# ABSTRACT OF THE DISCUSSION OF PAPERS READ AT THE PREVIOUS MEETING

## A REALISTIC PLAN FOR DETERMINING COMPENSATION RATE LEVELS—LEON S. SENIOR, VOL. XX, PAGE 27

### WRITTEN DISCUSSION

MR. A. H. MOWBRAY:

This paper and that on "Rate Levels for Workmen's Compensation Premiums" by Mr. Perryman (page 45), contradictory and antagonistic as they are in certain respects, are in agreement in advancing a new and fundamentally different concept of the workmen's compensation rate. It does not seem to the writer that as Mr. Senior says, it is merely a more realistic approach to the same problem. It is rather an approach to a different problem of which the solution may be easier and more readily explained. But the theoretical justification of this shift in the problem and its solution implies an even more important shift in the concept of the place and function of the insurance carrier. Furthermore the adoption of this concept would seem to call for radical changes in the present manner of conducting the compensation insurance business along lines suggested by Mr. Greene in his paper (Vol. XIX, p. 230) but going much further.

As Mr. Senior puts it "Until the present time we have proceeded on the theory that the rate level for the coming year must reflect the true conditions of that year". This seems to be a correct statement. What concept of the rate lies back of such a theory? If the writer mistake not, it is that the rate is a fixed price for a contract for future delivery, in no fundamental respect different from the price for cotton or wheat to be delivered in the future. This is a fundamental concept of proprietary operation (non-participating operation) of enterprise whether in the field of insurance or otherwise. The proprietor assumes the risk of loss through a misestimate in consideration of a prospective profit. That has been and is the attitude of most stock insurance carriers in all fields and the fixed price has been the chief selling argument.

It is true that the mutual carriers have been equally insistent on this theory of rate making though their concept of the rate has not been that of a fixed price. The explanation of their attitude is to be found in the competitive situation. They cannot reap the full benefit of their competitive advantage unless the rate for the stock company is adequate for its manner of doing business.

There has been, it is true, some recognition of the principle that insurance should operate to spread risk over time as well as over individuals, and for precise accuracy year by year there may be substituted average accuracy over a period of time. This has not been felt to be an essential modification of the theory or the concept underlying it.

The concept of the rate underlying the new proposals seems to be quite different. The price, though fixed as to the individual contract, is, as to the insuring public, not a fixed price but only a tentative one to be adjusted in the rates for future contracts in the same field so that the carrier will not take the risk of misestimate but will perform the service of risk distribution on a "cost plus" basis. It acts, not as a private proprietor conducting its own business for profit but as an agent of the group for whom it is operating or perhaps the state with a guaranteed compensation for service. This is essentially the rôle of the participating carrier whether organized as a stock or mutual corporation, inter-insurance exchange or a state fund. The manner of adjusting the charges to cost, whether by dividends or assessments in respect to the past year or by modification of the rate for the ensuing year, is not a matter of principle but a detail, however important it may be to the individual insured.

It may well be that this is a truer conception of the rôle of a compensation insurance carrier. Are the stock companies prepared to accept this rôle? What changes, if any, in their manner of conducting the business are implied in this new concept of their function? The answer to this latter question will probably determine the answer to the former. Before attempting to answer it it may be well to consider the position of the state in relation to compensation insurance, not only in respect to supervision of rates but to the entire theory and conduct of the business. This latter has not received much attention in our discussions, but is, in the writer's opinion, the key to the problem.

Various theories have been advanced to explain the provisions in our state laws for supervision of workmen's compensation insurance rate. The provision requiring reasonableness seems to arise from a fear that the carriers in combination may attempt the monopoly practice of exacting all the traffic will bear. That seems to have been the basis of court's reasoning in the case of German Alliance *v.* Lewis, approving the Kansas law relative to fire insurance rates. But it cannot underlie a requirement that rates be adequate, the most common requirement for compensation rates. The usual explanation for this type of law is that it is necessary to assure the solvency of the carriers in order to protect the prospective claimants, and it is added that the nature of the compensation laws and the generally weak economic position of this class who do not choose the carrier makes it a peculiar responsibility of the state to protect it. (In passing, it may be noted that the states have not consistently followed this theory even when the law requires that compensation rates be adequate, in that they have permitted the carriers writing workmen's compensation insurance also to engage in other lines on which they may, and recently have, incurred heavy losses. Yet they have regarded the companies as units whose entire assets were on call for any claim and have not required segregation of the assets and liabilities representing the compensation business). It seems to the writer that this theory implies something of deeper significance to which most of us prefer to close our eyes.

Whether we like it or not, or are or are not willing to recognize it as such, workmen's compensation is a phase of social insurance, meaning by that term the attempt of the state to solve problems of social welfare by compulsory application of the insurance principle.

If this view is taken then the rôle of the insurance carrier stock, mutual or other, is that of an agent of the state in carrying out its social policy, and it is the state's duty to see that its agent is in all respects competent to perform its agency. The proposal that the state approve a scheme of rate-making based on the theory of adjusting the rate level to make up past losses and refund profits is quite consonant with this rôle of the carrier. Indeed it seems to the writer more so than the theory of a fixed rate with the carrier taking the profit or loss. But there are many other practices of the present day which do not seem in accord with that rôle or the underlying concepts of the new proposals.

