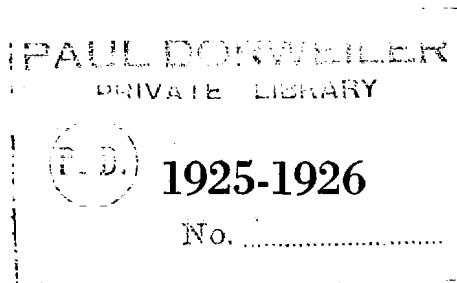


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## PROCEEDINGS

NOVEMBER 18, 1925

## ON THE USE OF JUDGMENT IN RATE MAKING

PRESIDENTIAL ADDRESS, G. F. MICHELbacher

## I

“Rate making” is an expression which may have several interpretations. It is desirable, therefore, to define it at the outset so that there may be no misunderstanding concerning the scope of the subject which is to be discussed. For the purpose of this paper the term will be considered to comprehend the entire process of determining the price of insurance for an individual risk. Accordingly, it refers not only to the establishment of manual classifications and average manual rates but also to the development of merit rating systems which may be utilized for the purpose of taking into account those peculiar characteristics of individual risks which are susceptible of measurement.

From this point of view the distinction between underwriting and rate making is that the underwriter selects the risks which are acceptable to his employer, while the rate maker determines the price of insurance for each of these risks. This distinction is noted because the question of the extent to which underwriting depends upon the use of judgment is not under consideration.

There is no intention to imply that underwriters should be barred from the field of rate making; the same person may perform both functions. It is necessary, however, to limit the discussion, and for this purpose it is desirable to recognize that underwriting and rate making are two separate functions each of which presents its own peculiar problems.

## II

The object of rate making should be to produce sufficient funds to enable the insurance carrier to discharge fully the obligations

arising under its policy contracts and to continue effectively the services which are essential to the insurance transaction; but the results of rate making must be such that the burden upon policyholders of providing these funds is not excessive, and it is also extremely important that the contribution of each policyholder shall be equitable, thus avoiding the injustice which would follow if one policyholder were assessed too little and another too much. The responsibilities of the rate maker may be summed up in the familiar legal requirement that insurance rates must be adequate, reasonable and non-discriminatory; adequate for the insurance carrier, and reasonable and non-discriminatory for the policyholder.

These criteria are not provided merely for the guidance of rate makers as desirable ends to be achieved. They constitute rigid requirements which must be met. Under the conditions of state regulation, which are coming more and more to govern our rate making activities, the rate maker must demonstrate that the results which he produces conform to these tests. He cannot maintain his position successfully unless he is able to convince the various parties in interest that this is the case.

There are, in addition to the three fundamental criteria, three very important practical considerations which the rate maker must observe. First, there must be consistency in his methods; second, his procedure must be flexible enough to respond to developments in the business which affect the cost of insurance; and, third, rates must be reasonably stable, and not subject to abnormal fluctuations. Consistency is required in order that confidence may be engendered. If the plan of rate making lacks uniformity and different principles govern the procedure each time rate changes are made it is likely to be said that rate makers do not know their own minds. There would be a lack of faith in results produced by an obvious process of experimentation. Responsiveness is important because it is quite apparent that the cost of insurance may vary on account of changing conditions, and that rates must follow these changes, not only with fidelity but also with reasonable facility; otherwise one party to the insurance contract or the other would be injured. Stability is essential since radical changes are disturbing to carriers and to policyholders alike. A plan which produces a substantial increase in rates one year, and an equally substantial reduction the

next year, would be branded as erratic. If there are trends in cost they should be reflected gradually, and without revolutionary variations which are difficult to defend.

Surrounded by these limitations, the task of the rate maker is not simple under the most favorable conditions. It happens that there are further factors in the rate making process which make his position even more difficult.

### III

In present practice it is necessary to name rates at the inception of the insurance transaction, and in the case of stock companies at least, these rates are "guaranteed"; that is to say, they may not be increased, no matter what may develop during the period of coverage. There is, therefore, an element of uncertainty in rate making—uncertainty as to what effect, if any, the conditions of the future may have upon the cost of insurance—and this is magnified in our field of casualty insurance by startling fluctuations in cost which are likely to occur, particularly in such coverages as workmen's compensation insurance, the cost of which seems to respond to the slightest changes in economic and industrial conditions.

Not only does this uncertainty concerning the future exist but it has been impossible to devise statistical and accounting methods which are flexible enough to develop the current experience of the carriers so that the cost of today may be ascertained. The best that can be done, at least so far as the statistical basis underlying manual rates is concerned, is to develop the experience of the latest complete policy year. The gap between the known and the unknown is thus materially widened so that the rate maker in his efforts to predict future cost must handicap himself at least one year. Instead of standing on the mark represented by current cost he must retire to a mark represented roughly by the experience of a year ago, and it is from this point, and with the knowledge available as of that date, that he must make his calculations. Compared with other business forecasters the insurance rate maker, therefore, holds the record for long distance prognostication. The expert whose problem it is to forecast the trend of prices or production always knows conditions as they exist today, and with this knowledge,

supplemented by such evidence as he may care to obtain concerning the conditions of the past, he attempts to say what may be expected to happen within a future period of from one to six months' duration. The problem of the rate maker is much more difficult, for the range of his predictions is from twelve to thirty-six months, and perhaps longer, particularly in those cases where policies are written for periods of three years.

