the continuity of their careers, forego private gain and court the hazard of disablement or death. It is necessary too that the method of doing this be sound, systematic and just, both to the persons directly concerned and to the nation. For this the examples and experience of other nations, up to date more sorely tried than ourselves, are of great importance, and this report therefore well worth our study.

CLARENCE W. HOBBS.

Digest of Workmen's Compensation Laws of the United States and Territories. Annotated. Sixteenth Edition. Association of Casualty and Surety Executives, New York City, 1939. Paging non-consecutive.

This useful publication, unique in our casualty insurance literature, has been improved even further with the 16th edition. From now on the *Digest* will be in loose-leaf format, the Association supplying the amended pages as they are required. The first supplementary pages issued since publication for example analyze the new Arkansas law.

The *Digest* is particularly valuable for its compact and conveniently comparable analyses of American state and federal

workmen's compensation laws and decisions, arranged first by jurisdiction, in turn by subject-matter. The lawyer, the insurance executive and the student, aided by uniform subject-matter classification (No. 6: *employments covered;* No. 8: *extra-territorial effect*), have quick access to a truly encyclopedic array of statutory and judicial materials. *Injuries covered* for example requires 4 close-packed pages in the California section, over 5 in Pennsylvania, over 16 in New York. The *Digest* is not a substitute for a legal text or a close examination of the laws and cases but it is a superb first step even for the specialist because it is up-to-date (or as nearly up-to-date as published materials permit).

The *Introduction* presents in addition to a considerable range of historical data a series of summaries, tabular and other, of major features of the statutes. Here the *Digest* reverses the plan of the main section of the book and pulls together by subject-matter materials from all jurisdictions. Not as complete as the main section, it also offers a very useful short-cut.

It would be impossible to prepare a compendium of this scope and heft without errors of commission or omission. This reviewer, using the *Digest* intensively, has noted very few of either. One does not cavil with the telephone directory because occasionally a name is missing or appears misspelt, and in any case the odds are that the directory version of a name is more accurate than the impressions of the reader. Like the directory—the standard of accuracy is a high one—the *Digest* can be revised to catch the occasional mistake.

C. A. KULP.

Food, Teeth and Larceny, Charles A. Levinson, D.M.D. Greenberg, Inc., New York, 1940. Pp. viii, 232.

The dentist is a gentleman whom one resorts to, not from choice but from necessity; who causes one considerable pain and expense; and who is wont to voice his views at exactly the time when the patient's mouth is full of hands and instruments, and is in consequence in no position to talk back. A dentist who puts himself in print therefore has deserted his place of vantage, and must expect something more than mumbling acquiescence or pro-

test. The book has an intriguing title; it is not long, is passably well written and is set up in type mercifully large. It touches on a subject in which casualty insurance companies of late years have been compelled to take an absorbing interest: the extent to which they and their clientele are being victimized by fraudulent claims for personal injury. This book deals with claims of this class based on alleged injury from foreign substances in foods. It is inherently possible enough that foreign substances, such as stones, nails, glass or disgusting or unsanitary additions should in the process of preparing for sale, marketing, cooking or serving, find their way into food products of various kinds. If the substance is hard or cutting, and the object is small, a broken tooth, a lacerated gum or even more serious injury might result. Some injuries, the author states, are bona fide. But many are fraudulent and there is a class of racketeers, with attendant corps of corrupt dentists, medical practitioners and lawyers, that produces claims and the evidence thereof with the greatest ease; also petty grafters who seeing how easy it is to get a claim settled are tempted to repeat.

The author makes out a good case for more and better dentists, skilled in diagnosing this type of injuries and in separating genuine cases from cases possibly, probably or certainly fraudulent. Greater use, he thinks, should be made of examining dentists, with preference for those who make good witnesses, and he urges that dentists perfect themselves in the art of preserving valuable evidential data and of testifying in court. He discusses certain technical points, notably the force exerted in biting and the force necessary to fracture a tooth, incidentally enriching the writer's vocabulary by the mouth-filling word, gnathodynamics. As to the policy of insurance companies with claims of this character, he thinks it ought to be a deal stiffer than it has been in the past, and is apparently of opinion that the racket has proliferated hugely because of the lavish way in which insurance companies settle claims. He is of the opinion seemingly that the most effective work in curbing the racket has been done by trade organizations and individual concerns and prints *in extenso* an article by Mr. Hathaway of the Hathaway Bakeries, Inc., who animadverts on the too great willingness of attorneys to settle claims, and states that his actual cost of handling this class of claims, includ-

ing attorneys' fees, court costs and adjustments, was less than 4 per cent of what it would have cost to carry insurance.

These statements can hardly be discussed without some exhibit of facts. The casualty companies are far from indifferent to the peril of fraudulent personal injury cases and have set up bureau machinery to deal with them. To be sure, this class of cases is one in which many insureds want settlements made in order to avoid unsavory publicity and it is inherently quite possible that this causes many minor cases to be settled which should properly be resisted. Some work is probably necessary to educate the insured to resist fraud on principle and to be willing to take a little adverse publicity in the good cause.

The fact that the author has seen fit to reproduce Mr. Cahill's excellent paper on product public liability should recommend him to the members of this Society. His work should be of interest to all who handle this type of claims.

CLARENCE W. HOBBS.

Liability for School Accidents, Harry N. Rosenfeld. Harper and Bros., New York City, 1940. Pp. xvii, 220.

The development of the district public school has presented the community with many new problems. In contrast to the equipment of the little red school house, many of the new schools are equipped with gymnasiums, swimming pools, shops and studios. Numerous schools also operate large athletic studiums. In addition school boards provide bus transportation for pupils to and from their homes. In view of all these school activities it is not surprising that students have been injured on school property and other places connected with schools. On account of accident the parents of an injured student may incur medical and other expenses. An attempt is usually made to sue the school board in order to recover for the injury to the child and the various expenses incurred by the parents. In different part of this country insurance agents have sold liability insurance to school boards in order to protect the school district against legal liability on account of accidents to school children and others. These agents and insurance company executives will find a thoughtful and thorough study of negligence cases involving school boards described in court reports in this book.

An analysis of these cases will disclose that the right if any of the injured to recovery from the school board is subject to the following different legal theories: (1) In some states the school board cannot be held liable for negligence. Some reasons advanced for this theory are: (*a*) the school board is immune in a tort action, (*b*) the school board has no funds to make necessary payments. (2) In some states by statute the school board is required to recompense a teacher who is held liable for injuries resulting from negligence. (3) In some states the school board is held liable by peculiar judicial deviations from the theory that the school board is not liable in negligence. For example an injured person may be permitted to recover against the school board if the school board has purchased liability insurance. However the amount of recovery is limited by the amount of insurance available under the insurance policy. (4) In some states the school board is held liable in negligence, as is any citizen of the state.

Given these varying theories it is not surprising that the author reports a case in which a board of education sued to recover the premium paid on bus insurance by the members of a previous board. The court permitted recovery on the theory that the board of education was not liable for injury and could not become liable by the purchase of insurance! In some states the attorney general has ruled that school boards cannot purchase insurance without an enabling legislative act.

Mr. Rosenfeld believes that the chaotic situation concerning the rights of pupils to recover in negligence should be clarified so as to give the child a right to sue the school board. In addition he recommends and outlines a carefully devised and supervised accident-reporting system. He suggests that parents should sign a permission slip for certain school activities. This procedure may reduce the liability of the school board. At any rate he regards such procedure to be good school administration.

The author discloses the growing tendency for legislative action to permit the purchase of liability insurance by school boards. The purchase of liability insurance has been challenged on the theory that the school board should aim to prevent injury to children and not use an insurance policy to evade responsibility. In the reviewer's opinion it is strange to see ideas advanced which

fail to recognize that although the utmost care is taken injuries will occur in connection with school activities and that some form of insurance should be used to meet possibly serious financial costs. Incidentally the purchase of liability insurance has also been criticized on the theory that it is financially inadvisable.

The author proposes forms of liability coverage if such insurance is purchased by school boards. He apparently believes that clauses should be used in the policy covering certain specific types of accidents and suggests specific enumeration of employees who would be covered if suit were brought against such employees or against the school board due to the employment of such employees. These suggestions do not seem to be consistent with the present practice of insurance companies of issuing a policy with comprehensive coverage which would protect the school board under the various circumstances cited by the author.

There is a discussion of athletic protection funds which have been established to protect injured school athletes. In some states these funds are not subject to state insurance supervision and there is an indication that these funds are not based on actuarial computations in Mr. Rosenfeld's statement that: "Where funds have been insufficient, contributions were made by the sponsoring state athletic association." Incidentally even though the injured athlete has been paid under this plan, suit can nevertheless be brought against a teacher if the teacher's negligence caused the injury and suit were permissible by legal interpretation or by legislative act.

The author limits the right of the school child to recover for accidents to cases in which the school board has been negligent. The reviewer does not so see why this right should be dependent on the antiquated theory of negligence. Even if suit can be brought against the board there is the possibility of denying recovery if the injured child himself has been negligent. This places an undue burden on the child and parents. In order to remove all doubt concerning the right to recover there should be a clear-cut statement giving the pupil that right by legislative enactment. Why should not the legislatures recognize that a child who has been injured should be compensated for injury regardless of negligence? Should not school accidents be considered on the same basis as work accidents? Many schools have

machinery on their premises available for the use of children which is as hazardous as machinery found in factories. It would therefore be an interesting experiment to enact a pupils' compensation law to meet the problem. With the passage of such an act each school board would have to pay a premium to meet the cost of compensation insurance. Maybe some school boards might become seriously interested in an adequate safety program to prevent the injuries to pupils and thus reduce the cost of insurance. The progressive school board under those circumstances could obtain adequate help from insurance companies and local agents trained in accident prevention work.

S. B. ACKERMAN.

Mathematics for Actuarial Students: Part I—Elementary Differential and Integral Calculus; Part II—Finite Differences, Probability and Elementary Statistics. Harry Freeman. Cambridge University Press, England, 1939. Pp. viii, 183; xiii, 339.

These two volumes constitute a revision of the author's *Elementary Treatise on Actuarial Mathematics* published in one volume in 1931 and familiar to all actuarial students since that time as the most widely used text in the field of finite differences. The material on trigonometry and the infinitesimal calculus has been separately published in Part I of the revised text because the Institute of Actuaries recently made the examination on these subjects a preliminary test to be passed prior to candidacy for the standard Institute examinations. In Part II of the revised text are included the sections on finite differences and probability together with a new section on statistics. The resulting order, with finite differences succeeding rather than preceding the infinitesimal calculus, has always impressed the reviewer as being the more practicable from the point of view of instruction, even though it may not follow the rigidly logical development. During the past year, it may be noted, the sequence of these subjects was reversed in the syllabus of examinations for the Casualty Actuarial Society, finite differences now being listed after the infinitesimal calculus and including the common material on approximate integration.

Since finite differences is the only subject for which the Freeman text is now cited as the principal reference in the syllabus of the Casualty Actuarial Society, it will be proper to devote this review primarily to the finite differences section. The cardinal value of the original text lay in the completeness of its treatment of this particular subject and in the abundance of excellent problems under all topics throughout the book to be worked by the student. That statement is equally true of the new edition. No other elementary book which covers finite differences at all adequately is available. Extensive revisions have been made to reflect the reversal in the order of development of the subject matter, to simplify or to clarify old material, and to introduce new developments several of which first saw light in papers delivered before the Institute. The attention of the student who is accustomed to the old text should be directed to the revised notation used in the treatment of divided differences and to the new interpretation attached to the use of a negative exponent in the factorial notation. The chapter on interpolation with unequal intervals has been almost completely rewritten and greatly improved. Of the other chapters those dealing with central differences and inverse interpolation have benefited most by the revision. The emphasis on the respective formulae are more nearly in accord with their relative importance than previously.

The reader who is not familiar with the *Journal* of the Institute of Actuaries will be particularly interested in Chapter VIII wherein are presented Aitken's general theorem for polynomial interpolation, the same author's methods of interpolation by cross means and Comrie's "throw-back" device for shortening interpolation work. The cross means methods are especially noteworthy because of their adaptability to machine calculations.

The author continues his practice of including throughout his discussions copious references to more extensive treatments along the same lines in scientific journals and in other books.

Despite its comparative excellence in the field the Freeman text is subject to one very serious disadvantage when considered in the light of the needs of American students. That disadvantage cannot in all fairness be expressed as a criticism because it derives from the fact that this text was prepared principally for use in the classes of actuarial students conducted in England

under the auspices of the Institute. That is, it was written to be used as a classroom text. The needs of the average American student are distinctly otherwise; as a rule he studies finite differences, not in the classroom, but by himself with little if any assistance. The clarification which has been introduced into the revised edition makes it more suitable for the individual student than the original edition, but in various sections a too sparsely elaborated development of material and a superlative terseness in exposition are still sufficiently in evidence to preclude the revised text from fulfilling satisfactorily our requirements in this country. Further, and this is of particular concern to the student working alone, the author has not eliminated all of the lamentably numerous errata that crept into the original edition, particularly in the answers to the problems. When a student is working unaided his difficulties are multiplied if he cannot know when he has arrived at a correct answer.

For the following list of errata in the text I am indebted to Professor Cooley of New York University who has also most kindly cooperated in the preparation of the list of corrected answers to problems. All of the answers listed have been checked by at least one individual working independently of the reviewer; only the problems in the finite differences section are represented.

P. 54, 5 lines from bottom: The last two terms on the right hand side should contain $\phi(0)$ instead of $\phi(x)$.

P. 143: The exponent of $\Delta^3 u_{-2}$ in the lozenge diagram at the top of the page is missing.

P. 151, line 10, formula (2): Substitution in u_x' should be $x = 1$ instead of $x = 0$.

P. 151, line 11 should read: Let the third degree curve through u_0 and u_1 which has its slopes at these points given by (1) and (2) respectively be

P. 192, line 8: h should appear in the denominator of each fraction, whereas it is shown in the denominator of only the first.

P. 192, line 10: The denominators of the 2nd, 3rd and 4th terms respectively should read 2, $12n$ and $24n$ instead of $2n$, $12n^2$ and $24n^2$.

P. 317, Ex. 20: $a + 4$ should replace $a + x$ at the top of the summation sign in the definition of w_a.

Corrections in the answers to problems are as follows:

Chapter II:

Ex. 17: 14.73659

Ex. 18: 3.706 & 3.731

Ex. 19: 5280

Ex. 28: 58836

Ex. 29: Values of u_x from $x = 6$ to $x = 12$ should be 7.72, 9.50, 11.46, 13.60, 15.95, 18.52, 21.32. These answers fail to cross-check by one unit in the second decimal place, but the answers in the book though extending only through the value of u_{10} clearly are much further from cross-checking.

Ex. 31: $u_9 = 80.4$

Chapter III:

Ex. 3: 2.8168

Ex. 10: 20.45

Ex. 11: .162

Ex. 23: $(x - 3)(x - 4)$

Chapter IV:

Ex. 6: First approximation gives 2.85807

Ex. 12: 2290

Ex. 14: 4.033

Chapter V:

Ex. 1: 2.9

Ex. 2: 13.2

Ex. 3: 2.018 under part (i)

Ex. 6: The answer given is obtained by Lagrange's formula, but quite different answers are obtained by other methods of solution.

Ex. 12: 3.092

Chapter VII:

Ex. 11: .108

Ex. 23: 3.9568

Chapter IX:

Ex. 9: 199 sq. in.

Other criticisms which might be made of the finite differences section are minor in character. For example the inverse application of the method of detached coefficients might have been introduced to better advantage with the direct application in the first chapter rather than so much later in the chapter on summation. No problems in osculatory interpolation have been included. Henderson's formula is mentioned only in passing. The question of significant figures and rounding is handled in a 5-line footnote: that a number of the answers to the problems are wrong by one unit in the last significant figure and that the inaccuracy can in some instances be traced to improper rounding may be mentioned as evidence of the importance of elaborating upon these particular rules. One could desire a more thorough-going treatment of the subject of remainders under the various formulae, but possibly the scope of the book does not properly permit extension in this respect.

The section on probability in Part II remains noteworthy particularly for the abundance of problems at the end of the chapter. The section on statistics will be of little interest to the American reader. The material therein is inadequate for the needs of the students in the American actuarial societies.

Part I of the text has been very little revised, most of the changes being made to reflect the fact that this section now precedes the section on finite differences. Certain minor defects in the original text have been corrected. Thus on page 22 the term "polynomial" is introduced; in the earlier text this was called "parabolic function," a term not in general use. On page 32 the confusion between series and sequences in the earlier edition has been eliminated. On page 34 limiting conditions for the value of x have been added in the discussion of the exponential function. The many errors in the answers to the problems have, for the most part, been corrected although there are still erroneous answers even among those revised, as for example the answer to problem 24 on page 89.

Whereas the section on finite differences has virtues which establish it as superior to other elementary texts in that field, the same cannot be said for the section on the infinitesimal calculus. The explanation of this statement lies in the fact that there are available both in England and in America several well

written and satisfactorily complete texts on the latter subject but not on the former. The hiatuses which make this book difficult reading in spots may be illustrated by the discussion of $d/dx \sin x$ on page 48, where there is no indication of variation in solution according to quadrant; because of this omission the author himself is led into difficulties on page 108 in discussing the inverse operation. Although the erroneous statement on the latter page was pointed out in the T.A.S.A. review 9 years ago it has not been corrected in the new edition. As another illustration may be mentioned the development of Leibnitz' formula on page 52 with no comment there or previously on the extent to which the D-operator obeys algebraic laws. In Chapter V the student would be greatly aided by hints on how to obtain the minima and maxima of implicit functions; problems of this type are given at the chapter's close and are favorites with examination committees in the actuarial societies. Partial differentiation, which provides a definite mode of attack on such problems, is not introduced until the following chapter and even there its application to such problems is not mentioned.

The importance of the Freeman text in the field of actuarial mathematics cannot be questioned. The section on finite differences in particular has stood alone in filling admirably the most grievous gap in this mathematical field. The reviewer, with full realization that the text was prepared for class use, has attempted to indicate the disadvantages of the book from the point of view of American students. It is to be hoped that a text on finite differences meeting the needs of American students will be forthcoming in the near future. The situation is the more urgent because of the war emergency with the consequent strain on transportation facilities. As soon as a text appears on finite differences written with anything approaching the clarity of the average American college text on the infinitesimal calculus there is no doubt that it will be welcomed by the actuarial societies in this country. Meanwhile the excellence of Freeman's presentation stands as a challenge to the preparation of such a text.

T. O. CARLSON.

The Modern Fire Underwriter, Charles F. Rupprecht. The Spectator, Philadelphia and New York, 1940. (Single volume.) Pp. Part I, xi, 114; Part II, vii, 334.

On first reading this volume presents to the casualty actuary and underwriter a startlingly new and thought-provoking idea. On further reflection some of the questions subside but some remain.

Mr. Rupprecht admits that many take part in the underwriting of a fire insurance company but holds that "only the person who makes the final decision may properly classify himself as an underwriter." He defines as the decisions to be made by the underwriter, the acceptance or rejection of the risk and the setting of the net line limit.

In Part I are 31 chapters some of less than a page. Moral hazard is discussed in 4 pages, physical hazards in 3, hazards of occupancy in 4! Obviously all that can be done in such space is to indicate the general meaning of the terms and the fact that these types of hazard must be considered by the underwriter, and to give some idea of sources of information. Indeed in his introduction the author stresses the need for the ideal underwriter of a broad educational background in the physical sciences as well as in human nature and many other things. To the subject of rates he devotes a little over 2 pages! Apparently he does not regard the making of rates as within the province of the underwriter. They are one of the given factors in this problem. (After this statement probably most members of the *Casualty Actuarial Society* will hastily order a copy and see that it reaches the underwriter's desk.) "The importance of rates in underwriting and their effect upon the underwriter's judgment of the acceptability or degree of acceptability of a risk cannot be overestimated." By degree of acceptability the author appears to mean the net line for which the company may be committed.

Part I of the book discusses general matters leading up to the proposition that the profit or loss of a fire insurance company depends primarily on its line-fixing policy and that therefore the line to be set on an individual risk should be arrived at by a careful systematic analysis of its peculiar hazards. Part II provides basic material for the analysis. To those acquainted with life

insurance, workmen's compensation insurance and similar lines, where variation in the hazards of individuals is reflected in the rates, it is this thought, that variation in hazards of individual risks in the same class may be taken care of by variation in the line limit, that is startling.

There is however apparently this difference between fire insurance and the lines with which we are familiar that seems to account for this possibility: acceptable individual risks within the same class differ little in respect to ignitability (which corresponds to our accident frequency) but differ perhaps widely in the possibility of sustained combustion (corresponding to accident severity). If the rate for a class is not *grossly* inadequate and if the line is set small enough to exclude heavy losses the premium may be adequate for the risk assumed, may even show a margin of profit.

This reviewer has not sufficient familiarity with actual fire hazard to feel qualified to pass judgment on the system of analysis for determining line limits. One or two points do stand out. The scheme provides for an increase in the acceptable line if the policy contains an average clause. Since the average clause is a device for dealing with partial losses and has no effect when the loss exceeds the limits of the clause, the reason it permits a larger line is not obvious. An important element in the scheme is the loss ratio on the class. If low, a higher limit is set than in the reverse case. A persistent low loss ratio however would seem to indicate too high a class rate. Obviously such business is safe (within reasonable limits) and profitable. If profit is the only motive perhaps the point may be passed without comment. But this reviewer questions whether carrying the profit motive to that extent is wise in this day and age. Will not the fire insurance business better serve the public and its own long-run interests by so correcting rating plans as to avoid low loss ratios for any considerable classes?

To the best of this reviewer's information and belief the technique of fixing of lines has been regarded more or less as a trade secret, a personal skill to be guarded as an asset. Whether or not one agrees in all respects as to the items to be considered and the proper influence of each, this book should be welcomed as a step toward more open and scientific dealing with the problem.

A. H. MOWBRAY.

Odd Numbers or Arithmetic Revisited, Herbert McKay. The University Press, Cambridge, 1940. Pp. 215.

Any one who takes the time and trouble to revisit arithmetic with Mr. McKay will discover that it requires little time and no trouble. *Odd Numbers* is a thoroughly enjoyable review of elementary principles of mathematics, mainly as delimited by arithmetic proper but overlapping to some extent into algebra, geometry and trigonometry. While the author's style is simple, humorous and extremely readable the discussion always rests firmly on sound mathematical grounds. Even those who have never subscribed to the heresy that all forms of mathematics are dull are likely to find a new and heightened interest in many of the familiar subjects treated by Mr. McKay.

In a delightful chapter entitled *Weights and Measures,* the author presents a spirited and persuasive defense of the English system as compared with decimal systems. In the matter of coinage even the 21 shilling guinea is upheld, this coin being regarded by Mr. McKay "as a very handsome gesture on the part of commerce toward the arts and professions." He would be very sorry to have his payments reduced from guineas to pounds, "even though every guinea I received must be a stab through the heart of a pedant." As for the metric system which was based upon "perhaps the most unscientific scientific report ever published," the survival of this innovation is attributed to several pieces of quite unmerited luck, including the facts that the ten-millionth part (approximately) of a quadrant of the earth's circumference (measured along the meridian of Paris) turned out to be not greatly different from the convenient yard, and that a thousand kilograms happened to be close to a ton. Mr. McKay's preference for the English system is based however upon its flexibility and convenience in commercial application and he implies that a universal precise standard, such as the metric system, may be desirable for scientific purposes.