Can the state justify guaranteeing, through the right of future adjustment of rates to make up past losses, the adequacy of the income arising from that income to be exposed to other risks? Rather, is not segregation of the compensation business a necessary corollary? At what point can the state fix the guaranteed loss ratio? Can it in effect guarantee the compensation of agents or brokers through the expense provision it allows without critical inquiry as to the value *for the state social policy* of their activities? How far should the state foster competition between its several agents performing the same service? Perhaps other questions along the same line might be formulated. The writer believes the above are sufficient to indicate what seem to him the implications of the new proposals which the carriers must carefully study before seriously advancing them as a solution for their present difficulties.

Turning from these broader philosophic aspects of the paper to the more immediate and presently practical, Mr. Senior's proposal appeals to the common sense of the average business man as a reasonable plan to reach the desired end. This is particularly true if costs are thought of as fluctuating in a cyclic manner. Mr. Perryman's investigation has shown that if costs are increasing in an arithmetic trend it will not over the long run produce an adequate total volume of premiums and conversely that if they are decreasing in an arithmetic trend it will produce a redundant volume. If the increase or decrease is at a more rapid rate the discrepancy will be greater.

Of course, an indefinite increase even in an arithmetic trend would ultimately reach an infinite figure and is practically unthinkable. We must then suppose that a limit is ultimately reached. When the limit is reached the plan will produce right rates subject to adjustment for cyclic fluctuations. It should be noted that Mr. Senior does not propose the plan as producing satisfactory rates for all but rates "adequate in the long run for the business as a whole and *for companies sufficiently stable to* *withstand the shock of exceptional losses in a given year*" (italics mine). I think he would permit the extension "for companies sufficiently stable to provide for a gradual approach to the ultimate goal".

Mr. Senior's plan produces rates which change gradually from year to year. As was pointed out by Mr. Greene (Vol. XX, p. 167), Mr. Perryman's annual adjustment plan brings out "tremendously unstable rate levels". This is due to the fact that it aims to adjust *annual* rate levels making them follow closely whatever cyclic variation there may be in the experience. This, Mr. Senior's plan aims to avoid. Perhaps less satisfactory to the companies as proprietary enterprises because of lack of faith in the achievement of the ultimate goal, the plan providing for more stable rates will probably cause less controversy with the rate payers. Violent fluctuations tend to breed lack of confidence in the judgment of those charged with rate-making.

The proposal to use calendar year rather than policy-year data does not seem an important change provided the estimate of calendar year incurred losses includes true adjustment in estimates of outstanding losses. The policy-year is a more artificial creature of accounting and statistical technique than the calendar year. When the purpose was to establish probabilities or frequencies of occurrence on which to base estimates it was important to be able to allocate losses accurately to the exposures from which they arose. To this end policy-year accounting was essential. Rate level determination is a different sort of problem to which that basis of accounting seems ill-adapted.

There remains the question whether the plan, if acceptable to state authorities, will produce rates which will yield the desired standard loss ratios. Here I share the misgivings voiced by Mr. Greene at the last meeting. (Vol. XX, pp. 167-8). It seems to the writer that so long as a loss ratio is fixed at so low a figure as 60% or thereabout the selection must be against the companies. As rates rise, from whatever cause, the drift of the better business will be toward self-insurance, or participating carriers. The prime requirement of the stock companies, if they wish to continue as compensation carriers, seems to be to increase their efficiency as such so that the state will have nothing to apologize for in constituting them its agents for carrying out a phase of its social policy.

## AUTHOR'S REVIEW OF DISCUSSION

### MR. LEON S. SENIOR:

Mr. Mowbray's discussion of my paper brings out in clear relief the distinction between the orthodox concept of rate making and the new philosophy which underlies the proposal advocated in my paper as well as in the treatise presented by Mr. Perryman.

In the past we did make the mistake of assuming "that the rate is a fixed price for a contract for future delivery, in no fundamental respect different from the price for cotton or wheat to be delivered in the future". It is time to realize that workmen's compensation, as a branch of social insurance, must be treated radically different, insofar as price is concerned, from the ordinary commodity. It may be true that the adoption of the new concept will require radical changes in the present manner of conducting the compensation insurance business, but why fear the consequences? However, I do not feel that in providing a sound basis for determining rate levels we are necessarily inviting a revolution in underwriting, although certain reforms may follow as a matter of course.

Mr. Mowbray develops the argument that the adjustment of the rate level from year to year under an account current principle places the company in the rôle of a participating carrier, whether or not it is organized as a stock or mutual corporation. I am inclined to believe that this argument is rather far-fetched. Yearly adjustment in rate levels for an entire group, comprising sixty companies, is entirely different from an adjustment made by a single participating carrier, where dividends are declared to policyholders from earned surplus, derived from investments, from underwriting profits and administrative economies.

On the assumption that the concept underlying my plan places every stock company in the participating class, Mr. Mowbray asks: "Are the stock companies prepared to accept this rôle"? I confess I did not give much thought to the question whether stock companies as a group are prepared to accept a rôle which may bring them into the participating class. In the first place, I do not look upon the proposed formula for rate levels as having the effect of changing stock companies into participating carriers. Nor would I be much concerned if it did have that purely nominal effect. In the second place, I find the stock companies quite receptive to the new idea and there is a good reason for it. After having suffered substantial losses in the past decade, they should be willing to accept a proper remedy even if it may bear the "participating label".