#### IV

Confronted by this perplexing situation rate makers have experienced some difficulty in deciding how best to proceed to a solution of their problem. The result has been the formation of several distinct schools of thought.

At one extreme are those who hold to the principle that rate making should depend primarily upon the use of reasoning power and instinct, and only secondarily, if at all, upon statistical facts concerning the cost of insurance in the past. For these persons "judgment" is the guide. Individual risks are rated as they come up in the course of business, not by recourse to mathematical calculations involving statistical facts, but by the exercise of personal judgment acquired from actual contact with the problem. The rate maker of this school must be captured while young, and must serve a long apprenticeship before he is permitted to display his skill in the determination of rates.

This system is marked by a lack of detailed statistical data concerning insurance cost. The results of rate making are tested by the aggregate experience of the carrier; if income unduly exceeds disbursements, rates are too high; if the reverse is true, rates are too low. The correction in either case is applied by a modification of the rate maker's judgment. If he seems to be naming individual rates which are too high, he becomes more liberal; if results show an underwriting loss, he becomes more conservative. In each case the remedy is found in a change in mental attitude. There being no thorough statistical analysis of the problem it is impossible to ascertain whether the relationships which have been established between classes of risks and between individual risks are logical and consistent. The aggregate loss ratio governs, and, as this must be kept within reasonable bounds at all hazards, sweeping changes in procedure are likely to be made when in fact the proper remedy

may often consist in a minor change affecting one class of risks, or perhaps all of the risks in a given locality.

At the other extreme are those who feel that judgment should be eliminated entirely, and that rates for the future should be obtained by a more or less mechanical process employing known statistical facts representing the cost of the past. Whereas one school would cut loose entirely from statistics, believing that the rate maker by using his personal judgment is better able to cope with the uncertainties of the problem, this school would hold fast to statistics as the one and only basis of rate making, choosing what is known as a guide, and refraining from conjecture as to that which is unknown, and, therefore, is not susceptible of statistical measurement.

This system requires the development of elaborate statistical data analyzed to the utmost extent. In fact the burden of effort falls upon the statisticians, for, when complete data are available, rates are determined by a process which is practically automatic.

## V

Here are two extreme conceptions of rate making—in one case judgment rules supreme, in the other it is, in effect, eliminated. Which is the correct system; or is it possible that the correct system may lie somewhere between the two extremes? The question being a controversial one, all that can be attempted is an expression of personal opinion. Such an expression will be presented, together with a statement of reasons supporting it.

It has been shown that the rating system must meet the tests of consistency, responsiveness and stability, and that the rate maker must be able to demonstrate that the rates which are produced are adequate, reasonable and non-discriminatory. How do the two systems which have been described conform to these requirements?

## VI

Judgment rate making may possess a measure of responsiveness, but it cannot claim stability or consistency; it may produce rates which are adequate and reasonable when viewed in the light of aggregate results, but it is not likely to produce individual rates which are equitable and non-discriminatory; it does not contain within itself characteristics which render possible a satisfactory demonstration of method and results.

It is a well known fact that two persons thinking independently about a certain problem will probably arrive at different conclusions, or, if they should accidentally concur, it is not likely that the mental process was exactly similar in both cases. Not only does this difference occur as between two individuals; it may also be demonstrated where a single individual attempts, by reasoning alone, to solve several distinct problems. This has been recognized, for example, by the establishment of standards of weight and measurement which are useful in order that we may all agree in our concepts of certain things. There being no such standards in judgment rate making, consistency and stability are impossible of attainment.

This lack of standards may also lead to erratic results. Confronted by the necessity of correcting a variation in loss ratio from what is considered normal, the rate maker may allow himself to be carried away by his judgment, and the remedy which he seeks to apply may cause the pendulum to swing sharply in the other direction.

Then again his diagnosis of the difficulty may be erroneous. Prejudice against a locality or against a given class of risks may lead him to apply the corrective treatment in the wrong place. We have all witnessed examples of this; one rate maker whose experience has been good in a certain locality is extremely optimistic in the determination of rates for that locality, while another, equally intelligent and skilful but with the remembrance of an unfortunate experience in the back of his mind, may look upon the situation from an entirely different point of view. Thus, while responding to a warning that the experience is trending either in one direction or another, the rate maker may correct the loss ratio so that rates in the aggregate will be proper, but in doing so he may do violence to individual risks, thus producing a most inequitable distribution of the burden of cost.