Another excellent chapter is that dealing with *The Delusive Average.* Averaging is the most popular of all arithmetical processes, perhaps because of the simplicity of the method: "you merely add a few quantities and divide the sum by the number of quantities. Even textbook writers do not quite succeed in

making the process difficult. They do their worst, but the method remains obstinately simple." The popular determination of averages has not been matched however by a popular appreciation of their significance or lack of significance, and Mr. McKay focuses some common-sense observations on this situation. The reading of this chapter might profitably be made a prerequisite to courses in elementary statistics.

One of the final chapters throws interesting light on the various methods employed in constructing ingenious mathematical problems of the type in which English text-books seem to excel. The selection of basic mathematical facts and the expression of these facts in innocent sounding language carefully designed to hide them is illustrated by new examples as well as by several old favorites. This chapter demonstrates that the construction of such problems is more difficult—and more fascinating—than their solution.

OTTO C. RICHTER.

The Principles of Surety Underwriting, Luther E. Mackall. 5th Edition. Spectator, Philadelphia, 1940. Pp. xix, 387.

The latest edition of Mr. Mackall's book on the principles of surety underwriting is, to the reviewer, a formidable affair. First appearing among the archives of the business in the historic year of 1914, it has since undergone 4 separate transformations, each reflecting the subject in the light of changed conditions and the author's maturing experience. It contains in brief a comprehensive catalogue of bond forms and a relief map of the ground which the successful underwriter must cover. In fact, as a *vade mecum* to the neophyte and to the junior underwriter, it contains almost everything except a time-table of loss expectancy. But it is as difficult to review as a cook book.

Perhaps the chemistry of the kitchen is no more elusive of lay interpretation than the sound thought processes of the underwriting committee. We all know that certain edible ingredients, properly measured and mixed and exposed to heat of stipulated degrees, should produce palatable results with no serious after-effects on the consumer. But we also know that no two cooks applying the same culinary formula will arrive at precisely the

same result. The elements of experience, interpretation of conditions and a "feeling" for the task at hand have marked bearing on the successful outcome of the venture. Just so the controllable outcome of the underwriter's assumption of liability does not and cannot rest on a mere descriptive analysis and formula.

The successful underwriting of fidelity and surety bonds is nothing but the application of sound business judgment seasoned by well-digested experience, not only to the facts at hand but to *all* facts pertinent to the case which can be adduced and interpreted by the underwriter. This is not a business of formulae; it is a business of judgment, of objective appraisal of facts and conditions, of anticipation of those various and unrelated hazards which might adversely affect the desired outcome of the undertaking. To incorporate such basic principles within the covers of a book is, to this reviewer, an impossible task. But Mr. Mackall attempted it many years ago, stalking the subject from the catalogue-formula side rather than from the basic philosophical side, and that he has met with popular success is attested by the fact that his work has been a best seller among the new recruits for more than a quarter of a century.

To return to the kitchen for a moment, there is a great deal of meat in *The Principles of Surety Underwriting*. Some of it is rare; some almost overdone. Unlike the roast of beef, the rare portions are at the ends, while the extremely well-done part is in the center. Especially delectable are the first two chapters, newly introduced in this edition, which have largely to do with the basic functions of surety bonds and the rights and benefits of the parties thereto. The fact that some of the work is overdone probably results from its having been put back in the warming-oven so many times.

There is a notable difference of style and approach in the newly added first two chapters and a large part of the remainder of the work. In these chapters the style is simple, almost conversational, and suggests a mellowness which comes only with maturity. The chapters on specific types of bonds, though written down to the freshman class, are as colorless, logical and incisive as a work on the axioms and corollaries of mathematics. The underwriting of surety bonds—even the basic principles of such underwriting—cannot or should not be delineated in quite that fashion. The

book is undoubtedly of tremendous informative value, but either the title should be modified or generalized or the treatment of the individual chapters on bonds should include more subjunctives.

It would be difficult to criticize, and extremely hard to find talent capable of improving on, Mr. Mackall's factual treatment of the subject. He has given us a competent, useable, trustworthy and in spots brilliant manual of our business. Like the cook book, he tells you how to do it—or rather how it has been done. Whether you *can* do it, with happy conclusion, is another matter. If you cannot then you will find that the author has escaped responsibility, for his book relates to the "principles" and not the "practices" of surety underwriting.

This reviewer laments the fact that other seasoned practitioners of the business, qualified in experience and aptitude, have not been as generous of their time and as hospitable to newcomers as has Mr. Mackall. How easily and how profitably they could instruct and inspire the fledglings. How selfish it seems of some of them not to tap their great store of information for the benefit of the recruits to this industry, an industry which contributes so much to the security of business engagements. If more surety executives would follow Mr. Mackall's example, the efficiency level of their personnel would be perceptibly lifted. That is long-range economy but the ultimate pay-off would crown the effort.

All through his book, Mr. Mackall reflects his own broad experience, his academic knowledge of, and sincere devotion to this business of surety bond underwriting. He is well and happily steeped in his subject. The field is richer by his sharing.

G. WILLIAM CRIST, JR.*

* Guest reviewer.

Right to the Point. Fifth Edition. The Rough Notes Co., Inc., Indianapolis, 1939. Pp. 146.

This little book, only about 6 by 4 inches and less than half an inch thick, is an elementary treatise on fire insurance. It was first published in 1898 and the present edition is the fifth. The publishers state that much material has been added and the plan of organization of the subject material has been completely revised. The book is intended for the instruction of fire insur-

ance agents and is written in language which should be readily understood by the merest novice in the business.

In the *Introductory* section of the book a definition is given of insurance; the powers and duties of the agent are described; a brief description of the insurance company and insurance boards is given and a brief description of the fire insurance policy and the procedure that should be followed in connection with lost and spoiled policies. In the next section entitled *Writing the Policy* 42 pages are given to a description of the principal elements entering into a policy under sub-heads such as The Amount, The Rate, The Insured, The Term, The Form, Values and Valued Policies, Clauses, Coinsurance, Endorsements and Daily Reports. In the section entitled *Agency Methods and Practices* there are discussions of cancellations, underwriting, losses, binders, applications, renewal receipts and agency records and supplies. The last two chapters of the book contain a description of the various allied lines of insurance and a description of the various kinds of insurance companies.

The entire book is written in the form of questions and answers and every effort is made to give information in the simplest possible manner. By way of illustration the question, "How is the premium rate arrived at?" is answered: "It is based upon the loss experience of the companies combined with the expense of their management." "What is the premium?" is answered as, "The money charged by the company for the indemnity agreed upon, of which the policy is the evidence."

It is really remarkable what a large amount of information needed by the agents is packed into the small compass of this book. Printed on good quality smooth paper and bound in bright orange covers the book is attractive and of such compact size it can easily be slipped into a coat pocket. It is said to have the widest distribution among fire insurance agents of any book of its kind ever published. The table of contents listed on 8 pages and the alphabetical index furnish a ready means of locating the particular page which contains the information desired.

One could easily be critical of this book if one were seeking precise technical information. In preparing an instruction book in such brief form it has doubtless been necessary to eliminate all but the most important phases of each subject. The agent

who has learned all that this book contains can readily supplement his knowledge from other sources.

H. O. VAN TUYL.

Social Security and Life Insurance, Paul F. Cranefield, Erwin A. Gaumnitz, W. Bayard Taylor. Security Press, Wisconsin, 1940. Pp. 202.

This slender book by Cranefield, Gaumnitz and Taylor devotes 5 chapters to Social Security benefits, largely to the program of old-age and survivors insurance, and 5 chapters to life insurance. The method of development within each chapter is to outline certain major points, to quote examples and to conclude with references suggested for further reading. It seems to be a series of classroom lectures stressing certain points which the lecturer believes important, illustrating those points and leaving the general synthesis for later review.

There is a good deal of acceptance of the sales arguments of Social Security and life insurance with a pretty fair rationalization of both types of protection. There are numerous minor arithmetical errors in the development of the material covering social insurance. Frequently explanations of underlying reasons for certain social insurance limitations or safeguards seem inadequate. The discussion of the application of formulas in social insurance and the suggestion of installment settlements in life insurance are highly suggestive however and should make clear the large cost of an adequate program. The discussion may well suggest that adequacy is a shifting concept and that few of us expect to attain a completely satisfactory standard of adequacy in developing our individual insurance arrangements.

While the treatment of national service life insurance, the civil relief act, the eventual possibility of war pensions and the difficulties of disability compensation is very much up to date, there seems no adequate appreciation of the effect on optional settlements of the steady reduction in interest returns. There is no discussion whatever of industrial or group insurance, two forms of life protection which together are furnishing a major service to those also protected by Social Security.

The attitude that Social Security is inflexible and life insurance

flexible is not essentially sound since flexibility in major or overall features must apply to Social Security even more than to life insurance.

Finally, it would seem that much of the Social Security material has been secured from reading those conscientious but incomplete appraisals of the new program which have appeared in print and that what might be termed the emerging philosophy of social insurance has necessarily been but briefly considered. Since both programs will adapt themselves more closely in the future to the needs of those covered this book will presumably have a rather temporary usefulness.

W. R. WILLIAMSON.

Statistical Calculation for Beginners, E. G. Chambers. The University Press, Cambridge; The Macmillan Company, New York, 1940. Pp. 110.

The scope of this book is precisely defined by its title. Practical methods of calculating such common statistics as averages, standard deviations, standard errors and coefficients of correlation are described in detail, and in each case a worked example, involving the use of arithmetic only, is given. For the benefit of students desiring further practice in calculating these and other conventional statistics, additional exercises with answers are supplied. Throughout the text major emphasis is placed on the actual process of calculation and comparatively little attention is paid to the significance of the results, or to their use, and in particular to the limitations of their use in appraising and interpreting observed data. This is perhaps consistent with the author's declared intention of not assuming mathematical ability on the part of the reader. Unless the reader does have a reasonably sound mathematical background, however, he will probably find it difficult to follow intelligently such parts of the discussion as that describing the normal distribution and its relation to the concept of statistical significance, or the final chapter dealing with the *chi* squared test of contingency and goodness of fit.

Within its limits this book should prove useful not only to computers but also to those who are familiar with statistical theory but feel the need of a brush-up review on methods.

OTTO C. RICHTER.

Motor Vehicle Inspection Manual. American Association of Motor Vehicle Administrators and the National Conservation Bureau, New York City, 1940. Pp. 123.

The *Motor Vehicle Inspection Manual* is a joint publication of the American Association of Motor Vehicle Administrators and the National Conservation Bureau. One chapter of the manual presents minimum standards for safe performance of motor vehicles that should be adopted by all motor vehicle inspection organizations. The remainder of the manual discusses the legal, organizational and administrative aspects of a model motor vehicle inspection system. The primary purpose of the manual is to aid states and municipalities in putting the code into effect and in fostering standard procedures for setting up and conducting inspection stations. In addition, this publication may be used for the guidance of supervisors, inspectors, garage owners and others concerned with the inspection problem. It should also be of value to automobile mechanics who are called on to make necessary adjustments and repairs on motor vehicles before they are inspected or after they have been rejected.

While it is recognized that the proper maintenance of motor vehicles in a safe condition is an important factor in preventing accidents on the streets and highways, this manual does not attempt to discuss other activities and procedures that are important from an accident prevention point of view. In other words a well organized motor vehicle inspection system is not a cure-all for maximum results in any state or municipality. This system must be organized hand in hand with other essentials such as standard driver licensing, accident reporting, a program of highway construction and improvement, competent traffic engineering and safety education, backed by efficient enforcement. These supplementary activities are discussed in other publications that can be secured from the National Safety Council and other organizations.

The *Motor Vehicle Inspection Manual* is amply illustrated.

W. DEAN KEEFER.*

* Guest reviewer.

PUBLICATIONS RECEIVED

A Penn Yan Boy, Edson S. Lott. Montross and Clarke Company. New York City, 1941.

Formulation of Federal Invalidity Insurance Program, Frank Lewand. Privately published, Washington, 1940.

Law's Statistical Tables. Fire and Marine Companies for 1941. Harrison Law, Nutley, N. J., 1941.

Life Insurance in the Democratic State, M. Albert Linton. University of California Press, Berkeley and Los Angeles, 1941.

Theory and Practice of Accident and Health Insurance, S. M. LaMont. Spectator, Philadelphia, 1941.

Reviews of the following publications appear in the current volumes of the *Transactions* of the Actuarial Society and the *Record* of the American Institute of Actuaries:

The Canadian Medical Association and the Problems of Medical Economics: A Series of Articles, Hugh N. Wolfenden. The Canadian Medical Association, 184 College Street, Toronto, Ontario, Canada, 1941. Pp. 100.

Accident and Health Insurance, Edwin J. Faulkner. McGraw-Hill Book Co., Inc., New York, 1940. Pp. 366.

College Plans for Retirement Income, Rainard B. Robbins. Columbia University Press, New York, 1940. Pp. 253.

CURRENT NOTES

THOMAS O. CARLSON, CURRENT NOTES EDITOR

AUTOMOBILE

Financial Responsibility Laws

Financial responsibility laws similar to the New Hampshire law have been enacted in Maine and New York. The Maine law took effect on July 25, 1941, while the New York law becomes effective on January 1, 1942.

The laws differ in detail but essentially they require that, when a motor vehicle accident occurs resulting in property damage above a certain amount or in bodily injury or death, any person involved as driver or owner must have his liability covered by insurance up to $5,000 per claim and $10,000 per accident for bodily injury and $1,000 per accident for property damage; or he must post security sufficient to satisfy any judgment which may be obtained as a result of the accident up to the limits above specified. In any event, if a person is involved in such an accident, he must provide evidence of financial responsibility in the future either in the form of an insurance policy or security up to the limits required and this must be done regardless of fault. Failure to comply with these requirements will result in the suspension of the person's license and registration.

BURGLARY

Coverages

Coverage under a separate policy form was made available on March 1st to provide insurance against those hazards which are excluded under banker's and broker's blanket bonds, in order to meet the demand for special coverage from assureds. The hazards covered are those of riot, civil commotion, vandalism, malicious mischief, hurricane, cyclone, tornado, flood, earthquake, volcanic eruption or similar disturbances of nature.

General

Annual Statement

The Committee on Blanks of the National Association of Insurance Commissioners has adopted a number of changes in the annual statement blanks for 1941. The changes in the blank for miscellaneous companies were for the most part clarifications of wordings and changes in the captions. Noteworthy among the latter is the change in the caption for the fifth section of the statement appearing on page 5 to read "Liabilities, Surplus and Other Funds" in lieu of "Liabilities."

The present Schedule O setting forth the record of "Losses and Claims Other Than Liability and Workmen's Compensation Claims," has been made Part 1 of the new Schedule O, and the columns have been rearranged in order to present a more logical development of data, two columns of totals being eliminated as unnecessary. A Part 2 has been added to Schedule O to show the development of incurred losses for Non-Cancellable Accident and Health insurance for a period of two years beyond the calendar year of claim.

National Defense Contracts

A comprehensive rating plan has been generally adopted applicable as an alternative rating basis for national defense projects for which Compensation and Liability insurance is approved by or recommended by the United States Government or any agency thereof. In the earlier stage, insurance was contracted for on the basis of competitive bids. Under the new plan, which originated in the War Department, the contractor selects the company with which he wishes to insure and the person who will act as his insurance advisor.

Risks which develop a premium of $5000 or more are eligible for the plan. Since the plan provides for an adjustment of the premium for all coverages combined, dependent upon the losses incurred during the policy period, all of the coverages must be written by a single carrier. An exception is made in the case of

states having state funds writing Workmen's Compensation insurance, where arrangements may be made for the state fund to provide the Workmen's Compensation coverage and another carrier to provide the Liability coverages; in such a case the compensation and liability coverages are still combined for rating under the plan.

The insurance is to be continuous and concurrent until the completion of the project, except that if the project is of indefinite duration the insurance is to be for a period of twenty-four months after which time it is to be renewed and the rating plan applied as though it were a new project.

The rating formula under the plan is as follows: Final premium equals (fixed charge + losses $\times$ 1.12 + allocated claim expenses) $\times$ tax multiplier, subject to a maximum premium equal to 90% of the standard premium $\times$ tax multiplier.

For Liability insurance the standard premium is the premium obtained by the application of the manual rates discounted 50%; this discount takes the place of experience rating and also recognizes the reduced liability hazards on these risks. For Workmen's Compensation the standard premium is defined as the premium determined by the application of manual rules and rates. Experience rating is not applied to the Workmen's Compensation premium, but the standard premium is discounted 10% before applying the percentage used to obtain the fixed charge. The fixed charge is a percentage of the standard premium (standard premium less 10% in the case of Workmen's Compensation) varying by size of risk from 37% for a $5000 risk to 6.3% for risks developing a premium of $700,000 or more. The loss multiplier 1.12 provides for unallocated expenses of investigating and adjusting claims. The tax multiplier varies by state and provides for taxes which are levied as a percentage of premiums and for assessments for industrial commissions, rating boards and bureaus; the tax multipliers are determined separately for Workmen's Compensation, for Automobile Liability and for other Liability. Payment to the insurance advisor is to be made separately by the contractor under a specified graduated scale of percentages. The standard premium used as a basis for calculating the premiums to the insurance advisors is the standard premium as defined previously, discounted 10%.

WORKMEN'S COMPENSATION

Rating of National Defense Projects—Pennsylvania

A new rating plan was approved in Pennsylvania in April for alternative application to national defense projects for which the Workmen's Compensation or Employers' Liability insurance coverage is approved by or recommended by the Federal Government or any agency thereof.

The plan incorporates a graduation of the allowances for production cost and for company expenses. The saving in expenses for all risks of a given size is returned to those insureds developing favorable loss ratios, the return being in proportion to the difference between the permissible and the actual loss ratio on each risk. This is accomplished by establishing a table of "premium return factors" varying by size of risk. The premium under the plan is then computed in accordance with the following formula:

> Final adjusted premium equals standard premium $\times$ [1.0 — premium return factor $\times$ (permissible loss ratio — standard loss ratio)]

The standard premium is the premium at the rates which would normally be charged for the risk. The standard loss ratio is the ratio of the actual losses incurred to the standard premium for the particular risk involved. The permissible loss ratio varies by size of risk because of the expense graduation, ranging from 65.2% for a $5000 risk to 79.6% for a $250,000 risk. The premium return factor represents that part of the saving on the risk which is to be returned; it varies from 35.1% on a $5000 risk to 93.1% on a $250,000 risk.

As an illustration of the application of the plan consider a $5000 risk developing a 35% loss ratio. The difference between the permissible loss ratio of 65.2% and the risk loss ratio of 35.0% at standard rates is 30.2%. The premium return factor for this size of risk is 35.1% and the product of 30.2% $\times$ 35.1% is 10.6%. The risk is therefore due a return at the end of the policy period equal to 10.6% of the standard premium, or $530, so that the net premium is $4470.

Ex-Medical Ratios

Acting on the suggestion contained in the paper by Mr. Stefan Peters in Volume XXVII, Part I of the *Proceedings*, the National Council on Compensation Insurance and the New York Compensation Insurance Rating Board have amended their procedure for calculating ex-medical ratios. The rating formula adopted by the two rating organizations provides for retention of 10% of the medical pure premium instead of the 5% retention suggested by Mr. Peters.

The previous formula was as follows:

$$\text{Ex-medical ratio} = .60 \times \frac{\text{Medical Pure Premium}}{\text{Total Pure Premium}}$$

The formula adopted by the National Council is as follows:

$$\text{Ex-medical ratio} = .90 \times \frac{\text{Permissible Loss Ratio}}{1.0 - \text{Acq.} - \text{Taxes}} \times \frac{\text{Med. P.P.}}{\text{Total P.P.}}$$

The formula adopted by the New York Board was the same as that adopted by the National Council, with a modification introduced to recognize the inclusion of the Security Funds factor and the assessment for the expenses of the Department of Labor in the rates.

The rating factors for application to ex-medical risks under the Experience and Retrospective Rating Plans have been modified accordingly.

Rates for Explosive and Munition Manufacturing Risks

Rates for this type of risk have in recent years been on an (*a*) rated basis. The advent of the defense program has increased the importance and number of these risks to such an extent that the National Council on Compensation Insurance has seen fit to establish manual rates for the classifications involved. The rates established are for optimum conditions with provisions made for the addition of supplemental loadings according to a definite rating plan for those risks possessing an excessive explosion or fire hazard.

Expense Graduation—New York

In the rate revision which became effective on July 1st in New York State provision of 17½% for total production allowance

was restored on risks developing an annual premium of $1000 or less, and at the same time a gradation of both production and company expenses was introduced for application to all risks developing an annual premium of more than $1000.

The change in the production cost allowance restored the provision for this item of expense in the manual rates to the percentage which was in effect prior to the July 1, 1935 revision, at which time the production cost allowance was reduced to 15% by order of the insurance commissioner. The saving resulting from the gradation of expenses is passed on to the insured in the form of discounts varying by size of risk. The table of expense gradation and discounts applicable is as follows:

PERCENTAGES OF UNDISCOUNTED PREMIUM

Undiscounted Premium	Premium Discount	Total Production Cost Allowance	Allowance for Administration and Audit
First $1,000.....	0	17.5%	8.8%
Next 4,000.....	4%	15.0	7.4
Over 5,000.....	12	10.0	4.7

Retrospective Rating Plan—New York

Concurrently with the rate revision effective July 1st, the rating values in the New York Retrospective Rating Plan were revised. The loss conversion factor was increased from 1.18 to 1.21 to include the expenses of the Department of Labor. The basic premium ratios were reduced to reflect the same gradation of company expenses as that noted in the preceding item of the current notes as applying to all risks. The table of rating values was extended from $150,000 to $500,000, the maximum premium being so graduated as to equal the standard premium at $500,000 as in the plan generally effective in other states.

MISCELLANEOUS LIABILITY

Manual Revision

A completely revised set of manuals applicable to miscellaneous liability insurance was issued on July 21, 1941. With this reprint the program, which was begun two years ago, of separating the

general liability manual into separate manuals for the different coverages was completed. Previously, separate manuals had been set up for Owners', Landlords' and Tenants' Liability, Elevator Liability and Product Liability. Now separate manuals for Contractual Liability, Manufacturers' and Contractors' Liability and Owners' or Contractors' Protective Liability are issued.

The revision also resulted in the discontinuance of Teams' Liability as a separate coverage. The Teams' classifications were consolidated and included in the Owners', Landlords' and Tenants' Liability Manual. The rates for these classifications were revised, substantial reductions being made effective in most instances. A further over-all reduction for both bodily injury and property damage was effected by the application of the Owners', Landlords' and Tenants' excess limits tables.

The rates for Owners' or Contractors' Protective Liability were also revised at this time resulting in a slight increase in the countrywide rate level for bodily injury and a reduction of approximately 30% for property damage liability. Several new classifications were erected for this coverage.

New classifications were also erected for Contractual and for Product Liability Insurance. Some of the new classifications included in the Product Manual apply to the form of coverage formerly known as Grantors' Protective Liability. This covers the liability for the use or existence of any condition in premises alienated by the insured, provided the insured has no right of control over such premises and the accident occurs after the insured has relinquished possession of the premises to others.

Newly included in the Owners', Landlords' and Tenants' Liability Manual were rates for the writing of Employers' Liability policies providing for medical aid and funeral expenses up to a $250 or a $500 limit. Previously these policies, which are only written concurrently with liability policies on residences and estates, provided only immediate medical aid.