The probability that an improved rate level would force the stock companies to adopt a participating plan is rather remote. Participation would call for exceptional economies on the part of a company which is serving small risks on the agency plan or whose clientele lies largely in the contracting group. Adverse selection, because of higher net cost, is an influence not to be underestimated, but the fact remains that the purchaser of insurance, in making his choice of the insurance carrier, does not limit himself to the question of cost. Other elements, some of them of an intangible character, enter into his calculations and affect his final decision. This is demonstrated by the fact that after twenty years' experience in compensation, notwithstanding numerous changes in the rate level, some of which were rather drastic, the stock carriers are still retaining 69% of the total volume for the country at large, and 58% for the State of New York.

The formula which I presented in my paper has since been subjected to the clash of debate and the fire of discussion. In this process the formula was greatly modified, but the underlying idea was retained. Only within the last few days the New York Insurance Department has approved a new formula for rate levels which retains the account current idea based upon the accumulation of calendar year experience. The formula has the complete support of the several groups of insurance carriers and it is my understanding that the stock companies as a group welcome this change as a real advance in workmen's compensation rate making.

In dissecting the theory underlying supervision of rates by the state, Mr. Mowbray reaches the conclusion that the insurance carrier, whether stock or mutual, may be regarded as an agent of the state in carrying out its social policy. With this most of us will probably agree. Since the state has constituted the insurance carrier as its agent, it is logical for it to control competition by providing a sound basis for rates and reserves in order to make certain the fulfillment of the obligation imposed upon the employer. In its rôle as principal the state may also find it necessary to regulate commissions to producers and to introduce such other checks as may be necessary to maintain the solvency of the agent.

It is gratifying to find that my proposal to use calendar year in place of policy year data meets with Mr. Mowbray's approval. This feature has been the principal bone of contention in our discussions, and it was only after long debate that the dissenters agreed to accept calendar year experience for determining profit and loss under the account current principle.

In changing from the old system to the new there is the prospect that an annual adjustment in the rate level under a definite plan, giving due recognition to the profit and loss account, will provide an adequate rate level over a period of years, enable the rating organization to make rapid corrections, bring into the picture all latest developments both as to additional premiums and reopened cases, remove all elements of guesswork and prophecy, eliminate controversies among the carriers and supervising officials and finally create a feeling of stability and confidence in dealing with the general public.

Mr. Mowbray's essay constitutes a brilliant contribution to the discussion on the subject of rate levels. It is written in a masterly way by one who has thoroughly analyzed the theoretical as well as the practical features of the problem. I think we may all be congratulated on the fact that the debate on the subject has not proven inconclusive. It is the fate of the ordinary paper and its accompanying discussions to be buried in the archives of the Society. The author and his friendly critics in this case have the consolation of knowing that their ideas have advanced beyond the academic stage to find a place in real life.

## CORRECTION OF CERTAIN DEFICIENCIES IN THE EXPERIENCE RATING PLAN BY THE SO-CALLED "ACCOUNT CURRENT" METHOD—MARK KORMES, VOL. XX, PAGE 68

### WRITTEN DISCUSSION

MR. J. M. CAHILL:

Mr. Senior and Mr. Kormes of the Compensation Insurance Rating Board are to be congratulated on the pioneering work they are doing in connection with rate-making and rating plans. Mr. Senior has proposed that calendar year experience be used in determining compensation rate levels. Following a somewhat similar line of reasoning, Mr. Kormes has recommended that recognition be given in the experience rating calculation to the effect of the development of the loss data used in previous ratings during the interval between the two latest reportings of the experience. Out of such investigations and studies as they have been making, constructive changes may ultimately result.

Although the "account current" method of experience rating, as advocated by Mr. Kormes, may have certain theoretical advantages over the present method, it is the writer's opinion that the practical disadvantages of such a method outweigh the theoretical advantages. The purpose of experience rating is to establish proper rates for individual risks prospectively. The "account current" method proposes to combine with such prospective rate determination, a retrospective revaluation of the losses employed in the experience rating calculation. The introduction of this adjustment would radically change the theory of experience rating which has been accepted in the past. Experience rating has logically been considered to be an instrument for measuring prospectively the loss hazard of a risk, and it does not appear practicable to destroy this theory by including a retrospective revaluation of losses in the rating calculation. The Experience Rating Plan cannot be made perfect for all risks and it would be far from desirable to change the established theory underlying experience rating in order to benefit only a few risks.

It must be recognized that the Experience Rating Plan is only approximate at best. The fact that claim adjusters sometimes err in their estimates of incurred loss on open cases is no more serious than the theoretical injustices produced by further lack of refinement in both rate making and experience rating. For instance: (1) no recognition is given to the possible variation in the average cost of Death and Permanent Total cases by industry group, (2) until the recent past, separate rate levels by industry group have not been established, (3) in general, it may be said that there is failure to establish proper experience rating off-balance correction factors by industry group, and (4) it is debatable whether correct loss and expense provisions are determined for the various sizes of risk.

Taking into account the present attitude of most insurance companies toward the compensation line, one is inclined to discount Mr. Kormes' remarks about the serious proportions which competitive abuses are assuming. Workmen's compensation coverage is not looked upon with the favor that it was in 1928 and 1929, and most companies are reluctant to write such coverage unless they receive the collateral lines of insurance on the same risks. Unquestionably, the companies still wish to deal fairly with the assureds by requesting legitimate changes in ratings, but it does not appear likely that the companies would deliberately underestimate reserves in order to produce a favorable effect on the modification of a particular risk. Since the compensation rate level is generally recognized as being inadequate, it would indeed be a short-sighted policy to underestimate the losses on rated risks, thereby also affecting the general rate level for the state.