Where judgment rules, differences of opinion are certain to arise. If, therefore, a group of rate makers should seek to cooperate, the result would be either absolutely irreconcilable differences of opinion, or else a compromise which would probably be somewhat out of line with the correct solution of the problem. But even assuming that an agreement could be reached among rate makers, there would remain the necessity of demonstrating the correctness of rates to state authorities. It is all very well to

say that a given process of reasoning produces a certain result, but it is not so simple a task to guide another over the same mental route to the same conclusion. It is likely, therefore, that the judgment of the state authorities, which might be colored by political motives or by considerations of expediency, would be substituted for the judgment of the rate makers, or that a further compromise would be required, thus producing a still further deviation from the correct solution of the problem.

It is to be severely doubted whether rates produced by this process would ever prove correct as a measure of future cost conditions. Those who criticise existing methods in the field of casualty insurance and advocate the use of fewer statistics and more judgment, overlook the sad fact that wherever rate makers have sought to proceed upon pure conjecture they have found that their predictions were wrong when the experience has matured. For example, where an increase in cost has been anticipated, a decrease has resulted from the injection into the situation of factors which were not even considered. This should not be taken in the nature of personal criticism, for our rate makers are extremely capable men; rather it should be taken as proof of the contention that under the complicated and ever changing conditions which obtain in the casualty insurance business it is practically impossible to forecast accurately what the future trend of cost will be.

## VII

The chief merit of the system which depends upon statistical analysis is that it reduces rate making to a formula. Provided this formula is not changed too frequently, the method possesses both stability and consistency. Because there is a logical plan of procedure, it is a simple matter to demonstrate the steps by which the final results are obtained. If the plan is accepted as correct, the results also must be accepted as correct. It is unnecessary to spend time in lengthy debate for the purpose of reconciling divergent points of view as to how best to overcome an obstacle which may arise at some stage of the process. The task of the rate maker is thus rendered comparatively easy. The facts are ascertained; they are then subjected to treatment in accordance with definite principles agreed upon in advance;

the results are absolutely defensible, and will probably be accepted as proper without extended controversy.

In this process the greatest degree of equity is obtained as between classes of risks, and between individual risks of the same class, for discrimination is permitted only where it may be justified on the basis of an actual difference in hazard.

So far the system is above criticism. The problems now arise as to whether the method can be made sufficiently responsive, and whether it may be depended upon to produce rates which are always adequate and reasonable. In the absence of any known method of correlating insurance costs with phenomena, the trends of which may be predicted, the facts which are available to rate makers are embodied in the statistical experience of the past. If conditions were uniform from year to year, the statistical method would produce correct results for the future. But where conditions are changing, a gap exists between the past and the future, and there is always a question as to the fidelity with which known facts, represented by the past experience of the carriers, are a proper guide to the uncertain experience of the future. If there is a continuous trend either in one direction or the other, rates based upon past experience will never quite "catch up" with current costs. If the variation is cyclical it is not likely that the available experience will represent the phase of the cycle which is imminent.

It should be possible to devise a formula which will reflect variations of this character so that an annual review of experience and a consequent revision of rates, will keep current rates reasonably in touch with changes in conditions. But it is quite apparent that it is extremely difficult, if not impossible, under these conditions to produce rates which are constantly adequate and reasonable year in and year out. Some latitude must be permitted for variations are bound to occur. The real test must be whether the process over a period of five or ten years has produced rates which may be shown to be correct because they reproduce the experience of the period, since the function of insurance is quite as much "averaging" over a period of years as over a collection of risks within a particular year. If this test is met, the other advantages which the statistical method possesses should make it decidedly preferable to the system which is based primarily upon the use of judgment.



## VIII

It must be obvious that the writer's preference is for the statistical method. Yet this should not be taken to mean that he is of the opinion that judgment has no place in rate making. It would be just as foolish to set up a formula, and to use it blindly, as it would be to discard known facts, and to rely entirely upon the exercise of personal judgment. For reasons which have been cited, judgment should be eliminated so far as possible. But it cannot be dispensed with entirely—first, because the facts which are available must be interpreted and weighed as to their adequacy and reliability, and, second, because the number of formulae which may be devised is great and choice must be exercised in the selection of that particular formula which best meets the requirements. In this respect rate makers are in somewhat the same position as the economists, who are concerned today about the relative advantages of what they term "qualitative" and "quantitative" analysis, and to whom Wesley C. Mitchell, speaking as President of the American Economic Association, recently addressed the following remarks:

"In the measure of our proficiencies, we all practice both qualitative and quantitative analysis, shifting our emphasis according to the work we have in hand . . . Qualitative analysis . . . cannot be dispensed with, if for no other reason, because quantitative work itself involves distinctions of kind, and distinctions of kind start with distinctions of quality."