The Manual reprint contained numerous changes in underwriting rules and in the scope of coverage of the various forms of liability insurance. Among the changes in the scope of coverage is the inclusion of a "batch clause" for Product Property Damage Liability which provides that if a product from one prepared or acquired lot shall, after sale, produce injury to more than one

thing, all damage proceeding from that common cause shall be considered as constituting one accident.

Another change which applied to all forms of coverage was the broadening of the definition of bodily injury liability to include liability for damage due to sickness or disease.

Personal Notes

Herbert P. Stellwagen was elected Executive Vice President of the Indemnity Insurance Company of North America.

Arthur Hunter has retired as Vice President and Chief Actuary of the New York Life Insurance Company.

William A. Hutcheson has retired as Vice President and Actuary of The Mutual Life Insurance Company.

Henry H. Jackson has been honored by election as President of the American Institute of Actuaries.

E. Alfred Davies has been made Assistant to the Treasurer of the Liberty Mutual Insurance Company.

Dudley M. Pruitt is Statistician of the Eastern Department of the Fireman's Fund Indemnity Company.

Wendell M. Strong has retired as Vice President and Acting Actuary of The Mutual Life Insurance Company.

James C. Barron has been elected Assistant Treasurer of the General Reinsurance Corporation.

William H. Crawford has been made Secretary of the Firemen's Insurance Company of Newark, N. J. and Affiliated Fire & Casualty Companies' Pacific Department.

Samuel M. Michener is now Actuary of the Columbus Mutual Life Insurance Company.

Harold S. Spencer is Statistician of the Aetna Casualty and Surety Company.

LEGAL NOTES

BY
SAUL B. ACKERMAN
(OF THE NEW YORK BAR)

ACCIDENT—INJURY

[Burns *vs.* Employers' Liability Assur. Corp., Ltd., of London, 16 N. E. (2d) 316.]

A sewer pipe broke in the hotel in which one Burns was staying and flooded through the cold storage tank of the hotel. In the sewage were amebae, and these amebae eventually infected the drinking water. Burns drank the infected water and contracted amebic dysentery, from which he died. Burns' widow brought this action against the insurance company for compensation for the death of her husband, upon an accident insurance policy which insured Burns "against bodily injuries sustained, during the term of this policy, solely and independently of all other causes through accidental means."

Was the company liable on the policy?

The court held that although Burns died through accidental means, he had not suffered bodily injuries and therefore denied recovery.

On the question of accidental means, the Court stated:

"Generally an accident is considered as an event proceeding from an unexpected happening or unknown cause without design and not in the usual course of things.

"The element of accident must be found to exist in the means or cause which produced the bodily injury rather than in the result.

"Tested by the general rules of interpretation, if one would drink from a stream which had been polluted at some length of time and thereby contract a disease, that would not be an accident. If, on the other hand, the stream had been clear prior to the time he stopped to quench his thirst, but shortly before a sewer pipe had broken and infected the water with disease germs which he drank, an accident would have intervened. True, the accidental force did not operate directly upon the one drinking, but the breaking of the pipe was unexpected and unforeseen and

did not happen in the usual course of things. It would not be so remote as not to be considered an accident so far as the consumer of the water is concerned.

"In the instant case the breaking of the pipe was accidental. When Burns drew the water from the faucet he expected it to be pure. But for the breaking of the sewer pipe and the subsequent infecting of the water cooling system, it is to be presumed that it would have been. The amebae infected the water by an accident, and consequently it was likewise accidental that they entered the system of Burns. We have no difficulty in holding that Burns' death was due to amebic dysentery which was accidentally contracted, as the term is commonly used in every day speech.

"But," continued the court, "was the contraction of amebic dysentery a bodily injury covered by this particular policy? There was no violence, vis major, or other casualty which operated directly upon Burns.

"Certainly, a disease such as pneumonia or typhoid fever is not thought of in every day language as a bodily injury.

"Yet to uphold the contention of the insured would compel us to say that if the disease was due to any mishap, recovery may be had but not otherwise. Logically, this would lead to the conclusion that all diseases are bodily injuries. There would be no difference between an accident policy and a health policy, except in so far as it would be necessary to trace the cause in the former to some mischance.

"In the case before us, the intention was not to give full indemnity. It was not a general health policy but a limited accident policy, and the premium collected was for a limited coverage. Therefore, bodily injury is and should be, in this type of case, considered as limited to bodily injuries resulting from physical or external forces known as accidents.

"In this case Burns died of amebic dysentery. That is produced by a small parasite . . . these parasites produce a degeneration of the tissues that, in some cases results in death. All diseases produce a somewhat similar degeneration, and to include all diseases as bodily injuries seems to ignore the common meaning of the words."

The court concluded: "The words 'bodily injury' are commonly and ordinarily used to designate an injury caused by external vio-

lence, and they are not used to indicate disease. We do not speak of sickness as an accident or an injury. When we hear that someone has suffered an accident, we conclude that he has suffered, more or less, some external bodily injury. Since the words 'bodily injury' are used in the policy in their common and accepted meaning, it is only by a strained and illogical construction of the words that they can be held to include a disease not resulting from some external violence. We do not think of one suffering from typhoid fever as being bedridden as the result of an accident or injury.

"In order to create liability under a policy insuring against bodily injuries caused directly, solely and independently of all other causes by accidental means, there must be evidence of some external or violent and accidental force or cause."

Automobile—Automatic Insurance

[Aetna Casualty and Surety Co. *vs.* Chapman, 200 So. 425.]

A retail grocer owned and operated a ½-ton pick-up Chevrolet truck in connection with his grocery business. He purchased an "Automobile Basic Liability Policy" on this truck covering bodily injury liability. During the policy period, he turned in the truck to a garage for repairs. This company furnished him its own Ford ½-ton pick-up truck, for use while his truck was undergoing repairs. It was contemplated the ensuing day would be consumed in making repairs. While operating this Ford truck in connection with his grocery business, and on the same day it was delivered to the insured, the insured ran into and killed a child.

The liability of the insurance company depends on whether the Ford truck was covered under the clause of the policy entitled *"V Automatic Insurance for Newly Acquired Automobiles."* This clause provides, "If the named insured who is the owner of the automobile acquires ownership of another automobile, such insurance as is afforded by this policy applies also to such other automobile as of the date of its delivery to him, subject to the following additional conditions . . . (3) the insurance afforded by this policy automatically terminates upon the replaced automobile at the date of such delivery; . . ." What is the company's liability?

The court held that the insured did not acquire ownership of the Ford automobile in order to bring the "Automatic" insur-

ance clause into effect. The court stated: " 'Acquires ownership' we must conclude, clearly means such ownership as the ordinary man ascribes to his own, the property right which he holds as owner; the right of user, and interest in its protection which goes with a sense of ownership.

"We can see nothing in this stipulation favorable to a construction extending the coverage to a truck obtained for temporary use while the truck covered by the policy is undergoing repairs. If, for example, this accident had occurred after the Chevrolet had been repaired and put back in the service covered by the policy, would the insurer be heard to say, this policy has terminated as to this truck, because you acquired and put into temporary service a Ford truck? Again, if the ordinary citizen, while holding and using this Ford truck as here, had been asked whether this was a newly acquired truck, whether he had acquired the ownership of this truck, would he not have answered no; it is owned by the garage people, who let me have the use of it while my Chevrolet is being repaired?

"Our conclusion is the automatic insurance provision does not apply to the Ford truck under the facts of this case."

Automobile—Property Damage

[Cohen & Powell, Inc., *vs.* Great American Indemnity Co., 16 Atl. (2d) 354.]

One Mauriello was engaged in the motor freight transport business which he operated from a large garage leased by him in New Haven. Mauriello sublet a definitely allocated space in this garage to Cohen & Powell, Inc., for storage of one truck. This space was reserved for the exclusive use of Cohen & Powell, Inc., which stored its truck there nightly. This truck was damaged by reason of the operation of a truck owned by Mauriello and being driven by his employee. On the date of the accident, Mauriello's truck was covered by a liability insurance policy in the usual form, which contained a clause excluding coverage of damage to property "owned by, rented to, leased to, in charge of, or transported by the insured."

Cohen & Powell, Inc., recovered a judgment against Mauriello and sought to hold the insurance company liable on its policy.

The company denied liability, claiming that the truck of Cohen & Powell, Inc., was in charge of Mauriello and therefore excluded from coverage. What were the rights of the company?

The court in refusing to apply the exclusion clause to the truck of Cohen & Powell, Inc., held that the latter's truck was not "in charge of Mauriello."

Said the court, "While the word 'charge' has a very broad and varied meaning, a person or thing is not 'in charge of' an insured within the meaning of the policy unless he has the right to exercise dominion or control over it." Therefore Mauriello's insurance carrier was liable.

Blanket Bond—Defalcation

[Continental Casualty Co. *vs.* First Nat'l. Bank of Temple, 116 F. (2nd) 885.]

The insured bank had a blanket bond and the obligation of the bond was to "indemnitfy . . . . against the direct loss, sustained while this bond is in force, ... of any money or securities, ... in which the insured has a pecuniary interest, or held by the insured as collateral or as bailee and whether the insured is liable therefor . . . . through any dishonest act wherever committed of any of the employees . . . ."

The bank proved that funds were withdrawn from the accounts of the customers. When subsequent deposits were made by other customers, credits therefore were given to those accounts from which withdrawals had been made for the amounts of such new deposits. The new deposit slips were withheld from the records of the bank, so that the books would balance. However, such new deposits only served to cover up the previous withdrawals and the liability of the bank remained the same, being merely switched from one depositor to another.

Experts at the trial testified that the effect of the withholding of the deposit slips resulted in the reduction of the assets of the bank by the amount of the withheld slips. The admission of this testimony was objected to by the surety on the ground that the question of direct loss as required in the bond was one for the jury. Was the surety liable?

With respect to the question as to whether there was a reduc-

tion of the assets, the court stated, "This could only have been true if the employees, at that time, had actually withheld or withdrawn the money represented by the deposit slips from the bank. If, on the other hand, they had placed it with the bank and given some other depositor credit therefor, in order to cover up money previously withheld or withdrawn and charged to the latter's account, the bank's assets would neither have been increased nor diminished, because, while it would have reduced its liability to the one whose funds had previously been taken, by the same act, it would have become liable to the new depositor for the amount represented by this deposit slip of entry in his bank book. It must be remembered that the insurance was against 'all direct loss, sustained while this bond is in force . . .' A fair interpretation of the language would seem to mean an actual present loss, as distinguished from a theoretical or bookkeeping loss. In other words, some action which reduced the available assets in the hands of these employees as against its liabilities to depositors, creditors and stockholders."

As to the question of the admissibility of the testimony of the experts, the court stated, "It is our view that the experts should have been restricted to giving testimony as to what was actually so in each instance as revealed by the records and to explaining any technical matter involved in banking or accounting. It should have been left to the jury to determine the ultimate question as to whether any of the assets of the bank had or had not been diminished in making the final conclusions as to the liability of the surety .... Before the bank can recover any part of its claim, it is necessary to show that a direct loss was actually sustained by the dishonest acts of its employees."

Burglary—Illegality

[Northwest Amusement Co., Inc., *vs.* Aetna Casualty and Surety Co., 107 P. (2d) 110.]

The Northwest Amusement Co., Inc., purchased a mercantile burglary insurance policy for direct loss by burglary of merchandise usual to insured's business, being that of "Premium Store." During the period of the policy the insured's premises were burglarized and twenty-seven slot machines were stolen therefrom.

At the time of the issuance of the policy there was in effect an ordinance which made it unlawful to possess slot machines or other gambling devices. The insurance company opposed the Amusement Company's claim for indemnification on the ground that because possession of slot machines is forbidden by ordinance, their loss by burglary cannot be made the basis of recovery upon the burglary policy. What were the rights of the insured?

The Court held that the insured's possession of the slot machines was a continuing violation of the ordinance. The possession of the slot machines was prohibited by an ordinance which was an integral part of the insurance policy. The policy purported to insure against the loss of such possession by burglary. Therefore, construing the policy as if the terms of the ordinance were written therein, in effect such policy undertook to insure against loss of a non-existent right, namely, the right to possession of slot machines.

The Court applied the following four tests in determining whether or not recovery should be permitted upon contracts challenged as illegal:

(1) Did they aid or tend to aid a result possible of attainment only by an unlawful act or one contrary to public policy?

(2) Could the insured establish his case without reference to or reliance upon an illegal act or transaction?

(3) Is the contract a new contract based upon separate legal consideration?

(4) What is the evil apprehended if the contract be enforced?

Applying these tests to the facts, the Court found: ". . . the first three of these tests disclose that the contract of insurance herein is not enforceable. (1) It tends to aid in the unlawful possession of slot machines. (2) The insured could not establish his case without proving his illegal possession thereof. (3) The consideration for the indemnity insurance was insured's possession of the slot machines; if there had been no such possession there would have been no insurance indemnifying the Amusement Company against its loss by burglary."

Applying the fourth test, the Court stated: "The evil to be apprehended if such policies are held to be valid and enforceable,

is such as invariably attends disregard for and violation of law, namely, a weakening of the only real safeguard of the rights and privileges of citizenship, which consists of respect for and enforcement of law."

The Court concluded: "The rule of public policy, which prevented a recovery in Court upon such an agreement, is not based upon the impropriety of compelling the insurance company to comply with its contract. That in itself would generally be a desirable thing. Relief is denied because the insured is a wrongdoer."

Employers' Liability—Tuberculosis

[Maryland Casualty Co. *vs.* Pioneer Seafoods Co. et al., 116 F. (2d) 38.]

In December 1936 the Pioneer Seafoods Co. purchased an employers' liability policy which purported: "I. To insure said named assured against loss from liability imposed by law upon the assured for damages (direct or consequential) on account of bodily injuries, including death resulting therefrom, accidentally suffered or alleged to have been suffered by any employee of the assured . . . provided such bodily injuries or death suffered as the result of accident occurring within the terms of this insurance. . . ."

On April 12, 1938, Hanseth, who was employed by the insured as a gill netter and seaman, filed an action in a state court to recover damages and alleged that the insured furnished him sleeping quarters on the boat which "were negligently constructed, equipped and maintained," and that as a result of such negligence, his "health was so weakened and undermined that . . . (he) became physically weakened and his ability to resist germ invasion was almost completely destroyed . . . his susceptibility to the attack of the tuberculosis germ was raised to a high point" and that he contracted tuberculosis. The state court gave a judgment for Hanseth and the insurance company denied liability on the policy on the ground that Hanseth's injury or disease was not sustained by "accident" within the meaning of the policy. Was the insurance company liable?

The court in determining that the company was liable stated, ". . . (the company) is liable if (1) liability for damages was

imposed by law upon the (insured) for 'bodily injuries . . . accidentally suffered'; or (2) liability for damages was imposed by law upon the (insured) for 'bodily injuries . . . alleged to have been suffered'. Whether the injuries resulted from 'accident' is therefore immaterial under these provisions. However, the provision requires such bodily injuries to be 'suffered as the result of accident occurring within the terms of this insurance.' Therefore, since liability was imposed by law upon the insured for Hanseth's bodily injuries, the company is liable if such injuries were suffered 'as the result of accident'."

The court defined the nature of an accidental injury as follows: "if, in the act which precedes the injury, something unforeseen, unexpected, unusual occurs which produces the injury, then the injury has resulted through accidental means. Under this broad rule, the physical weakening of Hanseth was unforeseen, unexpected and unusual as to him, and therefore the bodily injuries were accidental. Under such a policy, whether the injury was suffered as a result of accident is to be determined from Hanseth's standpoint, or in other words, while the event which caused the injury was the insured's negligence, the occurrence of the event as to Hanseth was accidental."

The court distinguished the class of workmen's compensation cases where injuries such as here involved were held not to be accidental by stating, "while losses of that class are controlling in the determination of the question as to the proximate cause of death or injury, they are not controlling in the determination of the question as to what constitutes an 'injury'. Indeed the Workmen's Compensation Act specifically defines 'injury', giving it a much narrower meaning than the meaning which we must attribute to the word in the policy." Therefore, the company was liable.

Fidelity—Multiple Employers

[National Surety Corp. *vs.* Hall, 109 P. (2d) 905.]

The Hall Garage purchased a fidelity bond which provided that: "The surety . . . hereby agrees to make good within sixty (60) days after receipt of proof satisfactory to it, any loss not exceeding during its entire period of suretyship, Two Thousand Dollars ($2,000), which M. G. Hall Garage, employer, may sus-

tain by reason of any act of larceny or embezzlement of L. W. Jones, employee, in the performance of the employee's duties as bookkeeper and cashier, at Trinidad, Colorado, in the employer's service, committed alone or in connivance with others, after the 7th day of August, 1928, and before the termination of this bond, . . ."

The bond was in full force and effect from August 15, 1928, until terminated, as to subsequent acts, August 7, 1935, by mutual consent. During all this time the Paramount Oil Company, of which Hall was the manager and secretary-treasurer, with headquarters in the Hall Garage at Trinidad, Colorado, had been operating from that place of business. Hall "was answerable for the safekeeping of the property and funds of the (Paramount) company," and all of its books were kept, and its business transacted, at the Hall Garage. During the time the bond was in force Jones, the bookkeeper and cashier for Hall, mulcted funds of the Paramount Company to the extent of about $7,500, the theft being in various amounts during each of the years covered. No loss was discovered until April 1, 1936, when Jones, after severing his employment with Hall, left a note informing his employer of his thefts. Notice of the claim was given April 6, 1936.

The surety company raised several objections to its liability under the Hall bond. The company contended that the money was stolen from the Paramount Company and not from Hall, the obligee. In addition, the surety contended that since the peculations were from the Paramount Company the Hall Garage suffered no loss, as the discrepancies appeared in the Paramount and not the Hall books.

What was the liability of the surety company?

As to the company's first contention, the court stated: ". . . Jones worked on the books of the Paramount Company as a part of his duties as bookkeeper for Hall, such work being clearly within the language of the bond 'in the performance of the employee's duties as bookkeeper and cashier, at Trinidad, Colorado, in the employer's service.' . . . Since there was no change in his work at the time the bond was written or at the time it became effective, we must assume that the company was aware of those duties and knew that they were included in the risk that it undertook to cover. The attempted segregation of the risk because of

separate legal entities is not persuasive, and does not relieve the company of liability."

As to the second defense of the surety company, the court stated that ". . . the loss is charged against Hall on the books of the Paramount Company and the mere fact that there is a possibility of the Paramount Company being reimbursed by other surety does not relieve Hall from his responsibility for the loss." Therefore, the surety company was liable.

HOSPITAL—WAIVER

[Great American Accident Ins. Co. *vs.* Roggen, 144 S. W. (2d) 1115.]

Roggen was insured under a hospitalization insurance policy providing for monthly payments to be made on the twentieth day of the month. The important provisions of the policy were "if default be made in the payment of agreed premiums for this policy, the subsequent acceptance of a premium by the Company or by any of its authorized agents shall reinstate the policy, but only to cover accidental injury thereafter sustained and such sickness as may begin more than 15 days after the date of such acceptance."

The policy further provided: "The time of payment of premiums shall be deemed to have expired, and insurance forfeited if premium has not been received at the office of the Company by 12:00 noon . . . on the morning of the day the premium is due. Payment of any premium to any agent of the Company shall not effect renewal . . ."

The facts were that all payments were due on the 20th of the month, that on June 22 a $2.00 payment was made for June, and that on July 22 a payment of $4 was made, $2 of which was for July and $2 for August; and that all the payments were accepted without reservation. The insured's illness as a result of which she based her claim for benefits under the policy, started less than 15 days from June 21.

The insured filed her claim for benefits under the policy for such illness and on August 25 the Company wrote a letter denying liability under paragraph 3 of the policy, which reads: "This

policy shall not cover when the immediate and contributing cause is due to either injury or disease which had its inception prior to the issuance of the policy." The letter further stated: "For the foregoing reasons as well as other reasons none of which are being waived by us, we are of the opinion that no liability exists under this claim." The question is whether the Company is liable under the policy in view of its acceptance of the late premiums.

The court after holding that the provision providing for the penalty for late payment of a 15 day forfeit of the monthly term of hospital protection provided for in case of sickness, was lawful in this type of insurance, found that there was no waiver of the terms of this provision by the letter of August 22nd.

The court also stated: "Where the (insurance) Company refuses to pay a loss upon a specific ground, it is estopped from asserting other grounds relieving it from liability of which it had full knowledge where insured has acted upon its position as announced and has incurred expense in consequence of it, or, as the rule is sometimes more broadly stated, when one specific ground of forfeiture is urged against a policy of insurance and the validity thereof denied on that ground alone, all other grounds are waived."

The court continued however: "We are constrained to hold that the rule just referred to does not apply to the facts found because, as appears from the letter, the insurance Company in effect stated that it was waiving no grounds which it had for not paying the claim. The intention to waive grounds of defense, which are not expressly stated, cannot be implied against the express statement that such grounds are not waived."

Therefore the court found no liability on the part of the Company under the policy.

Liability—Coverage

[Standard Accident Ins. Co. *vs.* Thompson, 146 S. W. (2d) 238.]

By an indorsement on a liability policy issued to a railroad, the insurance company agreed to insure the operator of the railroad properties against loss from liability imposed by law upon the insured for damages on account of bodily injuries, including death resulting therefrom, accidentally suffered or claimed to have

been suffered by any person which was "caused by or in any way arising from, out of or by reason of any work whatsoever being done in connection with or incident to the construction of underpasses, overpasses or other work in connection therewith or incident thereto . . ."

While the policy was in effect, the operator was engaged in enlarging an underpass under the railroad tracks, and the work made it necessary to construct and maintain a temporary crossing for those using the highway which crossed the tracks where the underpass was being reconstructed. One Talley, while driving his automobile along the highway, struck, or was struck, by one of the operator's regular passenger trains. Talley's claim was settled by the railroad with the consent of the insurance company. Was the insurance company liable to the railroad?

In holding the insurance company liable, the court stated, "That the insurance company intended to assume a liability over and beyond the liability of the railroad for damages proximately caused by doing work on the underpass is manifested by the absence of any . . . limitation. It is a matter of common knowledge that there is an ever present danger of collision where highways and railroads cross at the same level. It is in anticipation of, for the purpose of obviating this danger that overpasses and underpasses are constructed. It was, therefore, entirely reasonable for the operation of the railroad, during the period that it was necessary to divert traffic which passed over the highway from passing through the underpass so as to make it cross the railroad in the very pathway of the trains, to insure against losses which the underpass, when open, obviated.

"During the period that the work on the underpass necessitated that the traffic passing over the highway stop passing under the railroad and cross at the same level of the railroad, the operator was, because of such work, naturally exposed to the danger of collisions, as an incident of operating the railroad which the underpass was designed to obviate, and thus subjected to damage suits. It was as reasonable, therefore, for the parties to anticipate that during the time the work stopped the use of the underpass that crossing accidents might occur, as it was to suppose that there was any need to maintain such underpass after it had been repaired and enlarged. As the terms of the endorsement are broad

enough literally to insure the operator against the liability here involved, and the construction to that effect is a reasonable one, we are constrained to hold that the endorsement insured against this type of accident."

MALPRACTICE—CONTRACT

[Safian *vs.* Aetna Life Insurance Company, 24 N. Y. S. (2d) 92.]