Anyone familiar with workmen's compensation insurance will admit that one of the greatest needs of the business today is simplification rather than the introduction of more complications. This is particularly true of experience rating. A considerable step forward along the line of simplification was taken when schedule rating was discontinued in many states a short time ago. It is exceedingly difficult to explain the mechanics of the present experience rating blank to agents and assureds. The addition of two or more sections to the present blank would make such explanation even more complicated.

Mr. Kormes has estimated that the increase in expense in the New York Board due to the introduction of the "account current" method would be only nominal. It is found from experience that the actual increase in expense when such a change is made greatly exceeds the anticipated increase. It is the writer's belief that the actual increase in expense due to the introduction of the Unit Statistical Plan exceeded by far the estimates of the individual companies and of the New York Board.

Without doubt the insurance companies could expect an increased volume of inquiries from the field with regard to experience rating calculations if this plan were introduced. It would be necessary to instruct the company organization and also both the agents and assureds concerning the mechanics of the proposed modification. Instead of increasing the cost of handling compensation business, the urgent need in both the insurance companies and the rating boards is to reduce the expense of operation.

The present expense ratio of most companies is much too high and this statement likewise holds true of the Boards and Bureaus.

Mr. Kormes has recognized that it is impossible to reflect the effect of payroll trends in his adjustment for the development of losses. The payroll trends in recent years have been very sharp and this would tend, of course, to destroy the theoretical balance of the "account current" method. As a result, the realized effect of the account current adjustment might differ very considerably from the anticipated effect on the premium volume.

It should also be pointed out that there is a considerable shifting of business from one insurance company to another. The introduction of the "account current" method would produce serious injustices to some companies in the case of individual risks which were previously written in other companies; and likewise, certain insurance companies would benefit from the "account current" adjustment of some risks previously written in other companies. This raises the question as to whether or not it would be necessary to make provision for a premium adjustment among the insurance companies in recognition of the effect of the "account current" adjustment.

Unquestionably, the introduction of the "account current" method would tend to increase the fluctuation in the modifications of individual risks from year to year. It would appear that the final adjusted rates of individual risks would be less stable than they are under the present plan. This would probably be a disadvantage on the average to those risks which receive a considerable portion of their work on the basis of competitive bids.

One must admit that at first glance there is a distinct attraction to the thought of ultimately adjusting the losses used in the rating calculation to the equivalent of a fourth reporting basis. It appears, however, that this advantage is more than offset by the practical disadvantages of the plan. If the "account current" principle were introduced, it would be a case of making a major change in the theory of experience rating in order to correct one of the minor problems of the business. Among the many practical disadvantages to the proposed plan, the following are of real importance: the impossibility of reflecting the effect of payroll trends; the fluctuation in the modifications of risks from year to year; the injustices to individual insurance companies due to the normal transferring of business from one company to another;

and the real possibility of an increase in the operating expense of both the insurance companies and the rating boards at a time when one of the important needs of the business is for a reduction of the expense ratio.

## AUTHOR'S REVIEW OF THE DISCUSSION

### MR. MARK KORMES:

Mr. Cahill in his discussion of my paper criticizes the proposed method, first because it presents a major change in the theory of the Rating Plan and, second, because of practical difficulties which might be caused by its adoption.

Let us examine first the assertion that the proposed method introduces a major change in the theory of experience rating by destroying the prospective measurement of loss hazard and introducing a retrospective element. The theory of prospective rating is based on the assumption of the existence of variation in hazard of the individual risk from the class average and that the degree of such variation is measured by a comparison of the risk experience with the experience of the class average. In order that such comparison be proper it is essential that both the risk experience and the class experience be on a similar basis. In the determination of the rates for the class a very complicated procedure is used not only to assure the proper class relativity but also to provide for the inclusion of all losses at their *ultimate* values, and to adjust the experience to the latest level. In the Experience Rating Plan, however, such adjustment to an ultimate basis is only partly recognized in that the payroll modification factors are calculated to discount the average cost at new rates to the level of the experience period.

From this point of view the account current method of experience rating does not in any way destroy the theory of prospective ratings but it merely corrects (over a period of time) for the difficulties due to the human element of judgment. Time and again we have been forced to amend our rules in the Experience Rating Plan to permit recalculation of the modification for risks because of claims being declared non-compensable, court decisions and third party settlements, all of such modifications being one-sided, that is, resulting in a more favorable treatment of the risk. Upward development of losses cannot be, however, recognized under the rules of the present Experience Rating Plan except in subsequent ratings with lesser effect on the result. While one may discount the assertion that companies deliberately underestimate reserves one cannot overlook the fact proven year after year that the first reports of the experience (receiving the greatest weight in the Experience Rating Plan!) are on the whole underestimated, to say the least, to the extent of 5%. It would thus appear that whether deliberate or not, there exists an underestimate of losses and carriers who on one hand complain of inadequate rates, on the other hand display unwarranted optimism in the valuation of claim reserves for individual risks. Enough emphasis cannot be placed on this aspect of the situation since carriers recognizing this condition establish special loadings and reserves for the business as a whole to correct for the shortcomings of individual estimates. The off-balance of the rating plan which has been steadily increasing in the State of New York is, undoubtedly, and to a considerable extent, due to such loss underestimates; and, if one considers that over 70% of the premium volume is rated business, the loss of premium to the companies because of this deficiency in losses becomes quite apparent.*

As regards the complications introduced by the proposed plan, the author wishes merely to say that additional steps do not always complicate matters. The mathematical proof where a number of steps are omitted as very simple will usually add to the troubles of the anyway harassed reader who attempts to follow the proof and its ramifications. "Give to the devil his due" would be a more appropriate attitude in this matter. My critic admits that the Experience Rating Plan is so complicated that it does not lend itself to a simple explanation. Why then worry too much about another wrinkle which is for the good of the business?