INDUSTRIAL ACCIDENT RATES IN THE BUSINESS  
CYCLEA STUDY OF THE EXPERIENCE OF THE  
CALIFORNIA STATE COMPENSATION INSURANCE FUND

BY

W. G. VOOGT AND A. H. MOWBRAY

In his presidential address at the May 1924 meeting, Mr. Leslie, recounting the future problems of casualty actuarial science, said among other things:

"But there is one that is so appealing to the imagination and that has such potentialities that I can not refrain from mentioning it, if for no other purpose than emphasis. It is the problem of relating the rise and fall of compensation costs with the standard index numbers for certain economic phenomena. . . .the answer is of vital importance to our business."<sup>1</sup>

Others have expressed themselves in like tenor recently.<sup>2</sup>

Believing the experience of the California State Fund peculiarly well adapted for use in an investigation into the question because of the general stability and uniformity of its business and steady regular growth, we have made a study of its experience for the five year period from January 1, 1918 to January 1, 1923 from this point of view. Our results seem to us to have sufficient significance to warrant their presentation to our professional colleagues in this Society. The particular point investigated was the variation over this period in rate of accident per unit of payroll exposure. When determined, this was compared with other data known to vary with the so-called Business Cycle.

## DATA USED

For several years the State Fund has kept a monthly record of tabulatable accidents reported during that month. It has available, also, accident cards on all permanent and death cases showing date of injury, which we in this study have referred to as serious cases. We have in a combination of these records suitable material for allocating all losses, and separately serious

1. *Proceedings*. Vol. X, p. 102.

2. For example see Black—*Proceedings*. Vol. X, p. 45, Whitney—*Proceedings*, Vol. X, p. 148, *et seq.*

losses, to the month of occurrence with only the insignificant inaccuracy involved in the assumption of a uniform interval between the date of accident and the date of report. If we could find a means of determining with sufficient accuracy the payrolls covered by months we could prepare accident rates by calendar months in suitable form to compare with other indices. We had the payrolls only in the form in which they are usually obtained and kept by the other companies, viz., advance estimates and audit corrections, and these were tabulated only by policy years. But by the methods we will describe we approximated to the monthly payrolls, as we believe, with a sufficient degree of accuracy.

For approximating the monthly payrolls we used

1. The initial and deposit premiums as recorded for each of the five years, 1918-1922 inclusive.
2. The additional premiums on periodical adjustments by quarters for the six years, 1918-1923 inclusive, and the first quarter of 1924.
3. The additional premiums on final adjustments by quarters for the same period.
4. The average effective premium rates shown by Schedules Z, 1917 to 1922 inclusive.
5. The pro rata unearned premiums as computed by the Fund at the end of each year 1917-1922 inclusive.
6. Certain data bearing on the seasonal character of California industry which we will indicate in connection with its use.

To permit checking of our work we quote these data in tabulated form in the appendices A to E.

#### DETERMINATION OF MONTHLY PAYROLLS

Our first step in the determination of monthly payrolls covered was the determination of calendar year earned premiums. These consist of two parts,

1. The earned portion of initial and deposit premiums taken *pro rata*, which is easily obtained by adjusting the net written figure by the balance of unearned at the beginning and end of the year.
2. That portion of the periodic and audit adjustments due to payrolls covered in the calendar year. This latter required some analysis of the Fund's business and certain assumptions based thereon.

It was found by study that the great majority of periodic adjustment policies were issued on a quarterly basis. It was also found that on the average there was a month and a half from the time the reports were due (shortly after the close of the period) until the bills were sent out and premiums entered up. On this basis we felt justified in assuming that the whole of the additional on periodic adjustments of the first quarter of any year and one-half of those of the second quarter were earned in the preceding year and that the remainder were earned in the current year. A similar investigation of the annual adjustment business showed a lag of three months between the expiration date and the billing. On this basis and the assumption of uniform distribution of earnings over the policy year these additional premiums were apportioned as follows:

Quarter	Assigned to preceding year	Assigned to current year
First.....	All	
Second.....	21/24	3/24
Third.....	15/24	9/24
Fourth.....	9/24	15/24

The total of these last two gave the second part of our earned premiums. We admit there is chance for some error here but we do not believe it introduces serious inaccuracy.

Having thus obtained our earned premiums for each of the calendar years, we proceeded to convert them into the equivalent payrolls by dividing by the effective rates. Since the experience reported in Schedule Z for any policy year covers a portion of two calendar years, a given calendar year is covered by parts of two Schedules Z. We assumed as the effective rate for each calendar year the mean of the effective rates for Schedule Z for the preceding and current policy years. The detail is shown in Appendix C. Appendix D shows the annual payrolls thus derived.

If there were no seasonality in business activity we might take one-twelfth of the annual payroll as the monthly payroll, but since certain industries in California are peculiarly seasonal an adjustment for this was made.

We found that in Vol. IX p. 86 of the *Fourteenth Census of the United States* there is shown a tabulation of the number of

employees of California factories for each month of the year 1919 and in a separate volume dealing with mining and quarrying similar data are given for those industries. For the year 1921 similar data are given in the *Biennial Census of Manufacturers* (pp. 1290-1-Table 1038). As a test on these data we examined the actual audits of a large number of policies representing about 30% of the issues of 1922 to determine the seasonal spread of payroll. The several sets of seasonal indices were very similar yet with some differences. We did not feel justified in rejecting any of them as incorrect for their own year for some change in seasonality from year to year is to be expected. We, therefore, used these several indices for the years named. For the year 1918 we used the 1919 index and for 1920 the mean of the 1919 and 1921 indices.