The carrier issued a malpractice policy and in November 1935 a patient of the insured doctor sued him for damages, alleging an express agreement by the physician to remove certain facial blemishes. After several operations the abnormality was worse and "by reason of the violation of the agreement" on the doctor's part, the patient sought $12,000 in damages. The insurance company notified the doctor it would not indemnify him for any recovery in the action if it was based on any contract, guaranty, or specific agreement in connection with the treatment of the patient. But as the doctor denied any contract to cure, the insurance company stated it would defend without waiving its rights. The Company referred to a statement in connection with the issuance of the policy in which the doctor represented that he did not have in force and would not "enter into any special contract or agreement . . . guaranteeing the result of any operation or treatment." The jury rendered a verdict in favor of the patient on an action for breach of contract. The judgment was reversed by a higher court on a technicality. During the second trial of the case the doctor settled the claim and sought indemnification from the insurance company. Was the Company liable?

The court in finding no liability on the part of the Company stated: "In this case no facts or circumstances establishing waiver or estoppel were established. Here the basis of nonliability is not that the coverage was voidable by reason of any breach of condition, but that no insurance was ever issued or in existence covering a cause of action based upon a breach of contract to cure.

"It should be obvious that insurance coverage for claims arising out of 'malpractice, error or mistake,' is clearly legally distinguishable from coverage for breach of contract. The legal duty, the breach of which is covered, is wholly different. If a doctor makes a contract to effect a cure and fails to do so, he is liable

for breach of contract even though he uses the highest professional skill. Insurance of such a contract would protect only medical charlatans. The honorable member of the medical profession is more keenly conscious than the rest of us that medicine is not an exact science, and he undertakes only to give his best judgment and skill. He knows he cannot warrant a cure. The settlement was made on the patient's claim that the doctor had breached his contract to cure. The insurance company gave no coverage for such a claim and is not answerable for any damages suffered by reason of a breach thereof."

Owners', Landlords' and Tenants' Liability—Extraordinary Repairs

[Courtney *vs.* Ocean Accident and Guaranty Corp., 142 S. W. (2d) 858.]

One Courtney was employed to make repairs on a building owned by Sprague, which had been damaged by a fire. Courtney was standing on a damaged elevator in the course of his duties when the lift fell and he was killed. Sprague had a liability policy with the insurance company and after the return of a judgment against Sprague unsatisfied, Courtney's widow sought to require the insurance company to pay the judgment. In resisting the claim of Courtney's widow, the insurance company relied on a provision of the policy which was as follows: "Unless otherwise specifically written in or endorsed on this policy, said policy shall not cover . . . bodily injuries or death caused by the construction, reconstruction, demolition or extraordinary repair of any elevator or hoisting device, or the building or structure within which it is contained; but privilege is granted under this policy to make such ordinary alterations and repairs as are necessary to the care of any elevator covered herein and its maintenance in good condition including the renewal of existing mechanical equipment, provided that such elevator shall not be used for service while such work is being done."

The value of the building was $33,000. The repair bill amounted to $3,457.74. The damage as a fire insurance loss was adjusted for $3,716.20.

The insurance company contended that the repairs made in the

building when the elevator fell were extraordinary repairs and that under the terms of the policy there was no liability.

What was the liability of the insurance company?

The court held that there was no liability on the part of the insurance company since these were not ordinary repairs but extraordinary repairs, and consequently within the exculpation clause of the policy. As stated by the court, " 'Ordinary repairs' are such as result from ordinary wear and tear of the building and its decay, but 'extraordinary repairs' are something greater than this. It is such repairs as are made necessary by some unusual or unforeseen occurrence which does not destroy the building, but merely renders it less suited to the use for which it was intended. The word 'repair' does not include the word 'rebuild', and the courts have never so held if a house be destroyed by fire, to restore it would not be to 'repair' it, but to 'rebuild' it, and this is true even if the walls or some part thereof be standing in substantially the same condition in which they were before the fire."

The court found the word "ordinary" defined in Webster's dictionary as "belonging to what is usual; having or taking its place according to customary occurrence or procedure; usual, normal." The word "extraordinary" is defined by Webster as "beyond or out of the common order or rule; not of the usual, customary, or regular kind; not ordinary."

Concluding, the court stated, "the repair work being done by Courtney at the time of his fall and death was part of the whole repair, and it cannot be said, in fairness and within reason, that the repairs were not extraordinary." Therefore, the company was not liable.

OBITUARY

WILLIAM THOMAS PERRY

1878 - 1940

William Thomas Perry, a Fellow of this Society, was killed on October 25, 1940, through enemy action. His wife, who was severely injured at the same time, died within twenty-four hours.

Mr. Perry had been indisposed and at the urging of his associates remained at home on the day of the occurrence. An enemy flier, driven from the London area, on his way back to Germany dropped a bomb, which squarely struck the rear wing of Mr. Perry's home," The Hazard," at Crowborough in Sussex.

Mr. Perry entered the service of The Ocean Accident and Guarantee Corporation, Ltd., in January 1898 in the Workmen's Compensation Department at the Head Office in London. His outstanding abilities were quickly recognized and after filling various important posts in that department, he was appointed in 1907 Manager of the Mark Lane (London) Branch. After achieving unusual success at that branch he was transferred to the United States Branch in 1917, and in 1918 was appointed Manager for Canada. In 1923 when Mr. W. Langton Cavers was appointed Manager at the Head Office in London, Mr. Perry was appointed Assistant Manager, subsequently being promoted to Deputy Manager, and finally Manager with Mr. Cavers. For nearly forty-three years Mr. Perry served the Corporation devotedly and with distinction and his tragic death will be deplored by all of his friends and colleagues.

OBITUARY

EDWARD C. LUNT

1863 - 1941

Someone has coined the phrase "citizen of the world" to imply that one's activities and loyalties are of great scope. A somewhat similar expression might be used to describe Edward C. Lunt's position in the insurance world. He was constantly employed by one company or another; but it may be said that he was a servant of the business at large, so wide were his interests and his services. He was an institution and his death on January 13, 1941, must be regarded as a public calamity.

Edward C. Lunt was born at Malden, Mass., on March 1, 1863, the son of Andrew Francis and Amanda Clark Lunt. He attended Harvard University and upon his graduation became secretary to Senator George F. Hoar of Massachusetts. His first contact with the business of corporate suretyship occurred in 1901 when he joined the Fidelity and Casualty Company, which he was subsequently to serve as Vice-President. In 1922 Mr. Lunt left the Fidelity and Casualty Company to become President of the newly organized Sun Indemnity Company where he remained until 1926, when he resigned to install and operate the surety department of the Great American Indemnity Company as Vice-President of the Company, the position he was occupying at the time of his death.

Mr. Lunt was an indefatigable worker. Realizing that a knowledge of the law was a valuable aid to one entrusted with the solution of surety problems, he studied law and became a member of the New York Bar.

Where others, on the "inside," might have been willing to capitalize upon the popular conception that corporate suretyship was a mysterious and complicated business, Mr. Lunt, early in his career, resolved to educate all those who might be interested, in the principles and uses of surety bonds. Many persons now occupying positions of great responsibility and countless others less fortunately placed, will acknowledge a debt of gratitude to Lunt,

the author and lecturer who brought to his teachings and pronouncements a deep understanding of his subject, illuminated by a vocabulary and fecund wit seldom found in dissertations of such a technical nature.

His book "Surety Bonds," has long been recognized as standard reading for students and his annual reviews of surety developments were always eagerly awaited. In addition he was the author of numerous pamphlets and articles, one of which was "Surety Rate Making—An Approach to the Subject." (Volume XXV of our *Proceedings*.)

Particularly fortunate were those who were privileged to hear Mr. Lunt speak. His services on the speakers' platform were greatly in demand, and his easy delivery, subtle humor, scholarly learning and masterful phrase-turning invariably captivated his audiences.

In committee work he was recognized as a leader, conciliator and worker. Every existing practice, form, rule and classification bears, in some measure, the imprint of his mind. His guidance and counsel will be sorely missed in the Surety Association, Towner Rating Bureau, Bureau of Contract Information and elsewhere whenever surety men meet to discuss and to solve their mutual problems.

To his personal relationships Mr. Lunt brought all the qualities which promote affection, admiration and respect. He was a gentleman—kind, considerate, courteous, tolerant, fair and reasonable in all his dealings. Little wonder, therefore, that his death is so widely mourned and that so many people are stunned as with a sense of deep personal loss.

OBITUARY

JAMES F. MITCHELL

1877 - 1941

James F. Mitchell, a charter member of this Society, died at his home in St. Davids, Pennsylvania, on Sunday, February 9, after an illness of about a year. He was buried in Valley Forge Memorial Cemetery on Tuesday, February 11.

Mr. Mitchell was born in Baltimore on September 12, 1877, and was educated in the public schools of that city and the City College of Baltimore. He began his insurance career in the Home Office of the Maryland Casualty Company, starting as an office boy. He early became a deep student of the casualty business and as a result of his interest and study was advanced to the position of Secretary of the company. In 1916 he resigned this position to become Assistant United States Manager of the General Accident Fire and Life Assurance Corporation in Philadelphia. His special attention in this company was given to underwriting and he became a recognized authority on casualty, actuarial and underwriting procedure. Much of the credit for the company's remarkable progress has been attributed to Mr. Mitchell's ability as an underwriter and on April 1, 1935, he was appointed United States Manager to succeed Mr. Frederick Richardson when the latter became Deputy Chairman of the Board in Perth, Scotland.

Mr. Mitchell was a member of many clubs and organizations, including a number associated with the insurance business. In addition he was deeply interested in the affairs of the Wayne Methodist Church and was president of the board of trustees.

It is with deep regret that we record the passing of another of the charter members of this Association. We owe much to the foresight and vision of men like James F. Mitchell and are grateful to him for the sound foundation which he helped to build for the casualty business.

CASUALTY ACTUARIAL SOCIETY

MAY 16, 1941

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ABSTRACT FROM THE MINUTES OF THE MEETING
MAY 16, 1941

The semi-annual (fifty-sixth regular) meeting of the Casualty Actuarial Society was held at Trinity College, Hartford, Connecticut, on Friday, May 16, 1941.

President Pinney called the meeting to order at 10:30 A. M. (daylight saving time). The roll was called showing the following forty-two Fellows and fifteen Associates present:

FELLOWS

AINLEY	GRAHAM, C. M.	MOONEY
BARBER	GREENE	OBERHAUS
BERKELEY	HOBBS	PAGE
CAHILL	HOOKER	PERRYMAN
CAMERON	HUNT	PICKETT
COATES, C. S.	JONES, H. M.	PINNEY
COGSWELL	KARDONSKY	PRUITT
COMSTOCK	KIRKPATRICK	SMITH, S. E.
CRANE	KORMES	TARBELL
DORWEILER	LINDER	VALERIUS
FALLOW	MASTERSON	VAN TUYL
FARLEY	MATTHEWS	WAITE, A. W.
FONDILLER	MCMANUS	WHITNEY
GINSBURGH	MILLER, J. H.	WILLIAMS

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BLACK, N. C.	GILDEA	PETERS
BLACKHALL	HALL, H. L.	SPENCER
FITZ	JOHNSON, R. A.	WARREN, C. S.
FURNIVALL	MARSH	WILLIAMSON

Dr. R. B. Ogilby, President of Trinity College, made an address of welcome.

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

Mr. Pinney read his presidential address.

The minutes of the meeting held November 15, 1940, were approved as printed in the *Proceedings*.

The Secretary-Treasurer (Richard Fondiller) read the report of the Council and upon motion it was adopted by the Society. The Council had decided at its meeting on March 20, 1941, to adopt rules respecting admission of Fellows without examination for the guidance of the Committee on Admissions, including the condition that candidates for admission as Fellows without examination shall be restricted to Associate Members of the Society. The Council had also decided that, commencing with 1942, the examinations would be held on the first Wednesday and following Thursday in the month of April in each year and that applications must be received before the fifteenth day of January. Henry C. Carver had been reinstated as a Fellow of the Society.

The President announced the deaths, since the last meeting of the Society, of four Fellows, Robert J. Hillas, Edward C. Lunt, James F. Mitchell and W. T. Perry, and the memorial notices appearing in this Number were thereupon read.

The new papers printed in this Number were read.

Hon. John C. Blackall, Commissioner of Insurance of Connecticut, addressed the Society.

Recess was taken for lunch at the College Dining Hall until 2:30 P. M.

Informal discussion was participated in by a number of members and invited speakers upon the following topics:

"As respects the Liability lines, why not issue unlimited coverage as standard coverage, subject to limitation by endorsement in exceptional cases?"

"Insurance problems and rate making procedure in connection with United States Government Defense Projects."

"What steps should be taken by American casualty companies to protect themselves and their policyholders against the possibility that developments in the War may make it inadvisable or impractical to secure adequate excess limits and special risk protection in foreign markets?"

The papers presented at the last meeting were discussed.

The Hartford Companies were hosts at a dinner which was given at the Farmington Country Club on Thursday evening, May 15th, for members of the Society. A vote of thanks was adopted by the Society in appreciation of the hospitality of the Hartford Companies.

Upon motion, the meeting adjourned at 5 P. M.

INVITED GUESTS PRESENT AT THE MEETING

HON. JOHN C. BLACKALL, Insurance Commissioner, Hartford, Connecticut.

ALVIN F. COMSTOCK, Rating Engineer, Century Indemnity Company, Hartford, Conn.

H. E. CURRY, Actuary, Farm Bureau Insurance Companies, Columbus, Ohio.

JOSEPH H. FOREST, Associate Actuary, Liberty Mutual Insurance Company, Boston, Mass.

E. A. GIDDINGS, Asst. Secretary, Aetna Life Insurance Company, Hartford, Conn.

HON. CHARLES F. J. HARRINGTON, Insurance Commissioner, Boston, Mass.

R. E. HATFIELD, Assistant Manager, Massachusetts Rating & Inspection Bureau, Boston, Mass.

P. H. MAY, Vice President and Comptroller, Maryland Casualty Company, Baltimore, Md.

RAY McKENZIE, Manager, Fidelity & Deposit Company, Hartford, Conn.

LESLIE W. SANDERS, Supervisor, Aetna Life and Affiliated Companies, Hartford, Conn.

C. L. SCHLIER, Statistician, Compensation Rating & Inspection Bureau of New Jersey, Newark, N. J.

F. B. SCHROETER, Underwriter, Zurich General Accident & Liability Insurance Company, 80 John Street, New York.

CATALOGUE OF THE LIBRARY OF THE CASUALTY ACTUARIAL SOCIETY

An asterisk (*) indicates that the work is included in the reading list of the current edition of "Recommendations for Study." Most of the abbreviations used are familiar. The following are specifically explained:

I.A.S.G. — Insurance and Actuarial Society of Glasgow.
I.L.O. — International Labour Office.
J.I.A. — Journal of Institute of Actuaries.
(P.)C.A.S. — (Proceedings) Casualty Actuarial Society.
(T.)A.S.A. — (Transactions) Actuarial Society of America.
(P) — Indicates Paper Bound.

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Cammack, E. E.: Vol. II, No. 4.
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Downey, E. H.: Vol. II, No. 4.
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Fisher, A.: Vol. II, No. 6.
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Kormes, M.: Vol. XXIII, No. 47.
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Michelbacher, G. F.: Vol. II, No. 4.
Mowbray, A. H.: Vol. I, No. 1.
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Mowbray, A. H. and Black, S. B.: Vol. II, No. 6.
Olifiers, E.: Vol. II, No. 5.
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Scattergood, C. E.: Vol. II, No. 5.
Senior, L. S.: Vol. XXIII, No. 48 and Vol. XXIV, No. 49.
Speed, B.: Vol. II, No. 4.
Wilson, H. M.: Vol. II, No. 4.
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Corrected to February 1, 1941 **No. 20**

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" appear in *Proceedings* No. 54.

The lower grade of membership in the Society is that of Associate. No candidate will be permitted to present himself for any part of the Fellowship Examination unless he has previously passed, or shall concurrently present himself for and submit papers for, all parts of the Associateship Examination and all preceding parts of the Fellowship Examination. Examinations have been held every year since organization; they are held on the third Wednesday and following Thursday in May, in various cities in the United States and Canada. The membership of the Society consists of actuaries, statisticians, and executives who are connected with the principal casualty companies and organizations in the United States and Canada. The Society has a total membership of 305, consisting of 175 Fellows and 130 Associates.

The annual meeting of the Society is held in New York in November and the semi-annual meeting is held in May. The twenty-fifth anniversary of the Society was appropriately celebrated in New York on November 16 and 17, 1939.

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

CASUALTY ACTUARIAL SOCIETY

NOVEMBER 15, 1940

THE COUNCIL

**Officers:* SYDNEY D. PINNEY.....*President*
HAROLD J. GINSBURGH.....*Vice-President*
JAMES A. CAHILL.....*Vice-President*
RICHARD FONDILLER.....*Secretary-Treasurer*
CLARENCE W. HOBBS.....*Editor*
THOMAS O. CARLSON.....*Librarian*

†*Ex-President:* FRANCIS S. PERRYMAN.....1944

†*Ex-Vice-Presidents:* HARMON T. BARBER.....1944
WILLIAM J. CONSTABLE.....1944

†*Elected:* ARTHUR E. CLEARY.....1941
ROBERT V. SINNOTT.....1941
EMMA C. MAYCRINK.....1941
NELS M. VALERIUS.....1942
JOHN A. MILLS.....1942
ALBERT Z. SKELDING.....1942
RUSSELL P. GODDARD.....1943
PAUL DORWEILER.....1943
CHARLES M. GRAHAM.....1943

*Terms expire at the annual meeting in November 1941.
†Terms expire at the annual meeting in November of the year given.

COMMITTEES

COMMITTEE ON ADMISSIONS

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GUSTAV F. MICHELBACHER
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JOHN A. MILLS

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HARRY V. WILLIAMS
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JOHN A. MILLS
SEYMOUR E. SMITH

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PAUL DORWEILER
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RICHARD FONDILLER (*ex-officio*)

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CLARENCE A. KULP
WILLIAM A. WILLIAMSON

MEMBERSHIP OF THE SOCIETY, NOVEMBER 15, 1940

FELLOWS

Those marked (†) were Charter Members at date of organization, November 7, 1914.

Those marked (*) have been admitted as Fellows upon examination by the Society.

Date Admitted	
*Nov. 21, 1930	AINLEY, JOHN W., The Travelers Insurance Company, 700 Main Street, Hartford, Conn.
*Nov. 13, 1931	AULT, GILBERT E., Actuary, Church Pension Fund and Church Life Insurance Corporation, 20 Exchange Place, New York.
May 23, 1924	BAILEY, WILLIAM B., Economist, The Travelers Insurance Company, 700 Main Street, Hartford, Conn.
*Nov. 20, 1924	BARBER, HARMON T., Assistant Actuary, Casualty Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
*Nov. 18, 1932	BARTER, JOHN L., Secretary, Hartford Accident & Indemnity Co., Hartford, Conn.
*Nov. 13, 1931	BATHO, ELGIN R., Assistant Actuary, Equitable Life Insurance Company of Canada, Waterloo, Ontario, Canada.
†	BENJAMIN, ROLAND, Treasurer, Fidelity & Deposit Company of Maryland and American Bonding Company, Baltimore, Md.
*Nov. 22, 1934	BERKELEY, ERNEST T., Superintendent, Actuarial Department, Employers Liability Assurance Corporation, Boston, Mass.
†	BLACK, S. BRUCE, President, Liberty Mutual Insurance Company, 175 Berkeley Street, Boston, Mass.
Apr. 20, 1917	BLANCHARD, RALPH H., Professor of Insurance, School of Business, Columbia University, New York.
May 24, 1921	BOND, EDWARD J., President, Maryland Casualty Company, Baltimore, Md.
†	BREIBY, WILLIAM, Vice-President, Pacific Mutual Life Insurance Company, Los Angeles, Cal.
*Nov. 18, 1927	BROWN, F. STUART, Statistician, Indemnity Insurance Co. of North America, 1600 Arch St., Philadelphia, Pa.
Oct. 22, 1915	BROWN, HERBERT D., (Retired), Glenora, Yates County, New York.
†	BUCK, GEORGE B., Consulting Actuary for Pension Funds, 150 Nassau Street, New York.
*Nov. 18, 1932	BURHANS, CHARLES H., Standard Accident Insurance Company, 640 Temple Avenue, Detroit, Mich.

FELLOWS

Date Admitted	
Apr. 20, 1917	BURHOP, WILLIAM H., Executive Vice-President, Employers Mutual Liability Insurance Company, Wausau, Wis.
*Nov. 23, 1928	BURLING, WILLIAM H., Assistant Actuary, The Travelers Insurance Company, 700 Main Street, Hartford, Conn.
*Nov. 19, 1929	CAHILL, JAMES M., Actuary, Compensation Insurance Rating Board, 125 Park Avenue, New York.
*Nov. 18, 1932	CAMERON, FREELAND R., Assistant Manager, Automobile Department, American Surety Company, 100 Broadway, New York.
†	CAMMACK, EDMUND E., Vice-President and Actuary, Aetna Life Insurance Company, Hartford, Conn.
*Nov. 17, 1938	CARLETON, JOHN W., State Compensation Insurance Fund, 450 McAllister Street, San Francisco, Calif.
*Nov. 21, 1930	CARLSON, THOMAS O., Assistant Actuary, National Bureau of Casualty & Surety Underwriters, 60 John Street, New York.
†	CARPENTER, RAYMOND V., (Retired), 66 Park Avenue, New York.
*Nov. 13, 1936	CLEARY, ARTHUR E., Actuary, Massachusetts Insurance Department, 100 Nashua Street, Boston, Mass.
*Nov. 15, 1918	COATES, BARRETT N., Coates and Herfurth, Consulting Actuaries, 582 Market Street, San Francisco, Calif.
*Nov. 17, 1922	COATES, CLARENCE S., Assistant Secretary, Lumbermen's Mutual Casualty Company, Mutual Insurance Bldg., Chicago, Ill.
Oct. 27, 1916	COGSWELL, EDMUND S., First Deputy Commissioner of Insurance, 100 Nashua Street, Boston, Mass.
Feb. 19, 1915	COLLINS, HENRY, Manager and Attorney, Ocean Accident & Guarantee Corporation and President, Columbia Casualty Company, 1 Park Avenue, New York.
*Nov. 23, 1928	COMSTOCK, W. PHILLIPS, Statistician, London Guarantee & Accident Company, 55 Fifth Avenue, New York.
*Nov. 22, 1934	CONSTABLE, WILLIAM J., Secretary, Lumbermens Mutual Casualty Company, 342 Madison Avenue, New York.
*Nov. 22, 1934	COOK, EDWIN A., Assistant Secretary, Interboro Mutual Indemnity Insurance Company, 270 Madison Avenue, New York.
†	COPELAND, JOHN A., Consulting Actuary, Candler Building, Atlanta, Ga.
*Nov. 18, 1925	CORCORAN, WILLIAM M., Consulting Actuary, c/o S. H and Lee J. Wolfe, 116 John Street, New York.
†	COWLES, WALTER G., Vice-President, The Travelers Insurance Company, 700 Main Street, Hartford, Conn.
*Nov. 19, 1926	CRANE, HOWARD G., Treasurer, General Reinsurance Corporation, 90 John Street, New York.
*Nov. 18, 1932	DAVIES, E. ALFRED, Budget Supervisor, Liberty Mutual Insurance Company, 125 Berkeley Street, Boston, Mass.
*Nov. 18, 1927	DAVIS, EVELYN M., Woodward, Ryan, Sharp & Davis, Consulting Actuaries, 90 John Street, New York.
†	DAWSON, MILES M., Consulting Actuary and Counsellor at Law, 500 Fifth Avenue, New York.