Mr. Cahill is skeptical as regards the author's estimate that the cost due to the introduction of the account current method would be only nominal and chooses as an unfortunate illustration the considerably higher than estimated cost of the Unit Statistical Plan. It may be well to state that the author's estimate of the

* In the New York rate revision effective July 1st, 1934, it was decided to introduce a flat factor of 1.05 to be applied to losses to correct in part for this condition.

cost was based on the work needed in connection with approximately 500 account current ratings but even assuming that there will be need for additional expenditure of several thousand dollars it would be certainly a worthwhile expenditure if the premium income of the companies would be increased by possibly as much as $1,000,000.** Truly such economy would be more than shortsighted. It seems to the writer that the carriers should welcome the means of getting the premium wherever and whenever it is due instead of trying to make up by higher manual rates several years later.

The author agrees with Mr. Cahill that the proposed plan has certain serious disadvantages like the inability to reflect payroll trends and the injustice which might arise to carriers due to shifting of business but even on this point it might be safe to say that in the long run and with sufficient volume of business these elements will tend to offset one another.

Last but not least, may I be permitted to correct my critic's impression as to the chronological order of events. The account current correction of the Experience Rating Plan was presented by the author to the Actuarial Committee of the New York Rating Board several months before any thought was given to the question of rate level.

## ON INDETERMINATE CLAIM RESERVE TABLES FOR COMPENSATION— NELS M. VALERIUS, VOL. XX, PAGE 82

### WRITTEN DISCUSSION

### MR. A. N. MATTHEWS:

In his opening paragraph, Mr. Valerius states his problem as that of setting up reserves which will represent as nearly as possible the correct ultimate cost of compensation claims. He further states that such reserves are necessary for: (a) financial statements, (b) calculation of manual rates and (c) experience rating. No further mention is made regarding the necessity for correct reserves for statement and rate making purposes, but the paper deals entirely with the matter of values to be used for experience rating. Possibly the reason for this omission is that

** This estimate is based on a premium volume of about $50,000,000, a loss underestimate of 5% and average credibility of .55.

insurance laws require that compensation reserves must be calculated on a case basis and it is doubtful that insurance departments would favor the use of average values. Furthermore, in connection with the calculation of manual rates, the Schedule "Z" instructions do not permit the use of average values. The only exception to this general rule is in Pennsylvania where such a table is used in connection with certain cases.

In connection with experience rating it will be agreed that the ideal situation would be attained if each case could be used at its ultimate value. Mr. Kormes has attempted to approach this condition by means of his "account current" method of experience rating. In the experience rating of the average compensation risk cases of an indeterminate nature are encountered rather infrequently but when they do appear it is important that they be given an estimate which will approximate the ultimate cost as closely as possible. Mr. Valerius' tables take into account only the attained duration, whereas under the present system of adjusters' estimates, the adjuster has the benefit not only of the duration of disability but also of a knowledge of the condition of the injured at the time the estimate is made. Accordingly, it would be reasonable to expect that adjusters' estimates would more closely approximate the ultimate cost of the individual claim than would values taken from a table.

In order to determine whether the indeterminate reserve table produces a closer approximation to the ultimate incurred cost for the average case than does the estimate made by the adjuster, a test has been made on the basis of 200 cases which were settled by The Travelers during the past year and for which the duration of payments was in excess of 26 weeks. The results of this test are shown below:

| Attained Duration (Weeks) | No. of Cases | Average Actual Duration (Weeks) | Average Estimated Duration | Average Tabular Duration (from Table I) | Mean Deviation of Estimated from Actual Duration | Mean Deviation of Tabular Values from Actual Duration |
|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| 26 | 200 | 148 | 72 | 114 | 98 | 70 |
| 52 | 176 | 163 | 127 | 182 | 84 | 76 |
| 104 | 121 | 201 | 200 | 299 | 63 | 111 |
| 156 | 79 | 240 | 250 | 356 | 43 | 130 |

It is seen that for these particular claims, both the average estimated duration at 26 weeks and the average tabular duration are less than the actual duration. At this stage of development the table produces on the average more accurate reserves than those estimated by the adjusters. This is also the case at 52 weeks, although to a lesser extent. At 104 weeks and 156 weeks the adjusters' estimates are much closer to the actual cost than are the values taken from the table. This study would lead to the conclusion that it would be desirable to use an indeterminate table during the first year after date of accident, but subsequent to one year more accurate results are obtained on the basis of adjusters' estimates.

As a further argument for the use of an indeterminate table Mr. Valerius used the fact that the experience rating plan has in the past produced an excess of credits over debits. Undoubtedly this condition has been due to some extent to the use of inadequate estimates in connection with open cases. However, a probably more important cause of this off-balance is the fact that in most states the experience of large risks has been in general more favorable than that of small risks. The compensation rate level, which has been based upon the entire business, has been somewhat redundant for experience rated business resulting in a credit off-balance. This condition has been recognized and taken into account in the compensation rate-making procedure and the experience rating off-balance is no longer responsible for the inadequate compensation rate level.