The monthly payrolls as we have thus derived them are shown in Appendix E. We believe these figures represent as accurately as we could obtain them the actual payrolls covered, but we have submitted in this detail a description of our methods and the figures we used, in order that they may receive full criticism, and that such suggestions for improvements in the technique as may be called for by any weakness we may have overlooked may be illustrated by use of our data. We believe our results justify us in recommending the use of this method, as it may be improved, to other investigators of this problem.

#### ACCIDENT RATES DEVELOPED

The numbers of accidents by months are shown in Appendix F and the accident rates in Appendix G parts 1 and 2.

#### ANALYSIS OF ACCIDENT RATES

After careful study of these rates by the graphic method we were unable to determine any trend (independent of cyclic movement) either up or down. We have, therefore, taken it as level. In California the compensation law first came into effect in 1911 and was well known before 1918. Safety work has been actively carried on for many years and may be considered to have reached a temporary saturation point before 1918. This we feel justifies us in not allowing for trend.

A seasonal movement will be apparent in these rates which at

first puzzled us because we had allowed for seasonality in determining payrolls. But on studying the matter further we reached the conclusion that it was reasonable to expect this. Many of the more hazardous industries in California are seasonal in character and the increase in activity among these in the summer would tend to increase the average accident rates. We therefore applied a seasonal correction based on the simple method of monthly means. The results are shown in Appendix H parts 1 and 2 and graphically in Chart I.

Because of the irregularity of the series we have smoothed them somewhat by the use of a three months' moving average in the case of the total accident rate, and a five months' moving average in the case of the serious accident rate. We have also smoothed the all accident rate by a five months' moving average and computed the coefficient of correlation between the two series as so adjusted, finding it to be .823, indicating a high tendency for the serious accident rate to conform to the all accident rate.

#### COMPARISON WITH INDEX OF PRODUCTION

Examining Chart I it is evident that both these rates varied approximately with the swing over the business cycle and the remaining problem is comparison with indices of other aspects of the cycle. Naturally the first index we would use would be one of physical volume of production. No such index for California exists, but Professor E. E. Day has computed an index for the Volume of Manufacture for the country as a whole. A description of the composition of this index and the values from January 1919 to November 1922 are given in the *Review of Economic Statistics*, Preliminary Volume 5, pp. 30-60 inclusive.

Chart II shows a comparison of it with the All Accident Rate. Correlation is evident, we think, but the accident rates do not follow the deep dip in 1921. An examination of Professor Day's article shows this to be due to low production in "Basic Materials and Pig Iron" not typical of California industries. Professor Day also shows an index for consumption goods which is compared in Chart II with the serious accident rate. While the correspondence is closer, Day's index shows higher movement in 1921 and 1922 than our accident rates.

An examination of the make-up of this index shows that the industries used are not generally typical of California, and we felt

some more characteristically California index should be found. We would have preferred a combination of freight car loadings and building permits, but the former were not available and the rapid development of the latter after 1919 was so great as clearly to require correction for trend and yet it was so recent as to make the determination of trend all but impossible.

We finally felt compelled to fall back upon bank clearings which measure the financial results of industrial activity though combined with other influences. We, therefore, took the clearings (as reported monthly in the *Commercial and Financial Chronicle*) of the five California cities of San Francisco, Los Angeles, Oakland, Sacramento, and Fresno, representing the bay region, Southern California, and the two interior valleys. These, after correction for price level, trend, and seasonal variation, we have shown in comparison with both accident rates in Charts II and III, in the former with Day's production indices, in the latter for sharpness of comparison, alone. The clearings series itself is shown in Appendix I.

Before commenting on the showing of this comparison we should probably briefly explain the derivation of our clearings index.

#### DERIVATION OF CLEARINGS INDEX

The gross clearings were taken monthly to the nearest \$100,000.00. Other investigations having found that the Cost of Living Indices of the U. S. Bureau of Labor were suitable for deflating such series, we first interpolated these indices for monthly values and divided the bank clearings by the index. This had the effect of reducing to the 1914 level.

We next took a more extensive set of clearings data annually from 1918 through 1924 inclusive to cover practically the period of a cycle and yet avoid war finance as far as possible and after deflating these fitted a straight line trend by the method of least squares. This gave us the equation

$$Y = 396.9 + 5.85 X$$

where clearings ( $Y$ ) are expressed in millions, time ( $X$ ) in months, and the origin is mid January 1918.

The seasonal correction is by the method of monthly means.

We have applied to the resultant figure a three months' moving average to smooth it similarly to our accident data.

## COMPARISON WITH CLEARINGS INDEX

The visible comparison is shown in Chart III.