FELLOWS

Date Admitted	
†	DEARTH, ELMER H., (Retired), 1156 Lincoln Avenue, St. Paul, Minn.
†	DEKAY, ECKFORD C., President, DeKay & Company, 84 William Street, New York.
*Nov. 17, 1920	DORWEILER, PAUL, Actuary, Aetna Casualty & Surety Company, Hartford, Conn.
May 19, 1915	DUNLAP, EARL O., Third Vice President, Metropolitan Life Insurance Company, 1 Madison Avenue, New York.
*Nov. 24, 1933	EDWARDS, JOHN, Casualty Actuary, Ontario Insurance Department, 91 Arundel Avenue, Toronto, Ontario, Canada.
*Nov. 15, 1940	ELLIOTT, GEORGE B., Compensation Actuary, Pennsylvania Insurance Department, 938 Public Ledger Bldg., Philadelphia, Pa.
*Nov. 17, 1922	ELSTON, JAMES S., Assistant Actuary, Life Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
*Nov. 15, 1935	EPPINK, WALTER T., Vice-President, Merchants' Mutual Casualty Co., Casualty Insurance Building, Buffalo, New York.
†	FACKLER, EDWARD B., Consulting Actuary, Fackler & Company, 8 West 40th Street, New York.
†	FALLOW, EVERETT S., Actuary, Accident Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
*Nov. 15, 1940	FARLEY, JARVIS, Asst. Treasurer and Actuary, Massachusetts Indemnity Co., 632 Beacon Street, Boston, Mass.
†	FARRER, HENRY, National Security Fire Insurance Company, 99 John Street, New York.
*Nov. 15, 1935	FITZHUGH, GILBERT W., Assistant Actuary, Metropolitan Life Insurance Co., 1 Madison Avenue, New York.
Feb. 19, 1915	FLANIGAN, JAMES E., Agency Manager, Bankers Life Co., 225 Broadway, New York.
†	FLYNN, BENEDICT D., Vice-President and Actuary, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
Feb. 19, 1915	FONDILLER, RICHARD, Woodward and Fondiller, Consulting Actuaries, 90 John Street, New York.
†	FORBES, CHARLES S., Treasurer, Smyth, Sanford and Gerard, Inc., Insurance Brokers, 68 William Street, New York.
*Nov. 22, 1934	FULLER, GARDNER V., Secretary, National Council on Compensation Insurance, 45 East 17th Street, New York.
†	FRANKLIN CHARLES H., (Retired) 4622 East 40th St., Seattle, Washington.
*Nov. 18, 1927	FREDRICKSON, CARL H., Actuary, Canadian Underwriters Association, 55 York Street, Toronto, Canada.
†	FURZE, HARRY, (Retired), 42 Douglas Road, Glen Ridge, N. J.
Feb. 19, 1915	GARRISON, FRED S., Secretary, The Travelers Indemnity Co., 700 Main Street, Hartford, Conn.
*Nov. 20, 1924	GINSBURGH, HAROLD J., Assistant Vice-President, American Mutual Liability Insurance Co., 142 Berkeley Street, Boston, Mass.

FELLOWS

Date Admitted	
*Nov. 21, 1930	GLENN, J. BRYAN, Chief Actuary, Railroad Retirement Board, Washington, D. C.
May 19, 1915	GLOVER, JAMES W., (Retired), 620 Oxford Road, Ann Arbor, Mich.
*Nov. 13, 1931	GODDARD, RUSSELL P., American Mutual Liability Insurance Company, 142 Berkeley Street, Boston, Mass.
†	GOODWIN, EDWARD S., 750 Main Street, Hartford, Conn.
*Nov. 19, 1926	GRAHAM, CHARLES M., Associate Actuary, State Insurance Fund, 625 Madison Avenue, New York.
Oct. 22, 1915	GRAHAM, THOMPSON B., Assistant Secretary, Metropolitan Life Insurance Co., 1 Madison Avenue, New York.
†	GRAHAM, WILLIAM J., Vice-President, Equitable Life Assurance Society, 393 Seventh Avenue, New York.
May 25, 1923	GRANVILLE, WILLIAM A., Vice-President, Washington National Insurance Co., 610 Church Street, Evanston, Ill.
†	GREENE, WINFIELD W., Vice-President, General Reinsurance Corporation, 90 John Street, New York.
†	HAMILTON, ROBERT C. L., (Retired) 80 Woodrow Street, Hartford, Conn.
†	HAMMOND, H. PIERSON, Actuary, Life Actuarial Department, The Travelers Insurance Co., 700 Main St., Hartford, Conn.
Oct. 27, 1916	HARDY, EDWARD R., Secretary-Treasurer, Insurance Institute of America, Inc., 80 John Street, New York.
Oct. 22, 1915	HATCH, LEONARD W., (Retired), 425 Pelham Manor Road, Pelham Manor, New York.
*Nov. 19, 1926	HAUGH, CHARLES J., Actuary, National Bureau of Casualty & Surety Underwriters, 60 John Street, New York.
Nov. 17, 1920	HEATH, CHARLES E., Vice-President and Secretary, Standard Surety & Casualty Company of New York, 80 John Street, New York.
Nov. 21, 1919	HENDERSON, ROBERT, (Retired) Crown Point, Essex County, New York.
May 17, 1922	HERON, DAVID, Secretary and Chief Statistician, London Guarantee & Accident Co., Ltd., Phoenix House, King William Street, E.C. 4, London, England.
May 23, 1924	HOBBS, CLARENCE W., Special Representative of the National Association of Insurance Commissioners, National Council on Compensation Insurance, 45 East 17th Street, New York.
Oct. 22, 1915	HODGKINS, LEMUEL G., Secretary, Massachusetts Protective Association and Massachusetts Protective Life Assurance Co., Worcester, Mass.
†	HOFFMAN, FREDERICK L., Consulting Statistician, 3337 Elliott Street, San Diego, California.

FELLOWS

Date Admitted	
Oct. 22, 1915	HOLLAND, CHARLES H., Bennett & Palmer, 165 Broadway, New York.
*Nov. 22, 1934	HOOKER, RUSSELL O., Actuary, Connecticut Insurance Department, Hartford, Conn.
Nov. 18, 1932	HUEBNER, SOLOMON S., Professor of Insurance, University of Pennsylvania, Philadelphia, Pa.
†	HUGHES, CHARLES, Principal Insurance Report Auditor, New York Insurance Department, 80 Centre Street, New York.
Nov. 19, 1929	HULL, ROBERT S., Unemployment Compensation Division, Social Security Board, Washington, D. C.
†	HUNT, BURRITT A., Assistant Secretary, Aetna Casualty and Surety Co., Hartford, Conn.
†	HUNTER, ARTHUR, Vice-President and Chief Actuary, New York Life Insurance Co., 51 Madison Avenue, New York.
Nov. 18, 1921	HUTCHESON, WILLIAM A., Vice-President and Actuary, Mutual Life Insurance Co., 32 Nassau Street, New York.
Feb. 25, 1916	JACKSON, CHARLES W., Consulting Actuary, Woodward and Fondiller, 90 John Street, New York.
*Nov. 19, 1929	JACKSON, HENRY H., Actuary, National Life Insurance Co., Montpelier, Vt.
May 19, 1915	JOHNSON, WILLIAM C., Vice-President, Massachusetts Protective Association and Massachusetts Protective Life Assurance Co., Worcester, Mass.
Nov. 23, 1928	JONES, F. ROBERTSON, Secretary, Association of Casualty and Surety Executives; and Secretary-Treasurer, Bureau of Personal Accident and Health Underwriters, 60 John Street, New York.
*Nov. 16, 1939	JONES, HAROLD M., Liberty Mutual Insurance Company, 175 Berkeley Street, Boston, Mass.
*Nov. 17, 1938	KARDONSKY, ELSIE, Statistician, Compensation Insurance Rating Board, Pershing Square Bldg., 125 Park Avenue, New York.
Nov. 17, 1938	KELLY, GREGORY C., General Manager, Pennsylvania Compensation Rating & Inspection Bureau, 938 Public Ledger Bldg., Philadelphia, Pa.
*Nov. 19, 1926	KELTON, WILLIAM H., Assistant Actuary, Life Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
*Nov. 21, 1919	KIRKPATRICK, A. LOOMIS, Insurance Editor, Chicago Journal of Commerce, 12 East Grand Avenue, Chicago, Ill.
*Nov. 24, 1933	KORMES, MARK, Consulting Actuary, 299 Madison Avenue, New York.
Nov. 23, 1928	KULP, CLARENCE A., Professor of Insurance, University of Pennsylvania, Logan Hall, 36th Street and Woodland Avenue, Philadelphia, Pa.
Feb. 19, 1915	LAIRD, JOHN M., Vice-President and Secretary, Connecticut General Life Insurance Co., 55 Elm Street, Hartford, Conn.
Nov. 13, 1931	LA MONT, STEWART M., (Retired), 305 Sheldon Avenue, New Rochelle, New York.
*Nov. 24, 1933	LANGE, JOHN R., Chief Actuary, Wisconsin Insurance Department, State House, Madison, Wis.

FELLOWS

Date Admitted	
Nov. 17, 1922	LAWRENCE, ARNETTE R., Special Deputy Commissioner of Banking and Insurance, 1203 Military Park Building, 60 Park Place, Newark, N. J.
†	LEAL, JAMES R., Vice-President and Secretary, Interstate Life and Accident Co., Interstate Building, 540 McCallie Avenue, Chattanooga, Tenn.
†	LESLIE, WILLIAM, General Manager, National Bureau of Casualty & Surety Underwriters, 60 John Street, New York.
*Nov. 20, 1924	LINDER, JOSEPH, Consulting Actuary, c/o S. H. and Lee J. Wolfe, 116 John Street, New York.
Nov. 23, 1928	LUNT, EDWARD C., Vice-President, Great American Indemnity Co., 1 Liberty Street, New York. (Deceased January 13, 1941.)
*Nov. 13, 1936	LYONS, DANIEL J., Chief Assistant Actuary, New Jersey Department of Banking and Insurance, Trenton, N. J.
†	MAGOUN, WILLIAM N., General Manager, Massachusetts Rating and Inspection Bureau, 89 Broad Street, Boston, Mass.
*Nov. 23, 1928	MARSHALL, RALPH M., Assistant Actuary, National Council on Compensation Insurance, 45 East 17th Street, New York.
*Nov. 18, 1927	MASTERSON, Norton E., Vice-President and Actuary, Hardware Mutual Casualty Co., Stevens Point, Wis.
*Nov. 19, 1926	MATTHEWS, ARTHUR N., The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
May 19, 1915	MAYCRINK, EMMA C., Examiner, New York Insurance Department, 80 Centre Street, New York.
*Nov. 16, 1923	MCCLURG, D. RALPH, Secretary and Treasurer, National Equity Life Insurance Co., Little Rock, Ark.
*Nov. 15, 1935	MCCONNELL, MATTHEW H., JR., 1465 Hempstead Road, Penn Wynne, Pa.
May 23, 1919	MCDOUGALD, ALFRED, Ellerslie, Beddington Gardens, Wallington Surrey, England.
*Oct. 31, 1917	MCMANUS, Robert J., Statistician, Casualty Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
†	MICHELBACHER, GUSTAV F., Vice-President and Secretary, Great American Indemnity Co., 1 Liberty Street, New York.
*Nov. 17, 1938	MILLER, JOHN H., Vice President and Actuary, Monarch Life Insurance Company, Springfield, Mass.
†	MILLIGAN, SAMUEL, Second Vice-President, Metropolitan Life Insurance Co., 1 Madison Avenue, New York.
*Nov. 18, 1937	MILLS, JOHN A., Secretary and Actuary, Lumbermens Mutual Casualty Co., and American Motorists Insurance Co., Mutual Insurance Bldg., Chicago, Ill.
†	MITCHELL, JAMES F., U. S. Manager, General Accident Fire and Life Assurance Corporation, Ltd., 414 Walnut Street, Philadelphia, Pa. (Deceased February 9, 1941.)
*Nov. 18, 1921	MONTGOMERY, VICTOR, President, Pacific Employers Insurance Co., 1033 So. Hope Street, Los Angeles, Calif.
Nov. 19, 1926	MOONEY, WILLIAM L., (Retired), 4 Pleasant Street, West Hartford, Conn.

FELLOWS

Date Admitted	
†	MOORE, GEORGE D., Comptroller, Standard Surety & Casualty Company of New York, 80 John Street, New York.
†	MOWBRAY, ALBERT H., Consulting Actuary, 806 San Luis Road, Berkeley, Calif.
*Nov. 17, 1920	MUELLER, LOUIS H., President, Associated Insurance Fund, 332 Pine Street, San Francisco, Calif.
†	MULLANEY, FRANK R., Vice-President and Secretary, American Mutual Liability Insurance Co., and Secretary, American Policyholders' Insurance Co., 142 Berkeley Street, Boston, Mass.
May 28, 1920	MURPHY, RAY D., Vice-President and Actuary, Equitable Life Assurance Society, 393 Seventh Avenue, New York.
*Nov. 15, 1935	OBERHAUS, THOMAS M., Office of Woodward and Fondiller, Consulting Actuaries, 90 John Street, New York.
†	OLIFIERS, EDWARD, Actuary and Managing Director, Previdencia do Sul, Caixa Postal 76, Porto Alegre, Brazil.
Nov. 18, 1927	O'NEILL, FRANK J., President, Royal Indemnity Co., and Eagle Indemnity Co., 150 William Street, New York.
†	ORR, ROBERT K., President, Wolverine Insurance Co., Lansing, Mich.
*Nov. 21, 1919	OUTWATER, OLIVE E., Actuary, Benefit Association of Railway Employees, 901 Montrose Avenue, Chicago, Ill.
Nov. 19, 1926	PAGE, BERTRAND A., Vice-President, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
*Nov. 18, 1921	PERKINS, SANFORD B., Secretary, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
Nov. 15, 1918	PERRY, W. T., Deputy Manager, Ocean Accident and Guarantee Corporation, 36 Moorgate, London, E. C. 2, England.
*Nov. 21, 1930	PERRYMAN, FRANCIS S., Secretary and Actuary, Royal Indemnity Co., and Eagle Indemnity Co., 150 William Street, New York.
Nov. 19, 1926	PHILLIPS, JESSE S., Chairman of Board, Great American Indemnity Co., 1 Liberty Street, New York.
*Nov. 24, 1933	PICKETT, SAMUEL C., Assistant Actuary, Connecticut Insurance Department, Hartford, Conn.
*Nov. 17, 1922	PINNEY, SYDNEY D., Associate Actuary, Casualty Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
*Nov. 13, 1931	PRUITT, DUDLEY M., Statistician, Fireman's Fund Indemnity Co., 116 John Street, New York.
May 23, 1919	RICHARDSON, FREDERICK, Deputy Chairman of the Board, General Accident Fire and Life Assurance Corporation, Perth, Scotland.
*Nov. 19, 1926	RICHTER, OTTO C., American Telephone & Telegraph Co., 195 Broadway, New York.

FELLOWS

Date Admitted	
May 24, 1921	RIEGEL, ROBERT, Professor of Statistics and Insurance, University of Buffalo, Buffalo, New York.
*Nov. 16, 1939	ROBBINS, RAINARD B., Vice President and Secretary, Teachers Insurance and Annuity Association, 522 Fifth Avenue, New York.
*Nov. 16, 1923	ROEBER, WILLIAM F., General Manager, National Council on Compensation Insurance, 45 East 17th Street, New York.
†	SCHEITLIN, EMIL, Treasurer, Globe Indemnity Co., 150 William Street, New York.
*Nov. 18, 1937	SHAPIRO, GEORGE I., First Vice President and General Manager, Public Service Mutual Casualty Ins. Corp., 342 Madison Avenue, New York.
*Nov. 13, 1931	SILVERMAN, DAVID, c/o S. H. & Lee J. Wolfe, 116 John Street, New York.
*Nov. 24, 1933	SINNOTT, ROBERT V., Hartford Accident and Indemnity Company, 690 Asylum Avenue, Hartford, Conn.
*Nov. 19, 1929	SKELDING, ALBERT Z., Actuary, National Council on Compensation Insurance, 45 East 17th Street, New York.
*Nov. 19, 1929	SKILLINGS, EDWARD S., Asst. Comptroller, Allstate Insurance Co., Allstate Fire Insurance Co., 20 North Wacker Drive, Chicago, Ill.
*Nov. 18, 1932	SMICK, JACK J., National Council on Compensation Insurance, 45 East 17th Street, New York.
*Nov. 15, 1940	SMITH, SEYMOUR E., Casualty Actuarial Department, Travelers Insurance Co., Hartford, Conn.
*Nov. 24, 1933	ST. JOHN, JOHN B., Social Security Board, Bureau of Old Age Insurance, Washington, D. C.
Nov. 18, 1927	STONE, EDWARD C., U. S. General Manager and Attorney, Employers' Liability Assurance Corporation, Limited, and President, American Employers' Insurance Company, 110 Milk Street, Boston, Mass.
Feb. 25, 1916	STRONG, WENDELL M., Associate Actuary, Mutual Life Insurance Co., 32 Nassau Street, New York.
Oct. 22, 1915	STRONG, WILLIAM RICHARD, No. 4 "Sheringham," Cotham Road, Kew, Victoria, Australia.
*Nov. 17, 1920	TARBELL, THOMAS F., Actuary, Casualty Actuarial Department. The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
†	THOMPSON, JOHN S., Vice-President and Mathematician, Mutual Benefit Life Insurance Co., 300 Broadway, Newark N. J.
†	TRAIN, JOHN L., President and General Manager, Utica Mutual Insurance Co., 185 Genesee Street, Utica, New York.
Nov. 17, 1922	TRAVERSI, ANTONIO T., Consulting Actuary and Accountant, London Bank Chambers, Martin Place, Sydney, Australia.
*Nov. 23, 1928	VALERIUS, NELS M., Accident & Liability Department, Aetna Life Insurance Co., Hartford, Conn.
*Nov. 21, 1919	VAN TUYL, HIRAM O., Supt., Accounts Department, London Guarantee & Accident Co., 55 Fifth Avenue, New York.

FELLOWS

Date Admitted	
*Nov. 17, 1920	WAITE, ALAN W., Assistant Secretary, Accident and Liability Department, Aetna Life Insurance Co., Hartford, Conn.
*Nov. 15, 1935	WAITE, HARRY V., Statistician, The Travelers Fire Insurance Co., 700 Main Street, Hartford, Conn.
*Nov. 18, 1925	WARREN, LLOYD A. H., Professor of Actuarial Science, University of Manitoba, 64 Niagara Street, Winnipeg, Manitoba, Canada.
†	WHITNEY, ALBERT W., Consulting Director, National Conservation Bureau, Association of Casualty & Surety Executives, 60 John Street, New York.
*Nov. 15, 1935	WILLIAMS, HARRY V., Rating & Research Dept., Hartford Accident and Indemnity Co., Hartford, Conn.
*Nov. 13, 1931	WITTICK, HERBERT E., Secretary, Pilot Insurance Co., 199 Bay Street, Toronto, Canada.
†	WOLFE, LEE J., Consulting Actuary, 116 John Street, New York.
May 24, 1921	WOOD, ARTHUR B., President and Managing Director, Sun Life Assurance Company of Canada, Montreal, Canada.

ASSOCIATES

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

Numerals indicate Fellowship examination parts credited.

Date Enrolled	
May 23, 1924	ACKER, MILTON, Manager, Compensation and Liability Department, National Bureau of Casualty and Surety Underwriters, 60 John Street, New York.
*Nov. 15, 1918	ACKERMAN, SAUL B., Professor of Insurance, New York University, 90 Trinity Place, New York.
*Nov. 16, 1939	AIN, SAMUEL N., Office of George B. Buck, Consulting Actuary for Pension Funds, 150 Nassau Street, New York.
Apr. 5, 1928	ALLEN, AUSTIN F., President and General Manager, Texas Employers Insurance Association and Employers Casualty Co., Dallas, Texas.
Nov. 15, 1918	ANKERS, ROBERT E., Secretary and Treasurer, Continental Life Insurance Co., Investment Building, Washington, D. C.
*Nov. 21, 1930	ARCHIBALD, A. EDWARD, Actuary, Volunteer State Life Insurance Company, Chattanooga, Tenn. (I, II.)
*Nov. 16, 1939	BAILEY, ARTHUR L., Statistician, American Mutual Alliance, 60 E. 42nd Street, New York.
*Nov. 24, 1933	BARRON, JAMES C., General Reinsurance Corporation, 90 John Street, New York. (I, II, IV.)
*Nov. 23, 1928	BATEMAN, ARTHUR E., Liberty Mutual Insurance Company, 175 Berkeley Street, Boston, Mass. (I, II.)
*Nov. 15, 1940	BATHO, BRUCE, Asst. Actuary, Illinois Insurance Department, Springfield, Illinois.
*Nov. 18, 1925	BITTEL, W. HAROLD, Associate Actuary, Woodward, Ryan, Sharp, & Davis, 90 John Street, New York.
Nov. 17, 1920	BLACK, NELLAS C., Statistician, Maryland Casualty Co., Baltimore, Md.
*Nov. 15, 1940	BALCKHALL, JOHN M., Monarch Life Insurance Co., Springfield, Mass.
*Nov. 22, 1934	BOMSE, EDWARD L., National Bureau of Casualty & Surety Underwriters, 60 John Street, New York.
*Nov. 23, 1928	BOWER, PERRY S., Great West Life Assurance Company, Winnipeg, Manitoba, Canada.
*Nov. 15, 1935	BRERETON, CLOUDESLEY R., Dominion Department of Insurance, Ottawa, Ontario, Canada.
*Nov. 15, 1918	BRUNNQUELL, HELMUTH G., Assistant Actuary, The Northwestern Mutual Life Insurance Co., Milwaukee, Wis.
*Oct. 22, 1915	BUFFLER, LOUIS, Director, Underwriting Department, State Insurance Fund, 625 Madison Avenue, New York.
*Nov. 20, 1924	BUGBEE, JAMES M., Asst. Manager, Automobile Department, Maryland Casualty Co., Baltimore, Md.
Mar. 31, 1920	BURT, MARGARET A., Office of George B. Buck, Consulting Actuary, 150 Nassau Street, New York.
Nov. 17, 1922	CAVANAUGH, LEO D., President, Federal Life Insurance Co., 168 N. Michigan Avenue, Chicago, Ill.