If in the future it should be decided that it would be advisable to use indeterminate reserve tables for compensation experience rating, the method outlined by Mr. Valerius would be of very much assistance and the tables would furnish a means of testing the effect of the use of tabular values on the experience rating results. Furthermore, these tables may be of use to the claim departments of the carriers as supplementary evidence to substantiate the reserves used in various cases.

MR. RALPH M. MARSHALL:

The establishment of a table for setting up reserve values for cases which are still indeterminate at the time of valuation is one which has been discussed at various times in the compensation business. Although the subject is not new, this is, I believe, the first time that any figures based upon actual experience have been made generally available. I am sure the Society is greatly indebted to Mr. Valerius for his presentation and thorough analysis of the data.

In this discussion I have attempted to give only a brief summary of the principal features of the paper as presented by Mr. Valerius with certain comments thereon which it is hoped will focus attention on these points and may, at the same time, serve to give some theoretical explanation of some of the results noted by the author.

The theory underlying the tables presented is that, on the average, there is a definite relationship between the length of time the case has remained indeterminate and its future duration; so that the second can be predicted by the first. The tables given were obtained by adding cumulatively the number of cases and the indeterminate and total durations starting with the cases of the longest indeterminate duration. The average total duration given for each period of indeterminate disability is the average of the total durations of all cases whose indeterminate disability lasted at least as long as the indeterminate period under consideration. Therefore as we move up the table, starting with cases of longest attained indeterminate duration, the total durations given are the averages of frequency distributions with an ever increasing dispersion. Or, in other words, the probable error of the total duration increases as the attained indeterminate duration at which the table is entered decreases. It might be expected therefore that for cases where the duration of attained indeterminate disability is relatively short, an individual estimate, based upon a knowledge of the nature and location of the injury, and the age and general condition of the injured man, might hit nearer to the actual experience than a tabular value depending solely on the attained indeterminate duration at the time of valuation. This was found to be the case in a test described by Mr. Valerius which was made by comparing on a limited sample the relative fit of tabular values and estimates made upon an individual case basis. It was found that the estimates had smaller average deviations than the tabular values particularly at the shorter indeterminate periods.

Originally the main purpose suggested for an indeterminate reserve table was in assigning values to individual cases for experience rating purposes. As the author suggests the considerations mentioned above raise doubts as to the feasibility of making the plan obligatory for this purpose. Indeed, as the author points out, from one point of view the use of tabular values would be contrary to the principles of experience rating. The experience rating plan compares the experience of an individual risk with the average experience of all risks of the same classification. Any modification which substitutes average values for actual risk experience would be contrary to this basic principle and detract from the comparison to that extent.

A second use advanced for an indeterminate reserve table was in compilation of Schedule "Z". Mr. Valerius found in his test of the table presented that, although the results on individual cases deviated considerably from the actual experience, the tabular values gave somewhat truer results in total than the individual case estimates. This suggests that the use of the table would be feasible in compiling Schedule "Z". The author states that "Reserves calculated by the proposed method should take care of the factor of reopened cases and be adequate in total under reasonably stable conditions." As I understand the proposal, the table would apply only to cases which were indeterminate at the date of valuation. Therefore I do not see how the use of this table would make allowance for the cost of reopened cases which were considered closed at date of valuation. In the present compensation rate-making procedure the effect of cases reopened within 5 years from the beginning of the policy years is brought in by the development of losses to an "ultimate" basis.

Mr. Valerius indicates that variations might be expected due to the influence of one or more of the following factors:—

| | |
|---|---|
| State Act | Part of Body |
| Industry | Age |
| Nature of Injury | Sex |

He has made investigations of the effect of each of the above factors within the limitations of the data. It was found that for the same duration of indeterminate disability the total duration is longer in New York State than for all states combined. It must be remembered, however, that in New York the amount of compensation for total disability is unlimited, whereas in certain of the other states it is limited either by maximum duration or maximum amount. If the duration used in the tabulation depended upon the maximum imposed by the state act rather than the actual duration of disability, this artificial shortening would be reflected in a varying degree throughout the table. The result would be that the average total durations would be less than those found in a state like New York where these limitations by the state act do not apply. In addition to differences due to the purely statistical effect of the compensation law, there might be some difference due to a possible tendency to malinger in cases where compensation continues for the full duration of the disability.

It was my thought at first that differences due to state compensation acts could be avoided by correcting the data prior to tabulating in such manner that the resulting table would apply to an "unlimited" compensation act; or in other words the tabular durations would be actual durations of disability and not influenced by the compensation act. Then in applying such a table to individual cases the limitations of the compensation act would be observed. Further consideration, however, showed that in states where the duration of compensation is limited by the compensation act, the use of such a table would on the average overvalue the reserves. Take for example a compensation act which limits compensation to 300 weeks. Suppose further that we have a number of indeterminate cases to value at a period of 100 weeks giving an average total tabular duration of, say, 290 weeks. This 290 weeks is the average of a distribution of total durations which range from slightly over 100 weeks to a considerable period beyond 300 weeks. In other words the cases we desire to value all range in actual duration from say 100 weeks to 600 weeks of actual disability; but the duration of compensation would vary from 100 to 300 weeks and the average duration of compensation would be much less than 290 weeks. If we used the tabular duration of 290 weeks for each of these cases the total reserve would be overstated by the product of the number of cases and the difference between 290 and the average period of compensation. It would therefore appear to be necessary to construct separate tables for states grouped according to the provisions of the compensation acts.