We have computed a formal coefficient of correlation by Pearson's method and find it .562 which is significant but not high. We believe the actual relationship is closer than such a coefficient indicates. We have not tested it out for different periods of lag as the lag appears different at different periods of the cycle. We think we should expect the accident rates to lead on the downward swings because with the first recession employees dropped from the payroll are the less competent, those so constituted psychologically as to be most subject to accident. On the pick up we would expect the accident rate to follow, as it is not until the pressure has markedly increased from the low point that the employer feels compelled to again take on such help. Were we to break the series in two parts and lag them in opposite directions the coefficient of correlation would obviously be much higher.

The peak in 1921 we attribute to the revival of building activity, it being generally understood that the sudden revival of dormant industries or opening of new ones generally produces a temporary spurt in the accident rate.

While we feel reasonably sure the relations we have established will be found in the main to be duplicated elsewhere, we prefer for the present to defer discussion of their significance for rate making. We do feel ready to say that we doubt whether any index series can be found which forecasts so far in advance as to permit rates to be adjusted to the cyclic changes, though it may be possible to adapt underwriting practice.

If cyclic variation in accident rates is established its significance in connection with the length of the experience period and other features of the experience rating plan also should not be overlooked.

We are convinced that any flaws there may be in our technique are not responsible for the relationships found. We feel our results justify us in urging that other carriers undertake similar studies for we believe that even though the conditions of their records may require more effort to obtain dependable results than in our case, the value of establishing or disproving such relations as we think we have found is well worth the cost.



## ACKNOWLEDGMENT

In closing we desire to acknowledge our indebtedness to Mr. W. N. Wilson, Fellow of this Society and Statistician of the California State Fund who participated in discussion of plans for this investigation and materially assisted in carrying out many details.

## APPENDIX A

Calendar year	Initial and deposit premiums	Additional premiums on periodical adjustments	Additional premiums on final adjustments
1918 1st Quarter....		196,774	97,175
1918 2nd Quarter...		297,806	73,661
1918 3rd Quarter....		340,777	69,008
1918 4th Quarter....		373,455	102,786
Total.....	907,645	1,208,812	342,630
1919 1st Quarter....		228,005	124,014
1919 2nd Quarter...		399,562	155,503
1919 3rd Quarter....		372,034	136,014
1919 4th Quarter....		534,214	161,826
Total.....	1,140,802	1,533,815	577,357
1920 1st Quarter....		287,278	188,229
1920 2nd Quarter...		586,843	266,737
1920 3rd Quarter....		621,967	266,557
1920 4th Quarter....		624,540	242,876
Total.....	1,332,714	2,120,628	964,399
1921 1st Quarter....		624,378	321,650
1921 2nd Quarter...		549,212	258,453
1921 3rd Quarter....		571,425	244,897
1921 4th Quarter....		620,915	241,467
Total.....	1,555,719	2,365,930	1,066,467
1922 1st Quarter....		352,688	181,688
1922 2nd Quarter...		468,706	220,567
1922 3rd Quarter....		580,541	248,803
1922 4th Quarter....		643,167	250,120
Total.....	1,704,245	2,045,102	901,178
1923 1st Quarter....		580,455	299,022
1923 2nd Quarter...		626,669	294,903
1923 3rd Quarter....		731,424	313,468
1923 4th Quarter....		709,840	276,049
1924 1st Quarter....		717,111	369,421

APPENDIX B  
CALENDAR YEAR EARNED PREMIUMS

	1918	1919	1920	1921	1922
Initial and Deposit premiums Unearned at end of year.....	907,645	1,140,802	1,332,714	1,555,719	1,704,245
	334,893	458,924	516,289	634,138	635,720
Balance.....	572,752	681,878	816,425	921,581	1,068,525
Unearned at beginning of year.	234,176	334,893	458,924	516,289	634,138
Total.....	806,928	1,016,771	1,275,349	1,437,870	1,702,663
Additional premiums on periodical adj.....	1,290,921	1,686,728	2,438,913	2,053,987	2,351,850
on final adj.....	513,146	867,621	1,059,033	913,706	1,142,495
Total calendar year earned premiums.....	2,610,995	3,571,120	4,773,295	4,405,563	5,197,008

APPENDIX C

Year of Issue	Schedule Z average rate	2 year moving average
1917	1.49	
1918	1.71	1.60
1919	1.67	1.69
1920	1.54	1.60
1921	1.49	1.51
1922	1.52	1.50

APPENDIX D

	1918	1919	1920	1921	1922
Premiums .....	2,610,995	3,571,120	4,773,295	4,405,563	5,197,008
Average rate.....	1.60	1.69	1.60	1.51	1.50
Payrolls.....	163,187,187	211,308,875	298,330,937	291,759,139	346,467,200