ASSOCIATES

Date Enrolled	
*Nov. 18, 1927	CHEN, S. T., Actuary, China United Assurance Society, 104 Bubbling Well Road, Shanghai, China.
*Nov. 18, 1927	CONROD, STUART F., Actuary, Loyal Protective Life Insurance Co., Co., 19 Fairfield Street, Boston, Mass.
*Nov. 24, 1933	CRAWFORD, WILLIAM H., Assistant Secretary, Fireman's Insurance Co. of Newark, N. J. & Affiliated Fire & Casualty Co's Western Dept., 844 Rush Street, Chicago, Ill. (I, II.)
*Nov. 18, 1932	CRIMMINS, JOSEPH B., Metropolitan Life Insurance Co., 1 Madison Avenue, New York. (I, II.)
*Nov. 18, 1925	DAVIS, MALVIN E., Associate Actuary, Metropolitan Life Insurance Co., 1 Madison Avenue, New York.
*Nov. 24, 1933	DAVIS, REGINALD S., Assistant Comptroller, State Compensation Insurance Fund, San Francisco, Calif. (I, II.)
May 25, 1923	ECONOMIDY, HARILAUS E., Vice President and Comptroller, United Employees Casualty Co., Southern Underwriters Bldg., Houston, Texas.
June 5, 1925	EGER, FRANK A., Secretary-Comptroller, Insurance Company of North America and Affiliated Companies, 1600 Arch Street, Philadelphia, Pa.
*Nov. 16, 1923	FITZ, L. LEROY, Group Insurance Department, Equitable Life Assurance Society, 393 Seventh Avenue, New York. (I, II.)
*Nov. 18, 1927	FITZGERALD, AMOS H., Assistant Actuary, The Prudential Insurance Company of America, Newark, N. J. (I, II.)
*Nov. 16, 1923	FLEMING, FRANK A., Actuary, American Mutual Alliance, 60 East 42nd Street, New York.
Nov. 20, 1924	FROBERG, JOHN, Manager, California Inspection Rating Bureau, 114 Sansome Street, San Franciso, Calif.
*Nov. 13, 1936	FRUECHTEMEYER, FRED J., Liberty Mutual Insurance Co., 175 Berkeley Street, Boston, Mass. (I, II.)
*Nov. 19, 1929	FURNIVALL, MAURICE L., Assistant Actuary, Accident Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn. (I, II.)
*Nov. 22, 1934	GATELY, JOHN J., General Reinsurance Corporation, 90 John Street, New York. (I, II.)
*Nov. 18, 1932	GETMAN, RICHARD A., Life Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn. (I, II.)
*Nov. 17, 1922	GIBSON, JOSEPH P., JR., President and General Manager, Excess Underwriters, Inc., 90 John Street, New York.
*Nov. 16, 1923	GILDEA, JAMES F., The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
Nov. 19, 1929	GORDON, HAROLD R., Executive Secretary, Health & Accident Underwriters Conference, 176 West Adams Street, Chicago, Ill.
*Nov. 18, 1927	GREEN, WALTER C., Consulting Actuary, 211 West Wacker Drive, Chicago, Ill.
*Nov. 15, 1940	GROSSMAN ELI A., United States Life Insurance Co., 101 Fifth Avenue, New York.
*Nov. 15, 1935	GUERTIN, A. N., Actuary, New Jersey Department of Banking and Insurance, Trenton, N. J. (I, II.)
*Nov. 16, 1939	HAGEN, OLAF E., Metropolitan Life Insurance Company, 1 Madison Avenue, New York.
*Nov. 18, 1921	HAGGARD, ROBERT E., Superintendent, Permanent Disability Rating Department, Industrial Accident Commission, State Building, San Francisco, Calif.

ASSOCIATES

Date Enrolled	
*Nov. 17, 1922	HALL, HARTWELL L., Associate Actuary, Connecticut Insurance Department, Hartford, Conn.
*Nov. 13, 1936	HAM, HUGH P., British America Assurance Co., 807 Electric Railway Chambers, Winnipeg, Manitoba, Canada. (I,II.)
Mar. 24, 1932	HARRIS, SCOTT, Vice-President, Joseph Froggatt & Co., 74 Trinity Place, New York.
*Mar. 25, 1924	HART, WARD VAN BUREN, Assistant Actuary, Connecticut General Life Insurance Co., Hartford, Conn. (I, II.)
Nov. 21, 1919	HAYDON, GEORGE F., General Manager, Wisconsin Compensation Rating & Inspection Bureau, 715 N. Van Buren Street, Milwaukee, Wis.
Nov. 17, 1927	HIPP, GRADY H., Actuary, State Insurance Fund, 625 Madison Avenue, New York.
Nov. 19, 1929	JACOBS, CARL N., President, Hardware Mutual Casualty Co., Stevens Point, Wis.
*Nov. 18, 1921	JENSEN, EDWARD S., Asst. Secretary, Occidental Life Insurance Co., Los Angeles, Calif. (III, IV.)
*Nov. 15, 1940	JOHNSON, ROGER A., JR., Compensation Insurance Rating Board, 125 Park Avenue, New York.
Nov. 21, 1930	JONES, H. LLOYD, Deputy General Attorney, of Phoenix-London Group, Vice-President, Phoenix Indemnity Company, and Deputy United States Manager, London Accident & Guarantee Co., 55 Fifth Avenue, New York.
*Nov. 21, 1919	JONES, LORING D., Assistant Director, State Insurance Fund, 625 Madison Avenue, New York.
*Nov. 15, 1940	KELLY, ROBERT G., New Amsterdam Casualty Co., 432-34 Chestnut St., Philadelphia, Pa.
*Nov. 17, 1922	KIRK, CARL L., Assistant U. S. Manager, Zurich General Accident & Liability Insurance Co., 135 South LaSalle Street, Chicago, Ill.
*Nov. 15, 1935	KITZROW, E. W., Vice-President, Hardware Mutual Casualty Co., Stevens Point, Wis. (I, II.)
*Nov. 16, 1939	KNOWLES, FREDERICK, Commercial Union Assurance Co., Ltd., 388 St. James Street, West, Montreal, Canada.
*Nov. 18, 1937	KOLODITZKY, MORRIS, State Insurance Fund, 625 Madison Avenue, New York. (I, II, III.)
*Nov. 18, 1937	LASSOW, WILLIAM, Statistician, Board of Transportation of the City of New York, 250 Hudson Street, New York. (I.)
*Nov. 17, 1938	LIEBLEIN, JULIUS, 2095 Honeywell Ave., Bronx, New York.
*Nov. 13, 1931	MACKEEN, HAROLD E., The Travelers Insurance Co., 700 Main Street, Hartford, Conn. (I, II.)
Mar. 24, 1932	MAGRATH, JOSEPH J., Executive Assistant, Chubb & Sons, 90 John Street, New York.
*Nov. 18, 1925	MALMUTH, JACOB, Examiner, New York Insurance Department, 80 Centre Street, New York.
Mar. 24, 1927	MARSH, CHARLES V. R., Comptroller and Assistant Treasurer, Fidelity & Deposit Co. and American Bonding Co., Baltimore, Md.
*Nov. 13, 1936	MAYER, WILLIAM H., JR., Actuarial Department, Metropolitan Life Insurance Co., 1 Madison Avenue, New York.
*Nov. 17, 1922	MCIVER, ROSSWELL A., Actuary, Washington National Insurance Co., 610 Church Street, Evanston, Ill.

ASSOCIATES

Date Enrolled	
*Nov. 17, 1922	MICHENER, SAMUEL M., Assistant Actuary, Columbus Mutual Life Insurance Co., 580 East Broad Street, Columbus, Ohio, (I, II.)
*Nov. 13, 1931	MILLER, HENRY C., Comptroller, State Compensation Insurance Fund, 450 McAllister Street, San Francisco, Calif. (I, II.)
*Nov. 19, 1926	MILNE, JOHN L., Actuary, Presbyterian Ministers' Fund for Life Insurance, 1805 Walnut Street, Philadelphia, Pa.
*Nov. 18, 1937	MINOR, EDUARD H., Actuarial Department, Metropolitan Life Insurance Company, 1 Madison Avenue, New York.
Nov. 17, 1922	MONTGOMERY, JOHN C., Secretary and Assistant Treasurer, Bankers Indemnity Insurance Co., 15 Washington Street, Newark, N. J.
May 25, 1923	MOORE, JOSEPH P., President, North American Accident Insurance Co., 455 Craig Street, W., Montreal, Canada.
*Nov. 21, 1919	MOTHERSILL, ROLLAND V., President, Anchor Casualty Co., Anchor Insurance Building, 758 So. Mississippi River Boulevard, St. Paul, Minn. (III, IV.)
*Nov. 18, 1937	MYERS, ROBERT J., Actuarial Mathematician, Social Security Board, Washington, D. C.
*Nov. 19, 1929	MULLER, FRITZ, Director, Agrippina Life Insurance Stock Co., Berlin, W. 30 Mackensenstr. 16, Germany.
*Nov. 15, 1935	NELSON, S. TYLER, Utica Mutual Insurance Co., 185 Genesee Street, Utica, New York.
*Oct. 27, 1916	NEWELL, WILLIAM, Secretary, Assigned Risk Pool, 60 John Street, New York. (I, II.)
*Nov. 23, 1928	NEWHALL, KARL, Group Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
*Nov. 18, 1925	NICHOLSON, EARL H., Actuary, Joseph Froggatt & Co., 74 Trinity Place, New York.
May 23, 1919	OTTO, WALTER E., President, Michigan Mutual Liability Co., 163 Madison Avenue, Detroit, Mich.
*Nov. 19, 1926	OVERHOLSER, DONALD M., Office of George B. Buck, Consulting Actuary for Pension Funds, 150 Nassau Street, New York.
Nov. 20, 1924	PENNOCK, RICHARD M., Actuary, Pennsylvania Manufacturer, Association Casualty Insurance Co., Finance Building, Philadelphia, Pa.
*Nov. 15, 1940	PETERS, STEFAN, Compensation Insurance Rating Board, 125 Park Avenue, New York.
Nov. 19, 1929	PHILLIPS, JOHN H., Vice-President and Actuary, Employers' Mutual Liability Insurance Co., Wausau, Wis.
*Nov. 17, 1920	PIKE, MORRIS, Vice-President and Actuary, Union Labor Life Insurance Co., 570 Lexington Avenue, New York.
*Nov. 23, 1928	PIPER, KENNETH B., Actuary, Provident Life and Accident Insurance Co., Chattanooga, Tenn. (I, II.)
*Nov. 18, 1927	POISSANT, WILLIAM A., The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
*Nov. 17, 1922	POORMAN, WILLIAM F., Vice-President and Actuary, Central Life Assurance Society, Fifth and Grand Avenues, Des Moines, Iowa. (I, II.)
*Nov. 13, 1936	POTOFSKY, SYLVIA, State Insurance Fund, 625 Madison Avenue. New York. (I.)

ASSOCIATES

Date Enrolled	
Nov. 17, 1922	POWELL, JOHN M., President, Loyal Protective Insurance Co. and Loyal Life Insurance Co., 19 Deerfield Street, Boston, Mass. (I, II.)
*Nov. 15, 1918	RAYWID, JOSEPH, President, Joseph Raywid & Co., Inc., 92 William Street, New York.
Nov. 19, 1932	RICHARDSON, HARRY F., Secretary-Treasurer, National Council on Compensation Insurance, 45 East 17th Street, New York.
*Nov. 18, 1932	ROBERTS, JAMES A., Life Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn. (I, II.)
*Nov. 15, 1940	ROSENBERG, NORMAN, Department of Banking and Insurance, Trenton, New Jersey.
*Nov. 18, 1927	SARASON, HARRY M., Assistant Actuary, General American Life Insurance Co., 1501 Locust Street, St. Louis, Mo.
Nov. 16, 1923	SAWYER, ARTHUR, Globe Indemnity Co., 150 William Street, New York.
*Nov. 20, 1930	SEVILLA, EXEQUIEL S., Actuary, National Life Insurance Co., P. O. Box 2856, Manila, Philippine Islands.
*Nov. 20, 1924	SHEPPARD, NORRIS E., Lecturer in Mathematics and Mechanics, University of Toronto, Toronto, Canada. (I, II.)
Nov. 15, 1918	SIBLEY, JOHN L., Assistant Secretary, United States Casualty Co., 60 John Street, New York.
*Nov. 18, 1921	SMITH, ARTHUR G., Assistant General Manager, Compensation Insurance Rating Board, Pershing Square Bldg., 125 Park Avenue, New York.
*Nov. 19, 1926	SOMERVILLE, WILLIAM F., Assistant Secretary, St. Paul Mercury Indemnity Co., St. Paul, Minn. (I, II.)
*Nov. 18, 1925	SOMMER, ARMAND, Assistant to Vice-President, Continental Casualty Co., 910 So. Michigan Avenue, Chicago, Ill.
*Nov. 18, 1927	SPEERS, ALEXANDER A., Secretary and Actuary, Michigan Life Insurance Co., Detroit, Mich.
*Nov. 15, 1918	SPENCER, HAROLD S., Aetna Life Insurance Co., Hartford, Conn.
Nov. 20, 1924	STELLWAGEN, HERBERT P., Vice-President, Indemnity Insurance Company of North America, 1600 Arch Street, Philadelphia, Pa.
*Nov. 16, 1939	STELSON, HUGH E., Professor of Mathematics, Kent State University, Kent, Ohio.
*Nov. 16, 1923	STOKE, KENDRICK, Actuary, Michigan Mutual Liability Company, 163 Madison Avenue, Detroit, Mich.
*Nov. 21, 1930	SULLIVAN, WALTER F., Associated Indemnity Corporation, 332 Pine Street, San Francisco, Calif. (I, II.)
Mar. 23, 1921	THOMPSON, ARTHUR E., Chief Statistician, Globe Indemnity Co., 150 William Street, New York.
*Nov. 21, 1919	TRENCH, FREDERICK H., Manager, Underwriting Department, Utica Mutual Insurance Co., 185 Genesee Street, Utica, N. Y. (I, II.)
*Nov. 20, 1924	UHL, M. ELIZABETH, National Bureau of Casualty & Surety Underwriters, 60 John Street, New York. (I, II.)
May 23, 1919	WARREN, CHARLES S., Secretary, Massachusetts Automobile Rating and Accident Prevention Bureau, 89 Broad Street, Boston, Mass.
Nov. 18, 1925	WASHBURN, JAMES H., Actuary, 1501 Gale Lane, Nashville, Tenn.

ASSOCIATES

Date Enrolled	
*Nov. 18, 1932	WEINSTEIN, MAX S., Examiner, New York Insurance Department, 80 Centre Street, New York.
*Nov. 18, 1921	WELCH, EUGENE R., Associated Indemnity Corporation, 332 Pine Street, San Francisco, Calif.
*Nov. 18, 1925	WELLMAN, ALEXANDER C., Vice-President and Actuary, Protective Life Insurance Co., Birmingham, Ala.
*Nov. 21, 1930	WELLS, WALTER I., Supervisor of Applications, Massachusetts Protective Association, Worcester, Mass. (I, II.)
Mar. 21, 1929	WHEELER, CHARLES A., Chief Examiner of Casualty Companies, New York Insurance Department, 80 Centre Street, New York.
*Nov. 18, 1927	WHITBREAD, FRANK G., Assistant Actuary, Great West Life Assurance Co., Winnipeg, Manitoba, Canada.
*Oct. 22, 1915	WILLIAMSON, WILLIAM R., Actuarial Consultant, Social Security Board, Washington, D. C.
*Nov. 16, 1939	WITTLAKE, J. CLARKE, Actuarial Department, Business Men's Assurance Company, Kansas City, Mo.
*Oct. 22, 1915	WOOD, DONALD M., Childs & Wood, General Agents, Royal Indemnity Company, 175 W. Jackson Blvd., Chicago, Ill.
*Nov. 18, 1937	WOOD, DONALD M., JR., Childs & Wood, 175 West Jackson Blvd., Chicago, Ill.
*Nov. 18, 1927	WOOD, MILTON J., Assistant Actuary, Life Actuarial Department, The Travelers Insurance Co., 700 Main Street, Hartford, Conn.
*Oct. 22, 1915	WOODMAN, CHARLES E., Assistant Manager, Ocean Accident & Guarantee Corporation and Comptroller, Columbia Casualty Co., 1 Park Avenue, New York.
*Nov. 22, 1934	WOODWARD, BARBARA H., Examiner, New York Insurance Department, 80 Centre Street, New York.
*Nov. 18, 1925	WOOLERY, JAMES M., Actuary, North Carolina Insurance Dept., Raleigh, N. C.

SCHEDULE OF MEMBERSHIP, NOVEMBER 15, 1940

	Fellows	Associates	Total
Membership, November 16, 1939.....	180	127	307
Additions:			
By examination.....	3	7	10
	183	134	317
Deductions:			
By death.....	5	..	5
By withdrawal.....	3	1	4
By transfer from Associate to Fellow	..	3	3
Membership, November 15, 1940.....	175	130	305

OFFICERS OF THE SOCIETY

Since Date of Organization

Elected	*President*	*Vice-Presidents*	
1914–1915	*I. M. Rubinow	A. H. Mowbray	B. D. Flynn
1916–1917	*J. D. Craig	*J. H. Woodward	*H. E. Ryan
1918	*J. H. Woodward	B. D. Flynn	G. D. Moore
1919	B. D. Flynn	G. D. Moore	W. Leslie
1920	A. H. Mowbray	W. Leslie	*L. S. Senior
1921	A. H. Mowbray	*L. S. Senior	*H. E. Ryan
1922	*H. E. Ryan	G. F. Michelbacher	E. E. Cammack
1923	W. Leslie	G. F. Michelbacher	E. E. Cammack
1924–1925	G. F. Michelbacher	S. B. Perkins	R. H. Blanchard
1926–1927	S. B. Perkins	G. D. Moore	T. F. Tarbell
1928–1929	G. D. Moore	S. D. Pinney	P. Dorweiler
1930–1931	T. F. Tarbell	*R. A. Wheeler	W. W. Greene
1932–1933	P. Dorweiler	W. F. Roeber	*L. S. Senior
1934–1935	W. W. Greene	R. H. Blanchard	C. J. Haugh
1936–1937	*L. S. Senior	S. D. Pinney	F. S. Perryman
1938–1939	F. S. Perryman	H. T. Barber	W. J. Constable
1940	S. D. Pinney	H. J. Ginsburgh	J. M. Cahill

Secretary-Treasurer

1914–1917.....*C. E. Scattergood
1918–1940.....R. Fondiller

Editor†	*Librarian*†
1914.....W. W. Greene	1914.....W. W. Greene
1915–1917.....R. Fondiller	1915.....R. Fondiller
1918..... W. W. Greene	1916–1921.....L. I. Dublin
1919–1921....G. F. Michelbacher	1922–1924.....E. R. Hardy
1922–1923.....O. E. Outwater	1925–1937.....W. Breiby
1924–1932.....R. J. McManus	1937–1940.....T. O. Carlson
1933–1940.....C. W. Hobbs	

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

DECEASED FELLOWS

Date of Death	
Nov. 10, 1939	BRADSHAW, THOMAS, President, North American Life Assurance Company, Toronto, Canada.
Aug. 22, 1937	BROSMITH, WILLIAM, Vice-President and General Counsel, The Travelers Insurance Company and The Travelers Indemnity Company, Hartford, Conn.
June 4, 1934	BUDLONG, WILLIAM A., Superintendent of Claims, Commercial Travelers Mutual Accident Association, Utica, N. Y.
Mar. 30, 1935	BURNS, F. HIGHLAND, Chairman of the Board, Maryland Casualty Co., Baltimore, Md.
Feb. 4, 1920	CASE, GORDON, Office of F. J. Haight, Consulting Actuary, Indianapolis, Ind.
July 23, 1921	CONWAY, CHARLES T., Vice-President, Liberty Mutual Insurance Co., Boston, Mass.
May 27, 1940	CRAIG, JAMES D., Vice-President, Metropolitan Life Insurance Co., New York.
Jan. 20, 1922	CRAIG, JAMES MCINTOSH, Actuary, Metropolitan Life Insurance Co., New York.
Sept. 2, 1921	CRUM, FREDERICK S., Assistant Statistician, Prudential Insurance Co., Newark, N. J.
June 21, 1931	DAWSON, ALFRED BURNETT, Consulting Actuary, New York.
Jan. 18, 1929	DEUTSCHBERGER, SAMUEL, Actuary, New York Insurance Department, New York.
July 9, 1922	DOWNEY, EZEKIEL HINTON, Compensation Actuary, Pennsylvania Insurance Department, Harrisburg, Pa.
Oct. 30, 1924	FACKLER, DAVID PARKS, Consulting Actuary, New York.
July 15, 1938	FELLOWS, CLAUDE W., President, Associated Indemnity Co., San Francisco, Calif.
July 25, 1931	FRANKEL, LEE K., Second Vice-President, Metropolitan Life Insurance Co., New York.
Sept. 28. 1940	FROGGATT, JOSEPH, President, Joseph Froggatt & Co., New York.
Aug. 22, 1925	GATY, THEODORE E., Vice-President and Secretary, Fidelity & Casualty Co., New York.
April 15, 1937	GRAHAM, GEORGE, Executive Vice-President, Manhattan Life Insurance Company, New York.
Oct. 28, 1936	GOULD, WILLIAM H., Consulting Actuary, New York.
May 17, 1940	HILLAS, ROBERT J., President, Fidelity and Casualty Co., New York.
Mar. 18, 1932	HINSDALE, FRANK WEBSTER, Secretary, Workmen's Compensation Board, Vancouver, B. C., Canada.
Jan. 22, 1937	HODGES, CHARLES E., Chairman of the Board, American Mutual Liability Insurance Company, Boston, Mass.
Mar. 10, 1924	HOOKSTADT, CARL, Expert, U. S. Bureau of Labor Statistics, Washington, D. C.
Feb. 11, 1928	KEARNEY, THOMAS P., Manager, State Compensation Insurance Fund, Denver, Col.
Oct. 15, 1918	KIME, VIRGIL MORRISON, Actuary, Casualty Departments, The Travelers Insurance Co., Hartford, Conn.
Aug. 3, 1933	KOPF, EDWIN W., Assistant Statistician, Metropolitan Life Insurance Co., New York.
Dec. 9, 1927	LANDIS, ABB, Consulting Actuary, Nashville, Tenn.
Aug. 11, 1938	LITTLE, JAMES FULTON, Vice-President and Actuary, Prudential Life Insurance Company, Newark, N. J.
Nov. 29, 1933	MEAD, FRANKLIN B., Vice-President, The Lincoln National Life Insurance Co., Fort Wayne, Ind.
Mar. 27, 1931	MELTZER, MARCUS, Statistician, National Bureau of Casualty & Surety Underwriters, New York.
Jan. 18, 1936	MILLER, DAVID W., Garden City, Long Island, New York.