The following considerations are probably not of importance at the present time, but it should also be noted as the author points out, that in cases involving life contingencies with reserves set up on a present value basis, the method of tabulation carries over the expectation or probable value and discount into the tabular reserve. It is presumed that certain other cases of long duration are included on a non-discounted basis. If this be so, the effect is that a reserve obtained from the table would be on a partially discounted basis, and it would be difficult to determine what adjustment to make to obtain the present value if the full discounted basis were desired. This of course does not affect the validity of the various comparisons which the author makes in his investigation and from a practical viewpoint it might be an advantage to have the table prepared in this form, depending upon the extent to which this corresponds with actual carrier practice. Furthermore the reserves in these life contingency cases depend upon the age of the injured person. If there were a large number of such cases in the data tabulated, this consideration would be unimportant; if there were only a few such cases, the sample might not be representative, thereby raising the possibility of distortion at the longer durations.

As to the effect of the other factors mentioned, the author finds that differences do exist at the lower durations but that, with exceptions in the case of back injuries and skull injuries, "almost certainly a tendency has been confirmed for differences of origin of the disability and other circumstances to fall away before the one factor of their long continuance". It would be interesting to see the effect of a tabulation by period to determine if the depression has had any marked influence.

Mr. Valerius states that it was his intention to present exhibits showing the essential features and form of an indeterminate reserve table, together with the influence of some of the factors previously mentioned, rather than finished tables. He has succeeded admirably in this undertaking and at the same time has focused attention on certain shortcomings of such a table for the purpose of experience rating. Mr. Valerius suggests that such table will be found chiefly valuable in the claim departments of the carriers and as supplementary evidence as to the appropriateness of reserves for various cases. The extent of such usefulness must of course be determined by the carriers for themselves.

MISS EMMA C. MAYCRINK:

Those of this Society who are concerned with the problem of reserves for workmen's compensation insurance should feel indebted to Mr. Valerius for his paper with the experience of the indeterminate disability cases of the Aetna Life Insurance Company for the years 1923-1929 which is given therein.

Since the paper consists principally of tables of data with explanations of their contents and the methods of compilation, there appears to be little room for discussion.

The following comments, therefore, are made particularly to suggest that this study which comprises the experience of 1923-1929 might well be continued in order to compare similar cases of indeterminate disability arising within the 1929-1935 period, and also to suggest that other companies writing a sufficiently large volume of compensation insurance might find it worth while to tabulate similar data. A survey of experience subsequent to 1928 would demonstrate the effect upon reserves of the change in economic conditions when compared with the data for the previous period. Undoubtedly, durations of disability will be prolonged in the later period, whereas comparisons with other companies' averages would probably indicate differences in average durations due to different methods in handling claims as, for instance, medical care. It would seem that such comparative data would be necessary in order to ascertain whether or not the use of tabular values, at least to some extent, would be practicable. The present method of estimating all individual claims is time-consuming and depends to a large extent upon individual judgment. The weakness of the present method is well understood not only in the case of compensation but in liability claim reserves particularly when the question of a company's solvency must be determined.

It is significant to note that in the early days of workmen's compensation insurance the papers read before this society which are found in the first and second volumes of the *Proceedings* indicate that, originally, the trend of thought with regard to compensation reserves was that tabular values could be established from the experience of companies doing business under the various compensation laws in this country. At that time there was not enough experience developed to fix average values with any degree of certainty. The method of valuing cases involving dependents in case of death and of permanent total disability was to use tabular values based upon foreign experience involving the rate of death and remarriage and these values set forth in Bulletin 120 of the Department of Labor have been required since the inception of the Compensation Law in New York State. This has made for uniformity in setting up reserves for the cases of the greatest cost and longest periods of payments and the reserves have been accepted by supervising authorities without question.

The shorter temporary total or partial disability cases and those involving specific schedules of benefits for dismemberments have not been difficult of determination, because the former are quickly eliminated from the reserve by payments, and the latter cases have limits in that a definite number of weeks is stated in the law. With these classes of benefits determinate there still remains a large part of the outstanding cases which are of an indeterminate nature. The methods of setting up reserves for such cases are various. Diverse methods are due largely to the difference in the statutory requirements for reserves. The New York law governing reserves of stock companies writing Workmen's Compensation Insurance is primarily the loss ratio method, which was originally devised for the determination of reserves for liability and which, subsequently, was applied to workmen's compensation insurance reserves. The obvious defects of this method have been recognized both by the carriers and the supervising authorities. The law was modified to the extent of giving the Superintendent of Insurance the right to call for a different method of valuation if the statutory method which is incorporated in Schedule P of the Convention blank proved to be inadequate. Consequently, the blank calls for an additional or "voluntary" reserve which is based finally upon individual estimates of outstanding claims. Such reserves may be challenged since they leave room for wide differences of opinion. These estimates range the entire gamut from the values conjured by the optimistic claims adjuster to the values set up by doubting Thomases in the guise of insurance department examiners.

The situation with regard to the mutual companies writing workmen's compensation insurance is somewhat different. In New York State, the reserves for compensation losses may be prescribed by the Superintendent. The method used from the time mutual companies undertook the writing of workmen's compensation insurance required first a classification of claims by nature of injury and to a large extent the reserves so classified have been set up by the use of average values. Different values are used for different classes of injuries in what is known as Schedule R.

It is by no means the purpose of this discussion to compare the reserves resulting from the various methods, but it is rather to suggest that the idea of tabular values is deserving of attention. Most of the effort to date has been spent in an endeavor to perfect the formula or Schedule P method.