APPENDIX E

MONTHLY PAYROLLS FOR CALENDAR YEARS 1918-1922

Months	1918		1919		1920		1921		1922	
	Seasonal index	Payroll	Seasonal index	Payroll	Seasonal index	Payroll	Seasonal index	Payroll	Seasonal index	Payroll
January	95.58	12,997,859	95.58	16,830,752	97.09	24,137,458	98.60	23,972,876	87.70	25,320,977
February	91.00	12,375,028	91.00	16,024,256	94.00	23,369,256	97.01	23,586,295	85.95	24,815,713
March	92.33	12,555,894	92.33	16,258,457	95.27	23,684,990	98.20	23,875,623	98.48	28,433,408
April	95.68	13,011,458	95.68	16,848,361	98.04	24,373,637	100.40	24,410,515	102.09	29,475,696
May	99.18	13,487,421	99.18	17,464,679	99.23	24,669,482	99.29	24,140,638	108.06	31,199,371
June	102.21	13,899,468	102.21	17,998,234	100.68	25,029,965	99.14	24,104,168	108.34	31,280,213
July	111.89	15,215,845	111.89	19,702,792	106.38	26,447,037	100.87	24,524,787	106.73	30,815,369
August	114.61	15,585,736	114.61	20,181,759	112.47	27,961,067	110.33	26,824,822	108.16	31,228,243
September	112.49	15,297,439	112.49	19,808,446	110.31	27,424,071	108.13	26,289,930	108.02	31,187,822
October	100.55	13,673,726	100.55	17,705,923	101.50	25,233,826	102.44	24,906,507	97.17	28,055,180
November	92.51	12,580,372	92.51	16,290,153	94.11	23,396,603	95.72	23,272,654	95.75	27,645,195
December	91.97	12,506,938	91.97	16,195,064	90.92	22,603,540	89.87	21,850,329	93.55	27,010,005
Totals	1200.00	163,187,184	1200.00	211,308,876	1200.00	298,330,932	1200.00	291,759,144	1200.00	346,467,192

APPENDIX F  
NUMBER OF ACCIDENTS BY MONTHS OF OCCURRENCE

1918	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
All accidents..	1439	1381	1506	1759	1785	2137	2296	2688	2136	2137	1807	1784	22855
Deaths.....	6	9	7	15	17	10	11	6	7	12	15	7	122
Major perms. . .	14	14	10	13	12	16	13	9	17	18	20	12	168
Minor perms. . .	6	6	19	13	10	14	23	18	29	14	16	20	188
Total serious..	26	29	36	41	39	40	47	33	53	44	51	39	478

1919	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
All accidents..	1916	1751	2341	2410	2609	2540	2546	2739	2727	2730	2235	2691	29235
Deaths.....	10	6	2	15	12	12	6	11	14	8	2	10	108
Major perms. . .	25	16	9	18	22	26	26	19	20	16	20	23	240
Minor perms. . .	23	20	17	8	38	30	26	30	25	37	24	23	301
Total serious...	58	42	28	41	72	68	58	60	59	61	46	56	649

1920	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
All accidents..	2962	2242	2545	3153	2821	3150	3185	3174	3512	3470	2547	2890	35651
Deaths.....	10	7	11	15	12	11	11	10	15	15	13	6	136
Major perms. . .	15	14	15	30	24	29	25	22	25	22	19	14	254
Minor perms. . .	35	30	33	25	25	32	29	42	40	31	31	22	375
Total serious...	60	51	59	70	61	72	65	74	80	68	63	42	765

APPENDIX F—Continued  
 NUMBER OF ACCIDENTS BY MONTHS OF OCCURRENCE

1921	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
All accidents..	2426	2341	2845	2936	3015	3192	2958	3365	3124	3133	2871	2883	35089
Deaths.....	9	8	12	10	11	11	10	14	11	12	14	11	133
Major perms. ..	22	18	19	18	16	25	31	26	16	18	16	19	244
Minor perms. ..	22	19	28	23	29	33	41	27	30	29	25	28	334
Total serious...	53	45	59	51	56	69	82	67	57	59	55	58	711

1922	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
All accidents..	2841	2339	2932	2945	3546	3846	3869	4426	3929	4454	3916	3584	42627
Deaths.....	11	17	9	10	7	14	12	61	12	9	17	13	192
Major perms. ..	23	14	17	23	20	23	25	19	22	27	20	25	258
Minor perms. ..	25	33	35	33	28	34	46	41	37	41	33	43	429
Total serious...	59	64	61	66	55	71	83	121	71	77	70	81	879

## APPENDIX G—PART I

## ALL ACCIDENT RATES PER \$100,000 PAYROLL

Month	1918	1919	1920	1921	1922
January.....	11.071	11.384	12.271	10.120	11.220
February.....	11.160	10.927	9.594	9.925	9.425
March.....	11.994	14.399	10.745	11.916	10.312
April.....	13.519	14.304	12.939	12.028	9.991
May.....	13.234	14.939	11.435	12.489	11.366
June.....	15.375	14.112	12.585	13.243	12.295
July.....	15.090	12.922	12.043	12.061	12.555
August.....	17.246	13.572	11.351	12.544	14.173
September.....	13.963	13.767	12.806	11.883	12.593
October.....	15.629	15.419	13.751	12.519	15.876
November.....	14.364	13.720	10.886	12.336	14.165
December.....	14.264	16.616	12.786	13.194	13.269