DECEASED FELLOWS—Continued

Date of Death	
June 8, 1937	MOIR, HENRY, Chairman of Finance Committee and Director, United States Life Insurance Company, New York.
Aug. 20, 1915	MONTGOMERY, WILLIAM J., State Actuary, Boston, Mass.
Dec. 19, 1929	MORRIS, EDWARD BONTECOU, Actuary, Life Department, The Travelers Insurance Co., Hartford, Conn.
Apr. 21, 1940	NICHOLAS, LEWIS A., Asst. Secretary, Fidelity and Casualty Co., New York.
Oct. 12, 1937	OTIS, STANLEY, Counsellor at Law, Manager, Otis Service, New York.
July 24, 1915	PHELPS, EDWARD B., Editor, The American Underwriter, New York.
July 30, 1921	REITER, CHARLES GRANT, Assistant Actuary, Metropolitan Life Insurance Co., New York.
Mar. 21, 1938	REMINGTON, CHARLES H., Pan American Casualty Company, Miami, Fla.
Sept. 1, 1936	RUBINOW, ISAAC M., Secretary, Independent Order of B'nai B'rith, Cincinnati, Ohio.
Nov. 2, 1930	RYAN, HARWOOD ELDRIDGE, Consulting Actuary, New York.
Feb. 26, 1921	SAXTON, ARTHUR F., Chief Examiner of Casualty Companies, New York Insurance Department, New York.
Feb. 3, 1940	SENIOR, LEON S., General Manager, Compensation Insurance Rating Board, New York.
June 22, 1938	SMITH, CHARLES GORDON, Manager, New York State Fund, New York.
May 9, 1920	STONE, JOHN T., President, Maryland Casualty Co., Baltimore, Md.
July 19, 1934	SULLIVAN, ROBERT J., Vice-President, The Travelers Insurance Co., and The Travelers Indemnity Co., Hartford, Conn.
May 25, 1935	THOMPSON, WALTER H., Kemper Insurance Organization, Chicago, Illinois.
Feb. 25, 1933	TOJA, GUIDO, Director General, Institute Nazionale Delle Assicurazioni, Rome, Italy.
May 8, 1935	WELCH, ARCHIBALD A., President, Phoenix Mutual Life Insurance Co., Hartford, Conn.
Aug. 26, 1932	WHEELER, ROY A., Vice-President and Actuary, Liberty Mutual Insurance Co., Boston, Mass.
Dec. 31, 1927	WOLFE, S. HERBERT, Consulting Actuary, New York.
May 15, 1928	WOODWARD, JOSEPH H., Consulting Actuary, New York.
Oct. 23, 1927	YOUNG, WILLIAM, Actuary, New York Life Insurance Co., New York.

DECEASED ASSOCIATES

Date of Death	
Feb. 10, 1920	BAXTER, DON. A., Deputy Insurance Commissioner, Michigan Insurance Department, Lansing, Mich.
Mar. 8, 1931	HALL, LESLIE LE VANT, Secretary-Treasurer, National Bureau of Casualty & Surety Underwriters, New York.
May 8, 1939	JACKSON, EDWARD T., Statistician, General Accident Fire and Life Assurance Corporation, Philadelphia, Pennsylvania.
Dec. 20, 1920	LUBIN, HARRY, Assistant Actuary, State Industrial Commission, New York.
May. 8, 1937	VOOGT, WALTER G., Treasurer and Director, Associated Indemnity Corporation and Associated Fire and Marine Insurance Company, San Francisco, Cal.
Feb. 23, 1937	WATSON, JAMES J., President and General Manager, Allied Underwriters Corporation, Dallas, Texas.
June 11, 1930	WILKINSON, ALBERT EDWARD, Actuary, Standard Accident Insurance Co., Detroit, Mich.

STUDENTS

This list includes candidates who have passed one or more parts of the Associateship Examinations during the last three years.

Upon the completion of the requirements of the Council in respect to each of these candidates, they will be enrolled as Associates.

The numerals after each name indicate the parts of Associateship Examinations passed.

ACKER, ROBERT D., Ordinary Actuarial Division, Metropolitan Life Insurance Company, One Madison Avenue, New York. (I, II, III.)

ALLEN, EDWARD S., National Bureau of Casualty and Surety Underwriters, 60 John Street, New York. (I, II.)

ANDERSON, PHILIP D., John Hancock Mutual Life Insurance Company, 197 Clarendon Street, Boston, Mass. (I, II, III, IV.)

ARNOLD, KENNETH J., 28 East Raleigh Avenue, West New Brighton, New York. (II.)

ARTHUR, CHARLES R., Manufacturers Life Insurance Company, 100 Bloor Street, E., Toronto, Ontario, Canada. (I, II, III, IV.)

BAILEY, CLARK J., Supervisor, Vermont Highway Planning Survey, Montpelier, Vt. (I.)

BAILEY, ROBERT C., Actuary, Wisconsin Life Insurance Company, Wisc. (I, II, III, IV.)

BAKER, ROBERT W., Manufacturers Life Insurance Company, 100 Bloor Street, E., Toronto, Canada. (I, II, III, IV.)

BARNHART, LYLE H., Illinois Insurance Department, Capitol Bldg., Springfield, Ill. (I, II, IV.)

BART, ROBERT D., (American) Lumbermens Mutual Casualty Company, Mutual Insurance Bldg., Chicago, Ill. (I, II, IV.)

BASH, JOHN K., Student, University of Michigan, Ann Arbor, Mich. (I, II.)

BEVAN, JOHN R., Underwiter, Liberty Mutual Insurance Company, 175 Berkeley St., Boston, Mass. (I, II.)

BILSBORROW, JOHN E., Benefit Association of Railway Employees, 901 Montrose Ave., Chicago, Ill. (I, II.)

BOIG, FLETCHER S., Employers Liability Assurance Corporation, 110 Milk Street, Boston, Mass. (I, II, III.)

BROCK, STANLEY E., Industrial Life Insurance Co., 319 Charest Blvd., Quebec City, Quebec, Canada. (I, II, III, IV.)

BUCKMAN, ALFRED L., Occidental Life Insurance Company, 756 S. Spring Street, Los Angeles, Cal. (I, II, III, IV.)

CAMPBELL, GEORGE C., Metropolitan Life Insurance Company, One Madison Avenue, New York. (I, II, III, IV.)

CANNON, LESLIE A., Assistant Actuary, Great West Life Assurance Company, Winnipeg, Manitoba, Canada. (I, II, III, IV.)

CHAROUS, A. ARTHUR, Old Age Assistance Service of the Cook County Department of Public Welfare, 7300 University Ave., Chicago, Ill. (II, III.)

CHODORCOFF, WILLIAM, Assistant Mathematician, Prudential Insurance Company, Newark, New Jersey. (I, II, III, IV.)

CIVIN, PAUL, Student, University of Buffalo, Buffalo, New York. (I, II, III, IV.)

CLEMENS, JOSEPH L., Student, University of Michigan, 540 Packard Street, Ann Arbor, Mich. (II.)

STUDENTS

CONRAD, FLORENCE, National Bureau of Casualty and Surety Underwriters, 60 John Street, New York. (II, III.)

CROUSE, CHARLES W., Actuary, American Casualty Company, Reading, Pa. (I.)

D'ALESSIO, WAGNER, 2240 Broderick Street, San Francisco, Cal. (II.)

DANIELS, ARTHUR C., Secretary, Institute of Life Insurance, 60 East 42nd Street, New York. (I, II, III, IV.)

DI SALVATORE, PHILIP, Guardian Life Insurance Company, 50 Union Square, New York. (I, II, III, IV.)

DODGE, FRANK F., Massachusetts Protective Association, Worcester, Mass. (I, II.)

DORFMAN, ROBERT, 4319 15th Street, N. W., Washington, D. C. (I, II, IV.)

DUNN, HAROLD C., Casualty Actuarial Department, Travelers Insurance Company, Hartford, Conn. (I.)

EIDE, K. ARNE, Metropolitan Life Insurance Company, One Madison Avenue, New York. (II.)

ENGLAND, ARTHUR W., Office of Coates and Herfurth, Consulting Actuaries, 582 Market Street, San Francisco, Cal. (I, II, III, IV.)

FARRELLY, PATRICK F., 994 St. John's Place, Brooklyn, New York. (I.)

FEAY, MAURICE F., Equitable Life Assurance Society, 393 Seventh Avenue, New York. (I, II, III, IV.)

FELD, JESSE, Social Security Board, Washington, D. C. (I.)

FELDMAN, ISRAEL, Metropolitan Life Insurance Company, Ottawa, Ontario, Canada. (I, II, III, IV.)

FELLERS, WILLIAM W., Prudential Insurance Company of America, Newark, New Jersey. (I, II, III, IV.)

FINKEL, DANIEL, 610 West 139th Street, New York. (I.)

FONDILLER, LEONARD J., Office of Woodward and Fondiller, 90 John Street, New York. (I.)

FOOTE, JEAN VIVIAN, 42 Hochelaga Street, W., Moose Jaw, Sask., Canada. (I, II, III, IV.)

GINGERY, S. W., Prudential Insurance Company of America, Newark, New Jersey. (I, II, III, IV.)

GODDARD, DAVID G., The Travelers Insurance Company, 315 Montgomery St., San Francisco, Cal. (I, II, III, IV.)

GOULD, WIILIAM, Actuarial Division, Metropolitan Life Insurance Company, One Madison Avenue, New York. (I, II, III, IV.)

GOUSS, HAROLD A., 712 So. 16th Street, Newark, N. J. (III.)

GREEN, M. BRENN, New York City Employees' Retirement System, Municipal Bldg., New York. (II.)

GREENE, FOSTER C., National Bureau of Casualty and Surety Underwriters, 60 John Street, New York. (I, II, III.)

GREVILLE, THOMAS N. E., Instructor in Mathematics, University of Michigan, Ann Arbor, Mich. (I, II, III, IV.)

GRODEN, GERALD D., Student, University of Buffalo, Buffalo, N. Y. (I, II.)

HARMATZ, BENJAMIN, 630 Water Street, New York. (I.)

STUDENTS

HENNINGTON, HOWARD H., Equitable Life Assurance Society, 393 Seventh Avenue, New York. (I, III, IV.)

HENRY, MALCOLM H., Statistician, Office of State Budget Director, Lansing, Mich. (II.)

HETHERINGTON, NORRIS W., 2332 College Avenue, Berkeley, Cal. (II.)

HIBBARD, DONALD L., Group Insurance Department, Equitable Life Assurance Society, 393 Seventh Avenue, New York. (I, II, III, IV.)

HOLZINGER, ERNEST, Office of S. H. and Lee J. Wolfe, 116 John Street, New York. (II.)

HOUSEMAN, RAYMOND, 144-25 33rd Avenue, Flushing, New York. (I, II, III.)

JOFFE, SAMUEL W., American Standard Life Insurance Company, Washington, D. C. (I, II, III, IV.)

JONES, CHARLES H., Metropolitan Life Insurance Company, One Madison Avenue, New York. (I, II, III, IV.)

JONES, W. E., Kemper Insurance Organization, 4750 Sheridan Road, Chicago, Ill. (I.)

KALISH, DANIEL H., Compensation Insurance Rating Board, 125 Park Avenue, New York. (II.)

KIRKPATRICK, THOMAS H., London Life Insurance Company, London, Ontario, Canada. (I, II, III, IV.)

KLEINBERG, SAMUEL L., 813 Park Avenue, Brooklyn, New York. (I, II, III, IV.)

KNOWLER, LLOYD A., State University of Iowa, 212 Physics Bldg., Iowa City, Ia. (I, III, IV.)

KWASHA, HERMAN, c/o Marsh & McLennan, 70 Pine Street, New York. (I, II, III, IV.)

LAING, CHARLES B., Prudential Insurance Company, Newark, N. J. (I, II, III, IV.)

LAIRD, W. DARRELL, Actuary, Monarch Life Assurance Company, Winnipeg, Manitoba, Canada. (I, II, III, IV.)

LEARSON, RICHARD J., Associate Actuary, Western & Southern Life Insurance Company, Cincinnati, Ohio. (I, II, III, IV.)

LEHANE, LEO J., Central Life Insurance Company, Chicago, Ill. (I, II, III, IV.)

LENGYEL, BELA A., Department of Mathematics, Rensselaer Polytechnic Institute, Troy, N. Y. (I, II, III.)

LESLIE, WILLIAM, Jr., 18 Kensington Road, Scarsdale, N. Y.

LEVI, LEONARD LEWIS, Asst. Secretary & Actuary, Prudence Life Insurance Company, 407 South Dearborn St., Chicago, Ill. (I, IV.)

LEWIS, BARNETT, 372 St. John Avenue, Winnipeg, Manitoba, Canada. (I, II, III, IV.)

LEWIS, JOHN H., Lumber Mutual Casualty Insurance Company of New York, 41 East 42nd Street, New York. (I, II.)

LINCOLN, CHARLES G., 51 North Quaker Lane, West Hartford, Conn. (I, II, III.)

LITTLE, ROBERT H., EQUITABLE Life Assurance Society, 393 Seventh Avenue, New York. (I, II, III, IV.)

LOADMAN, ARTHUR E., Assistant Secretary, Great West Life Insurance Company, Winnipeg, Manitoba, Canada. (I, II, III, IV.)

LUFKIN, ROBERT W., Employers Liability Assurance Corporation, 110 Milk Street, Boston, Mass. (I, II, III.)

MARKS, MAXWELL, 243 Ryerson Street, Brooklyn, N. Y. (I, II.)

MARSHALL, EDWIN B., American Mutual Liability Insurance Company, 142 Berkeley Street, Boston, Mass. (II.)

MAYNARD, BURTON I., California-Western States Life Insurance Company, Sacramento, Cal. (I, II.)

STUDENTS

MIDDLESWART, FRANCIS F., Equitable Life Assurance Society, 393 Seventh Avenue, New York. (III.)

MILES, JAMES R., Joseph Froggatt & Company, Inc., 74 Trinity Place, New York. (I, II, IV.)

MOORE, HAROLD P. H., Great West Life Assurance Company, Winnipeg, Manitoba, Canada. (I, II, III, IV.)

MORRIS, JOHN C., State Farm Life Insurance Company, Bloomington, Ill. (I.)

MORRIS, WILLIAM S., Equitable Life Assurance Society, 393 Seventh Avenue, New York. (I, IV.)

MULLANS, G. ROBERT, The Travelers Insurance Company, Hartford, Conn. (I, II, III, IV.)

MUNTERICH, GEORGE C., National Council on Compensation Insurance, 45 East 17th Street, New York. (I, II, III.)

MUTH, A. F., Actuary of the Industrial Life Insurance Company, Quebec, Canada. (I, II, III, IV.)

NORBERG, EMIL T., Underwriter, Iowa Farm Mutual Insurance Company, Des Moines, Ia. (I.)

NORDEN, MONROE L., Student, Massachusetts Institute of Technology, Cambridge, Mass. (I.)

NORDOS, WILBUR R., Actuarial Division, Metropolitan Life Insurance Company, One Madison Avenue, New York. (III.)

OGUS, JACK, 180 Beach 41st Street, Far Rockaway, New York. (II.)

O'KEEFE, RICHARD E., Metropolitan Life Insurance Company, One Madison Avenue, New York. (I, II, III, IV.)

ORLOFF, CONRAD, Marsh & McLennan, Inc., 164 W. Jackson Boulevard, Chicago, Ill. (I, II, III, IV.)

PARRY, ARHTUR F., Equitable Life Assurance Society, 393 Seventh Avenue, New York. (I, II, III, IV.)

PAULL, ALLAN E., Student, University of Manitoba, Winnipeg, Manitoba, Canada. (I, II, III, IV.)

PEARLSON, JEANNE S., Student, Massachusetts Institute of Technology, Cambridge, Mass. (II.)

PENNEY, WALTER F., Metropolitan Life Insurance Company, One Madison Avenue, New York. (I, IV.)

PERRY, ROBERT C., Asst. Actuary, State Farm Insurance Companies, Bloomington, Ill. (I.)

POIRIER, ROLLAND, 764 Bloomfield, Outremont, P. Q., Canada. (1.)

PRASOW, ROSE, Actuarial Department, Confederation Life Association, Toronto, Ontario, Canada. (I, II, III, IV.)

PURINGTON, FRANK H., Jr., Metropolitan Life Insurance Company, One Madison Avenue, New York. (III.)

QUIRK, HELEN R., Kemper Insurance Organization, 4750 Sheridan Road, Chicago, Ill. (I.)

RACKOFF, HERBERT C., 356 West 34th Street, New York. (I, II, III, IV.)

RICH, ROBERT F., Standard Accident Insurance Company, 640 Temple Avenue, Detroit, Mich. (II.)

RINTOUL, JOHN W., Canada Life Assurance Company, Toronto, Ontario, Canada. (I, II, III, IV.)

STUDENTS

ROBERTSON, ARTHUR G., Government Insurance Department, Ottawa, Ontario, Canada. (I, II, III, IV.)

ROOD, HENRY F., Lincoln National Life Insurance Company, Fort Wayne, Ind. (I, II, III, IV.)

ROSENBLOOM, IRVING, Actuarial Department, Massachusetts Insurance Department, 100 Nashua Street, Boston, Mass. (I, II, III.)

ROSS, SAMUEL M., National Bureau of Casualty and Surety Underwriters, 60 John Street, New York. (I, II.)

SATTERTHWAITE, FRANKLIN E., Department of Mathematics, State University of Iowa, Iowa City, Iowa. (I, II, III, IV.)

SCHUCK, EDWIN G., National Council on Compensation Insurance, 45 East 17th Street, New York. (I.)

SCHWARTZ, MAX J., New York State Insurance Department, State Office Bldg., Albany, N. Y. (I, II, III.)

SCHWARTZ, RICHARD T., Actuarial Department, New York Life Insurance Co., 51 Madison Avenue, New York. (I, II, III, IV.)

SIEGELTUCH, NORMAN, 4607 York Road, Baltimore, Md. (I, II, III, IV.)

SILLESKY, DARRISON, Life Actuarial Department, The Travelers Insurance Company, Hartford, Conn. (I.)

SILVER, HAROLD J., Office of S. H. and Lee J. Wolfe, 116 John Street, New York. (II, IV.)

STEIN, IRVING, Student, Massachusetts Institute of Technology, Cambridge, Mass. (II.)

STRAND, IVAR E., Social Security Board, Washington, D. C. (I, II.)

STRUBLE, WILLIAM I., The Travelers Insurance Company, Hartford, Conn. (I, II, III).

SUTHERLAND, HENRY M., Sun Life Assurance Company, Montreal, Canada. (I, II, III, IV.)

TEVLIN, DONALD J., Hartford Accident & Indemnity Company, Hartford, Conn. (I, II, IV.)

THOMPSON, EMERSON W., The Travelers Insurance Company, Hartford, Conn. (I, II, III, IV.)

TILLINGHAST, JOHN P., Union Central Life Insurance Company, Cincinnati, Ohio. (I, II, III, IV.)

TOWNE, ROBERT J., Union Central Life Insurance Company, Cincinnati, Ohio. (I, II, III, IV.)

TRACY, ELEANOR, Cornell University, Ithaca, New York. (I, II.)

TUCK, IRA N., 342 Irving Avenue, South Orange, New Jersey. (I, II, III.)

TURNER, PAUL A., Statistician, Eastman, Dillon & Company, 225 So. 15th St., Philadelphia, Pa. (IV.)

TYRRELL MARGERY, Student, Currier Hall, University of Iowa, Iowa City, Ia. (I.)

UHTHOFF, D. R., National Council on Compensation Insurance, 45 East 17th St., New York. (I, II.)

VERGANO, ELIA, Compensation Insurance Rating Board, 125 Park Avenue, New York. (II.)

WALL, DEAN, Actuarial Department, General American Life Insurance Co., St. Louis, Mo. (I, II, III, IV.)

WARD, ROBERT G., Columbian National Life Insurance Co., Boston, Mass. (I, II, III. IV.)

WAREHAM, RALPH E., General Electric Company, Schenectady, N. Y. (I, II.)

STUDENTS

WARTELL, BEN, 2402 65th Street, Brooklyn, New York. (I, II.)

WEINFLASH, BERNARD, State Insurance Fund, 625 Madison Avenue, New York. (I, II.)

WEISS, LILIAN S., State Insurance Fund, 625 Madison Avenue, New York. (II.)

WHITE, AUBREY, 82 Eglinton Ave., East, Toronto, Ontario, Canada. (I, II, III, IV.)

WILLIAMS, JOHN H., Office of George B. Buck, Consulting Actuary, 150 Nassau Street New York. (I, II.)

WILSON, JOHN F., Manufacturers Life Insurance Company, Toronto, Ontario, Canada. (I, II, III, IV.)

WOLFMAN, MAURICE, Office of Harry S. Tressel, 10 South LaSalle Street, Chicago, Ill. (I, II, III, IV.)

YATES, J. ARNOLD, The Travelers Insurance Company, Hartford, Conn. (I, II, III, IV.)

YOUNG, WALTER, Prudential Insurance Company, Newark, New Jersey. (I, II, III, IV.)

ZOCH, RICHMOND T., United States Weather Bureau, Washington, D. C. (I, II, III, IV.)

CONSTITUTION

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

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

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

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

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

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

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

ARTICLE VII.—*Meetings.*

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

ARTICLE VIII.—*Quorum.*

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

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

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

ARTICLE X.—*Amendments.*

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

BY-LAWS

(As Amended November 13, 1936)

Article I.—*Order of Business.*

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

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

Article II.—*Council Meetings.*

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

Article III.—*Duties of Officers.*

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

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

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

The Editor shall, under the general supervision of the Council, have charge of all matters connected with editing and printing the Society's publications. The *Proceedings* shall contain only the proceedings of the meetings, original papers or reviews written by members, discussions on said papers and other matter expressly authorized by the Council.

The Librarian shall, under the general supervision of the Council, have charge of the books, pamphlets, manuscripts and other literary or scientific material collected by the Society.

ARTICLE IV.—*Dues.*

The dues shall be ten dollars for Fellows payable upon entrance and at each annual meeting thereafter, except in the case of Fellows not residing in the United States, Canada, or Mexico, who shall pay five dollars at the time stated. The dues shall be five dollars for Associates payable upon entrance and each annual meeting thereafter until five such payments in all shall have been made; beginning with the sixth annual meeting after the admission of an Associate as such the dues of any Associate heretofore or hereafter admitted shall be the same as those of a Fellow. The payment of dues will be waived in the case of Fellows or Associates who have attained the age of seventy years or who, having been members for a period of at least twenty years, shall have attained the age of sixty-five years.

It shall be the duty of the Secretary-Treasurer to notify by mail any Fellow or Associate whose dues may be six months in arrears, and to accompany such notice by a copy of this article. If such Fellow or Associate shall fail to pay his dues within three months from the date of mailing such notice, his name shall be stricken from the rolls, and he shall thereupon cease to be a Fellow or Associate of the Society. He may, however, be reinstated by vote of the Council, and upon payment of arrears of dues.

ARTICLE V.—*Designation by Initials.*

Fellows of the Society are authorized to append to their names the initials F. C. A. S.; and Associates are authorized to append to their names the initials A. C. A. S.

ARTICLE VI.—*Amendments.*

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

EXAMINATION REQUIREMENTS

SYLLABUS OF EXAMINATIONS

Effective 1941 and thereafter

ASSOCIATESHIP

Part	*Sections*	*Subjects*
I	1	Algebra.
	2	Compound Interest and Annuities Certain.
II	3	Differential and Integral Calculus.
	4	Calculus of Finite Differences.
III	5	Descriptive and Analytical Statistics.
	6	Elements of Accounting, Including Corporate Accounting.
IV	7	Probabilities.
	8	Life Contingencies, Life Annuities and Life Assurances.
V	9	Policy Forms and Underwriting Practice in Casualty Insurance.
	10	Casualty Insurance Rate Making Procedure.

FELLOWSHIP

I	11	Investments of Insurance Companies.
	12	Insurance Law and Legislation.
	13	Insurance Economics.
II	14	Determination of Premium, Loss and Expense Reserves.
	15	Advanced Problems in Casualty Insurance Statistics.
	16	Advanced Problems in Casualty Insurance Accounting.
III	17	Individual Risk Rating.
	18	Social Insurance.
	19	Advanced Problems in the Underwriting and Administration of Casualty Insurance.