Mr. Valerius gives three reasons for fixing reserves that reflect the ultimate cost of indemnity as correctly as possible. These reasons are so important that they will bear repeating.

1. Correct reserves are requisite to the sound financial and underwriting management of the carriers.
2. Reserves in terms of incurred losses reported to rate-making organizations affect manual rates.
3. Reserves of individual risks reported under the experience rating plans affect the departures from manual rates assigned to qualifying risks.

The first reason is so obvious that further comment need not be made except to say that if there is any uncertainty as to the reserves it is by far the best policy to have redundant rather than deficient reserves.

With regard to incurred losses reported to rate making bureaus particularly in the states where the law requires a fixed rate, it is axiomatic that if reserves for incurred losses are materially underestimated, the rates will be inadequate even though development factors are used.

It is in connection with experience rating that the most cogent argument for tabular values based on averages for cases of indeterminate disability can be made. If such values are used the reserve will increase gradually as the duration of disability is extended. The Compensation Insurance Rating Board in New York uses the data reported under the unit system (Schedule Z) for experience rating. This appears to be an improvement over the former method of reporting experience rating data separately. It is probably true that one of the reasons for the excess of credits over charges which has been almost invariably the result of experience rating is partly due to competition. There is always the temptation to minimize bad experience by placing low estimates on losses of an indeterminate nature when the individual rate for a risk will be adversely affected. The mechanical nature of the tabular values would tend to discourage the temptation to hold business by underestimating reserves. The author of the paper under discussion states, however, that difficulties arise not only because of cases where the disability is indeterminate but where there is a legal question as to whether or not there is any liability at all, as in third party cases and claims contested on legal grounds. A conservative company will set up a reserve for such claims and the effect in the long run upon surplus or upon rates will be almost negligible, but the effect upon the experience rate may be quite material for the years in which such reserves are added to or dropped from the risk experience. The use of tabular values will not solve this problem although some of these cases are indeterminate as to disability as well as to legal status.

One of the reasons advanced for not adopting tabular values of indeterminate disability cases in connection with the experience rating of risks was that there was not sufficient experience upon which to base such values. It would seem that by making a tabulation of the entire business upon a uniform basis there should be sufficient volume in a state as large as New York.

It is probably unnecessary to stress here that the method of determining workmen's compensation reserves is an actuarial problem. It behooves us then to continue to seek, by means of such studies as the one Mr. Valerius has described, to find a more satisfactory method than that of individual estimates of claims wherein single estimates can be picked out and challenged with the result that the whole method is under suspicion. At least average values based upon actual experience and corrected from year to year for trends would furnish evidence to justify the total reserves, which is after all the ultimate end of any method.

AUTHOR'S REVIEW OF DISCUSSIONS

MR. NELS M. VALERIUS

I thank Mr. Marshall for calling attention to a misstatement in the paper, affording me an opportunity to correct it. In stating on page 83 that "reserves calculated by the proposed method should take care of the factor of reopened cases", I had in mind that totals of individual estimates usually require some loading for remote contingencies and further developments whereas totals of tabular reserves should reflect ultimate dispositions of cases under the proviso that tables be constructed from mature experience. The statement in its context implies that reopening of cases closed at the time of reporting is provided for, which was not intended.

Miss Maycrink and Mr. Marshall mention the economic cycle as a factor to be investigated in addition to those considered. Practically all the accidents used, policy years 1923-1929, occurred in the same broad phase of the cycle. The experience of the deep depression policy years is not yet available in matured state. The effect of the economic cycle is not a simple question, since the longer drawn-out cases occurring in one phase of the cycle may extend into other phases.

It is interesting as Miss Maycrink notes that, in the early days of compensation and of the Society, tabular reserves were contemplated as practicable and desirable. The system of individual estimates has apparently been found more satisfactory than was then thought would be the case.

Mr. Matthews has presented the results of a comparison of individual estimates and values from Table I upon a limited number of claims of the Travelers. In this test the tabular values are found to be better than individual estimates at 26 weeks and 52 weeks, the relation being reversed at 104 weeks and 156 weeks. I do not believe this result can be checked with theory: as Mr. Marshall has expressed it, we might expect an increasing dispersion with the increasing range of the final durations and a corresponding increasing probable error in the average durations or tabular values as we pass from the longer to the shorter attained indeterminate durations. There may seem to be an element of begging the question in this reasoning, namely, that the total duration is assumed to depend on the indeterminate duration, but it does depend on it to the extent that it cannot be shorter than the indeterminate duration (the indeterminate period has been taken as the period of payments on an indeterminate basis, not time elapsed to settlement). I understand that the claims used by Mr. Matthews were all closed as temporary total. This is a type of selection and invalidates the result to an extent. In using a table during the currency of indeterminate disabilities, it would be applied to future permanent partial, permanent total, and fatal cases as well. The array of the cases is far different from the array underlying the tabular values; of 200 cases indeterminate at 26 weeks in Mr. Matthew's tabulation 40% are still indeterminate at 156 weeks, whereas in Table I only 4% remain indeterminate. Perhaps the result is to be interpreted as evidence that differences of classification and practices between companies require separate tables.

It is possible that tabular values compare most favorably, claim for claim, as against individual estimates, at some intermediate interval, say at durations of three-quarters of a year to a year and a half, when the disability has lasted long enough to make a very serious result probable and yet it is not definitely indicated that the limit of compensation will have to be paid.