RULES REGARDING EXAMINATIONS FOR ADMISSION TO THE SOCIETY

1. **Dates of Examination.**

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

2. **Filing of Application.**

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

3. **Fees.**

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

4. **Associateship and Fellowship Examinations.**

(a) The examination for Associateship consists of five parts and that for Fellowship consists of three parts. A candidate may take any one or more of the five parts of the Associateship Examination. No candidate will be permitted to present himself for any part of the Fellowship Examination unless he has previously passed, or shall concurrently present himself for and submit papers for, all parts of the Associateship Examination and all preceding parts of the Fellowship Examination. Subject to the foregoing requirement, the candidate will be given credit for any part or parts of either examination which he may pass.

(b) A candidate who has passed Associateship Parts I-IV prior to 1941, but who has not been enrolled as an Associate because of lack of the experience qualifications required by the examination rules effective prior to 1941, will be enrolled as an Associate upon passing Part V. Such a candidate may also take Fellowship Examination Parts I-III in the same year as Associateship Part V, subject to the provisions of paragraph (a) above.

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

(d) A candidate who has passed one or more parts of the Associateship or Fellowship Examinations under the Syllabus effective prior to 1941 will receive credit for the corresponding parts of the new Syllabus in accordance with the following table:

Parts Passed Under Old Syllabus (Effective Prior to 1941)	*Parts Credited Under New Syllabus* (Effective in 1941)
Associateship, Part I	Associateship, Part I
" " II	" " III
" " III	" " II
" " IV	" " IV
	" " V
Fellowship, Part I	
" " II	Fellowship, Part I
" Parts III & IV	" Parts II & III

Other combinations of Fellowship parts passed under the old Syllabus will receive special attention by the Educational Committee to determine the credit allowable and the further examinations required to obtain full credit for all Fellowship parts under the new Syllabus.

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

As an alternative to the passing of Parts II and III of the Fellowship Examination, a candidate may elect to present an original thesis on an approved subject relating to casualty or social insurance. Such thesis must show evidence of ability for

original research and the solution of advanced problems in casualty insurance comparable with that required to pass Parts II and III of the Fellowship Examination, and shall not consist solely of data of an historical nature. Candidates electing this alternative should communicate with the Secretary-Treasurer and obtain through him approval by the Examination Committee of the subject of the thesis. In communicating with the Secretary-Treasurer, the candidate should state, in addition to the subject of the thesis, the main divisions of the subject and general method of treatment, the approximate number of words and the approximate proportion to be devoted to data of an historical nature. All theses must be in the hands of the Secretary-Treasurer before the third Wednesday in May of the year in which they are to be considered. Where Part I of the Fellowship Examination is not taken during the same year, no examination fee will be required in connection with the presentation of a thesis. All theses submitted are, if accepted, to be the property of the Society and may, with the approval of the Council, be printed in the *Proceedings*.

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

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

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

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

(c) For the two years preceding date of application, the candidate shall have been in responsible charge of the actuarial or statistical department of a casualty insurance organization or of an important division of such department or shall have occupied an executive position in connection with the phase of casualty work in which he is engaged, or, if engaged in teaching, shall have attained the status of a professor.

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

RECOMMENDATIONS FOR STUDY

To assist students in preparation for the examinations, Recommendations For Study have been prepared. This lists the texts, readings and technical material which must be mastered by the candidates. Textbooks are loaned to registered students by the Society. By "registered students" is meant candidates who have signified their willingness to take the examinations by the payment of their examination fees.

LIBRARY

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

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

1940 EXAMINATIONS OF THE SOCIETY

MAY 15 AND 16, 1940

EXAMINATION COMMITTEE

MARK KORMES - - - GENERAL CHAIRMAN

IN CHARGE OF ASSOCIATESHIP EXAMINATIONS

ARTHUR E. CLEARY, CHAIRMAN
MATTHEW H. McCONNELL, JR.
JOHN A. MILLS

IN CHARGE OF FELLOWSHIP EXAMINATIONS

RUSSELL P. GODDARD, CHAIRMAN
ROBERT V. SINNOTT
HARRY V. WILLIAMS

EXAMINATION FOR ENROLLMENT AS ASSOCIATE

PART I

1. (a) Solve the equations:

$$3x^2 - 2y^2 + 5z^2 = 0$$
$$7x^2 - 3y^2 - 15z^2 = 0$$
$$5x - 4y + 7z = 6$$

(b) Solve the following equation:

$$3x^2 - 7 + 3\sqrt{3x^2 - 16x + 21} = 16x.$$

2. (a) A set out to walk at the rate of 4 miles an hour; after he had been walking 2¾ hours, B set out to overtake him and went 4½ miles the first hour, 4¾ miles the second, 5 the third, and so gaining a quarter of mile every hour. In how many hours would he overtake A?

(b) Prove that the sum of an odd number of terms in arithmetic progression is equal to the middle term multiplied by the number of terms.

(c) If the sum of n terms of an arithmetical progression is $2n + 3n^2$, find the r-th term.

3. (a) Prove by mathematical induction that $(x - y)$ is a factor of $(x^n - y^n)$ if "n" is a positive integer.

(b) Sum $1 + \frac{3}{2} + \frac{5}{4} + \frac{7}{8} + \cdots\cdots$ to infinity.

4. (a) There are three teetotums having respectively 6, 8 and 10 sides. In how many ways can they fall and have at least two aces turned up?

(b) In how many ways can the letters of the word "murmur" be arranged without letting two letters which are alike come together?

5. (a) A loan of $10,000 is to be paid principal and interest at 5 per cent, by yearly payments of $1,000, and one payment of whatever is due after all full payments of $1,000 have been made. This last payment is to be made a year after the last $1,000 has been paid. How many years are necessary to extinguish the debt and what is the last payment?

(b) A man deposits $300. at the end of each year in a bank paying 4% effective. A second man deposits $300. at the end of each year in a bank paying 4% nominal with half-yearly conversion intervals. At the end of 10 years how much more money does the second man have on deposit than the first man?

6. (a) A man leaves a perpetual annuity of annual rent of $1,000. to be equally divided between two hospitals. One is to receive the full annuity until it has received its share, after which the other receives a perpetuity. How long does the first hospital receive the annuity of $1,000. and what is the last payment if money is worth 5% effective?

(b) An insurance policy maturing, the policyholder is given the option of a cash payment of $10,000 or an annuity certain for 10 years. At 3½ per cent, what is the annual rent?

7. (a) A man pays 50 cents at the beginning of each week as a premium on an industrial insurance policy. If money is worth 4 per cent compounded weekly, what would be the accumulated amount of the premiums at the end of the year if the man lives to pay all the 52 premiums?

(b) A city votes a bonus of $500,000 for a drainage system and arranges to pay principal and interest at 6 per cent payable semiannually in 40 equal semiannual payments. What is the semiannual payment?

8. (a) A 3% bond for \$1,000. issued January 1, 1940, with dividends payable semiannually and redeemable at par January 1, 1945, is purchased January 1, 1940 to yield the investor 2% payable semiannually. What is the purchase price?

   (b) Prepare an amortization schedule for the bond in problem 8 (a).

$$a_{\overline{10}|} = 9.4713045 \text{ (at } 1\%)$$
$$a_{\overline{10}|} = 8.31660 \quad (\text{at } 3\tfrac{1}{2}\%)$$
$$a_{\overline{14}|} = 9.89864 \quad (\text{at } 5\%)$$
$$a_{\overline{15}|} = 10.37966 \quad (\text{at } 5\%)$$
$$v^{15} = .48102 \text{ (at } 5\%)$$
$$\frac{i}{j} = 1.01948 \text{ (where } i = 4\%, j = 52)$$
$$s_{\overline{10}|} = 12.0061071 \text{ (at } 4\%)$$
$$\frac{1}{a_{\overline{40}|}} = .04326 \text{ (at } 3\%)$$
$$1.02^{20} = 1.4859474$$

PART II

1. (a) Define class mark and illustrate its use with a frequency distribution (1) where the variates are discrete and (2) where the variates are continuous. What class limits for class width 5% would you consider preferable for a distribution of loss ratios calculated to the nearest tenth of one per cent; e.g., 61.3%?

   (b) What transformation is most useful in developing short methods for the calculation of statistical constants? Illustrate the transformation by a diagram and show how it applies in computing moments about the mean.

2. (a) Compute the coefficient of correlation for the following data:

x	3	4	5	8	9	11	12	15	17	20
y	3	5	7	10	11	14	16	20	23	26

(b) Compute Fisher's "Ideal" index number with 1929 as the base given the following prices and quantities of selected commodities in the U. S.

	1929		*1934*	
Commodity	*Price*	*Quantity*	*Price*	*Quantity*
Tin	450	20	520	14
Lead	68	140	40	62
Zinc	65	130	44	65

3. By the method of least squares find the equation of the parabola fitting the following data:

x	0	5	10	15	20	25
y	10	5	10	20	35	50

4. When may a normal curve be reasonably fitted to a frequency distribution and what assumptions must be made? Outline in detail the steps to be followed in making such a graduation, giving the column headings for the calculation.

5. The "X" Wholesale Jewelry Company is fully covered against loss by an insurance company. On August 1, the store is burglarized and all but $10,000 in goods is taken; the owner files a claim for $5,000. From his books you learn that he started the year with goods on hand worth $13,495.86; purchases during the first seven months totalled $54,835.64; accounts receivable on December 31st were $11,212.40 and on July 31st were $12,435.22; cash received from customers during the seven months amounted to $145,870.43 after allowing discounts of $2,906.75. Prepare a statement of your evaluation of the loss if the records show an average gross profit from sales of 180% during the past five years. How excessive was the claim?

6. Following are the balances of the general ledger of the A.B.C. Company as of December 31, 1939. Prepare a trial balance. You may abbreviate the accounts in order to conserve time.

Advertising	$ 25,000
Accounts Receivable	250,000
Accounts Payable	50,000
Bonded Indebtedness	240,000
Building	265,000
Bad Debts Written Off	10,000
Capital Stock	350,000
Delivery Expenses	7,000
Discounts on Sales	11,000
Discounts on Purchases	9,000
Finished Goods Inventory 12/31/38	35,000
Cash	85,000
General Expenses	15,000
Goods in Process 12/31/38	10,000
Heat, Light and Power	20,000
Interest on Bonded Debt	12,000
Insurance and Taxes	16,000
Machinery and Equipment	215,000
Purchases	600,000
Rent	4,000
Reserve for depreciation	40,000
Surplus	111,000
Sales	1,200,000
Salaries and Wages	420,000

7. Make adjustments for the following in the case of the A.B.C. Company:

Reserve for Doubtful Accounts	$ 1,000
Accrued Payroll	19,000
Depreciation	20,000
Inventory December 31, 1939:	
(a) Finished Goods	52,000
(b) Goods in Process	15,000

8. Prepare a profit and loss statement and a balance sheet for the A.B.C. Company.

PART III

1. (a) Express $2x^{(3)} + 7x^{(2)} + 2x^{(1)} - 10$ as a polynomial in x using the method of detached coefficients.

   (b) By means of a central difference formula obtain the value of $f(41)$ given:

$$f(30) = 3{,}678.2$$
$$f(35) = 2{,}995.1$$
$$f(40) = 2{,}400.1$$
$$f(45) = 1{,}876.2$$
$$f(50) = 1{,}416.3$$

2. Evaluate $\sum_{1}^{n} \frac{x^2 4^x}{(x+1)(x+2)}$

3. (a) Prove that a divided difference of the p^{th} order is a symmetric function of its arguments.

   (b) Prove that if u_x be a rational integral function of x of the n^{th} degree, and if values u_a, u_b, u_c, $\cdots\cdots$ of u_x be given, then the expression for u_x in terms of its divided differences is the same whatever the order of arrangement of the u's.

4. If $w_n = [5]\, u_n$, prove King's formula $u_0 = .2\, w_0 - .008\, \Delta^2{}_5\, w_{-5}$ neglecting fourth and higher differences. The subscript 5 indicates that the difference is taken over an interval of 5.

5. (a) Prove $\frac{du}{dz} = \frac{\delta u}{\delta x}\frac{dx}{dz} + \frac{\delta u}{\delta y}\frac{dy}{dz}$
   where u is a function of x and y which are functions of z.

   (b) Using the above formula find $\frac{dy}{dx}$ given that $x^{1/3} + y^{1/3} = a^{1/3}$.

6. Find the first three terms in the expansion of

$$\log\left(\sqrt{1+x} + \sqrt{1-x}\right)$$

   in powers of x.

7. Evaluate $\int \frac{x^3}{(x+1)(x^2+1)}dx$ and $\int (x+a)\log(x+b)\,dx$.

8. Discuss approximate integration. Write down the important formulæ noting their distinctive features.

PART IV

1. (a) A plays a game with B in which each has the same chance of winning. They repeatedly stake a dollar against a dollar. If A has m dollars and B has n dollars, what is A's chance of winning all $m + n$ dollars?

   (b) A and B are two inaccurate arithmeticians whose chance of solving a given problem correctly are $\frac{1}{8}$ and $\frac{1}{12}$ respectively; if they obtain the same result and if it is 1000 to 1 against their making the same mistake, find the chance that the result is correct.

2. A bag contains a coin of value M, and a number of other coins whose aggregate value is m. A person draws one coin at a time till he draws the coin M. Find the value of his expectation.

3. A, B and C play a game in which each has a separate score, and the game is won by the player who first scores 3. If the chances are respectively $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{4}$, that any point is scored by A, B, C, find the respective chances of each player winning the game.

4. A die is thrown until every face has turned up at least once. Show that on an average $14\frac{7}{10}$ throws will be required.

5. (a) Show that $p_x = \dfrac{(1+i)\,a_x}{a_{x+1}}$

   (b) Interpret in words the symbols ${}_nE_x|_{yz}$, ${}_nE_x|_{\overline{yz}}$ and ${}_nE|_{\overline{xyz}}$.

6. (a) Determine the net single premium and the net annual premium for an endowment insurance of \$1,000 to a person age 28, the term being 20 years, interest rate $3\frac{1}{2}\%$.

Given:	x	D_x	N_x	M_x
	28	33157.4	661733.2	10779.94
	48	13738.5	208509.8	6687.466

(b) According to the American Experience Table a man age 40 has a life expectancy of 28.18 years. Using the same table at 3½% interest we find that $16.45 is necessary to pay $1.00 a year to a man of 40. If this money were invested at 3½% interest would it just provide $1.00 a year for the 28.18 years?

7. State the Makeham law of mortality. How is a Makehamized table of mortality formed?

8. Describe the various methods of valuation of life insurance policies.

EXAMINATION FOR ADMISSION AS FELLOW

PART I

1. (a) Give and explain four elements of coverage provided under the Residence Policy Section of the Burglary Manual.
   (b) Give three of the four different ways in which the Residence Coverage can be written.

2. (a) Assume an insurer has issued Compensation and Public Liability insurance to an Ice Cream manufacturing risk, and upon audit the following payrolls were developed:

Plant Operations	$100,000
Drivers	20,000
Helpers	10,000

   The compensation rate for Ice Cream Manufacturing including D. C. & H. is $3.00. The Public Liability rate for Ice Cream Manufacturing is $1.00. Calculate the earned premium for the two coverages.
   (b) Assume that one of the truck drivers employed by the above risk, while delivering a large can of ice cream to a retail store, injures one of the customers in the store. Would this accident be covered under the Public Liability policy mentioned above, or under an Automobile Liability policy? Give reasons for your answer.

3. If your company were providing liability coverage for the tenant of a building under an Owners' Landlords' and Tenants' policy, in what two ways could you provide coverage for the owner and what are the advantages of each?

4. (a) Private Passenger automobile risks in most states are classified as A1, A, B, and C. What types of risk are included in each of these classes, and how do the rates differ from class to class?

   (b) Describe the Medical Payments coverage now available in connection with automobile private passenger policies. For whose benefit are these payments made, what are the limits of coverage, and what rates are used?

5. (a) In what respects does a contract of suretyship differ from a contract of insurance?

   (b) What is a (1) bid bond
   (2) faithful performance bond
   (3) labor and material bond

6. A casualty insurance company licensed in New York has capital of $2,000,000 and surplus of $1,500,000. It owns $750,000 of insurance company stock.

   (a) How much additional insurance stock may it purchase under the New York law?

   (b) How much insurance stock may it accept as a stock dividend?

7. At the end of 1938 the distribution of admitted assets of a representative group of stock and mutual casualty companies was as follows:

	Stock Companies	*Mutual Companies*
Bonds — Government	29.3%	34.6%
State and Municipal	6.7	8.0
Other Bonds	16.2	20.8
Total Bonds	52.2%	63.4%
Total Stocks	20.0%	5.8%
Cash	11.2	17.1
Uncollected Premiums	9.6	5.9
Real Estate and Miscellaneous	7.0	7.8
Grand Total	100.0%	100.0%

(a) Give reasons for the differences in distribution of assets between the two types of carriers.

(b) What differences would be noted between the figures above and a similar tabulation as of the end of 1930 or 1931?

8. Fire and casualty companies still hold substantial amounts of railroad securities. In view of the fact that the record indicates the railroad industry to be a decadent one, can this policy be justified? Explain.

PART II

1. (a) What factors generally determine the state in which a contract of insurance is made?

   (b) Under what principle of law would that contract be enforced in another state?

2. (a) Do Workmen's Compensation laws, which provide for payment of indemnity regardless of fault, violate the "due process" clause of the United States constitution or similar clauses in state constitutions? Explain.

   (b) What are the three classic defenses against employers' liability claims? Describe the part which they play in elective compensation laws.

3. It has been stated that the real effect of the Paul v. Virginia decision was not that "insurance is not commerce" as it is usually quoted. Comment on this statement, and give the actual points at issue in this case.

4. (a) Explain the purpose and method of operation of the Aggregate Trust Fund as established by the New York Compensation Law.

   (b) Explain the purpose and method of operation of the Security Funds required in New York.

   (c) What are the benefits provided for in the New York Compensation Law for partial or total disability or death due to silicosis after June 6, 1936?

5. (a) What effect has the Uniform Sales Act on Products Liability Coverage?

   (b) Assume that a stevedore is injured while on the gangplank of a ship. State the usual rule followed by the courts to determine whether the accident comes under State or Federal jurisdiction.

6. What is the purpose of automobile guest laws as generally enacted? State which of the following classes of people are guests:
   (a) Relatives or friends who share expenses.
   (b) Employees of the owner.
   (c) Potential customers.
   (d) Fellow-employees of the same employer.

7. (a) Discuss briefly the differences between self-insurance and non-insurance, pointing out under what conditions each of these devices is a satisfactory form of risk-bearing.

   (b) Describe various devices in common use in the business world to eliminate or transfer risk.

8. Explain the method of operation of hospitalization plans as now offered by non-profit organizations and private insurance companies. What important form of coverage is not provided by these plans and how may this need be met?

PART III

1. (a) State what percent of the manual premium for Workmen's Compensation insurance is allotted for each of the following expenses: acquisition, claim adjustment, inspection and bureau, payroll audit, administration and taxes.

   (b) In what way does the contingency loading in compensation rates differ from a profit loading?

2. (a) In workmen's compensation manual rate-making, what disposition is made of catastrophe losses, losses under common law or admiralty law, recoveries from third parties, and losses partially or wholly covered by reinsurance?

(b) Calculate the Loss Conversion Factor, for use in the Retrospective Rating Plan, for a state with the standard expense loading.

3. (a) Explain the derivation and application of the credibility criteria for determining workmen's compensation formula pure premiums. What are the advantages and disadvantages of this method of measuring credibility, and what other methods might be adopted?

(b) What experience period is used in calculating workmen's compensation rate levels for an entire state, and for the industry groups within the state? State the criteria for full credibility in each case, and outline the procedures used if the experience is too small to warrant full credibility.

4. Complaint is made that the application of the Public Liability Experience Rating Plan is producing debits on O. L. and T. coverage for Department Stores although the loss ratios have been favorable. What feature of the Plan is causing this?

5. (a) Justify the use of average values for Death and Permanent Total disability cases in the compensation Experience Rating Plan.

(b) May an experience rating modification be revised if one of the losses used in the rating was reported incorrectly? What revision, if any, may be made if a recovery is made from a third party after the full amount of the original loss has been used in a rating?

6. (a) Discuss the elements which must be given consideration in Surety rate-making.

(b) Outline the factors militating against the adoption of a merit rating plan for contract bonds.

7. Describe briefly the excess limits tables now in use in automobile liability insurance. What methods would you employ for testing the adequacy of these tables?

8. What types of internal statistics would you use in order to maintain a favorable loss ratio in automobile liability insurance?

PART IV

1. The following figures are taken from the 1938 and 1939 statements of a casualty company.

1938 Statement

Ledger Assets December 31, 1938	35,000,000
Interest Due and Accrued	250,000
Book Value of stocks and bonds over market or amortized value	500,000
Other Non-Admitted Assets	350,000
Total Admitted Assets	34,400,000

1939 Statement

Written Premiums	24,000,000
Interest and Rents Received	920,000
Profit on Sale of stocks and bonds	105,000
Accrual of discount	10,000
Total Income	25,035,000
Losses Paid	10,350,000
Underwriting Expenses Paid	8,800,000
Investment Expenses Paid	200,000
Dividends Paid	400,000
Loss on sale of stocks and bonds	400,000
Amortization of Premiums	210,000
	20,360,000
Ledger Assets December 31, 1939	not given
Interest Due and Accrued	310,000
Book Value of stocks and bonds over market or amortized value	300,000
Other Non-Admitted Assets	350,000
Total Admitted Assets	not given

(a) Calculate the ledger assets as of December 31, 1939, using the above information.

(b) Calculate the "Gross Interest and Rents Earned" and the "Gain from investments during the year" following the form used in the annual statement blank.

2. (a) What provision for reporting the expenses of adjustment of Liability and Workmen's Compensation losses is made in the Disbursements and Liabilities pages of the annual statement? In what respects do these figures agree with the amounts shown in Schedule P?

   (b) What instructions would you give to the Claim Department of an insurance company in order to insure a proper segregation of medical losses between those incurred under the regular provisions of the Standard Automobile Liability policy and those incurred under the Medical Payments endorsement?

3. Describe the form used by the National Council on Compensation Insurance for Loss Ratio Calls. In what respects do the premiums and losses reported in these forms differ from those reported in:

   (a) Schedule Z
   (b) Schedule W
   (c) Unit Statistical Plan

4. As actuary of a multiple line casualty company with branches throughout the country, you are called upon to determine whether the cost of the various branch offices is being kept within reasonable limits. Indicate the elements which you would consider in your treatment of this problem.

5. Outline a plan of compulsory automobile insurance which would avoid or minimize the undesirable features generally considered inherent in compulsory insurance. Make particular reference to:

   (a) Type of coverage afforded
   (b) Rate supervision
   (c) Treatment of Undesirable Risks

6. (a) Distinguish between facultative, open treaty and fixed treaty reinsurance. What other methods of reinsurance are used by casualty companies?

(b) Describe briefly the regulations affecting reinsurance companies with particular reference to taxation and preparation of annual statements.

7. Design a punch card to furnish experience on individual compensation risks. Indicate the sources of information available for such a card, and the uses to which it might be put.

8. (a) What devices may be used by a company which accepts business from independent brokers to insure a reasonably favorable loss ratio on the business so accepted?

(b) The supervising authority of a certain state has ordered that the manual rates for coverage under the U. S. Longshoremen's and Harbor Workers' Act be shown separately from the rates for coverage under the state act. Outline a practical method for meeting this requirement, and explain how you would calculate the necessary rates.

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