## APPENDIX G—PART II

## SERIOUS ACCIDENT RATES PER \$10,000,000 PAYROLL

Month	1918	1919	1920	1921	1922
January.....	20.00	34.46	24.86	22.11	23.30
February.....	23.43	26.21	21.82	19.08	25.79
March.....	28.67	17.22	24.91	24.71	21.45
April.....	31.51	24.33	23.72	20.89	22.39
May.....	28.92	41.23	24.73	23.20	17.63
June.....	28.78	37.78	28.77	28.63	22.69
July.....	30.89	29.44	24.58	33.44	26.93
August.....	21.17	29.73	26.47	24.98	38.75
September.....	34.65	29.79	29.17	21.68	22.77
October.....	32.18	34.45	26.95	23.69	27.45
November.....	40.54	28.24	26.93	23.63	25.22
December.....	31.18	34.58	18.58	26.54	29.99

APPENDIX H—PART I  
CYCLES IN "ALL ACCIDENT" RATES PER \$100,000 OF PAYROLL

Year and month 1	Accident rate 2	Ratio to average 3	Seasonal index 4	(3) - (4) Index of cyclic and unac- counted for variation	3 months moving average
<b>1918</b>					
January.....	11.071	0.865	.876	- 1.1	
February.....	11.160	0.872	.798	7.4	2.4
March.....	11.994	.937	.928	.9	5.3
April.....	13.519	1.057	.981	7.6	4.2
May.....	13.234	1.034	.992	4.2	8.8
June.....	15.375	1.202	1.057	14.5	11.8
July.....	15.090	1.179	1.011	16.8	19.5
August.....	17.246	1.348	1.076	27.2	17.2
September.....	13.963	1.091	1.016	7.5	14.1
October.....	15.629	1.221	1.144	7.7	8.4
November.....	14.364	1.123	1.023	10.0	6.5
December.....	14.264	1.115	1.096	1.9	4.4
<b>1919</b>					
January.....	11.384	.890	.876	1.4	3.0
February.....	10.927	.854	.798	5.6	8.9
March.....	14.399	1.125	.928	19.7	13.0
April.....	14.304	1.118	.981	13.7	17.0
May.....	14.939	1.168	.992	17.6	12.0
June.....	14.112	1.103	1.057	4.6	7.4
July.....	12.922	1.010	1.011	- 1.1	1.0
August.....	13.572	1.061	1.076	- 1.5	1.5
September.....	13.767	1.076	1.016	6.0	3.5
October.....	15.419	1.205	1.144	6.1	5.7
November.....	13.720	1.072	1.023	4.9	10.4
December.....	16.616	1.299	1.096	20.3	11.2
<b>1920</b>					
January.....	12.271	.959	.876	8.3	7.9
February.....	9.594	.750	.798	- 4.8	- 1.8
March.....	10.745	.840	.928	- 8.8	- 3.5
April.....	12.939	1.011	.981	- 3.0	- 5.2
May.....	11.435	.894	.992	- 9.8	- 4.7
June.....	12.585	.984	1.057	- 7.3	- 8.0
July.....	12.043	.941	1.011	- 7.0	-11.1
August.....	11.351	.887	1.076	-18.9	- 9.1
September.....	12.806	1.001	1.016	- 1.5	- 9.1
October.....	13.751	1.075	1.144	- 6.9	- 8.5
November.....	10.886	.851	1.023	-17.2	-11.3
December.....	12.786	.999	1.096	- 9.7	-11.8
<b>1921</b>					
January.....	10.120	.791	.876	- 8.5	- 6.8
February.....	9.925	.776	.798	- 2.2	- 3.5
March.....	11.916	.931	.928	.3	- 2.0
April.....	12.028	.940	.981	- 4.1	- 1.8
May.....	12.489	.976	.992	- 1.6	- 2.6
June.....	13.243	1.035	1.057	- 2.2	- 3.5
July.....	12.061	.943	1.011	- 6.8	- 6.2
August.....	12.544	.980	1.076	- 9.6	- 8.7
September.....	11.883	.929	1.016	- 8.7	-11.6
October.....	12.519	.978	1.144	-16.6	-10.4
November.....	12.336	.964	1.023	- 5.9	- 9.6
December.....	13.194	1.031	1.096	- 6.5	- 4.1
<b>1922</b>					
January.....	11.220	.877	.876	.1	- 4.2
February.....	9.425	.737	.798	- 6.1	- 6.1
March.....	10.312	.806	.928	-12.2	-12.4
April.....	9.991	.781	.981	-20.0	-14.2
May.....	11.366	.888	.992	-10.4	-13.3
June.....	12.295	.961	1.057	- 9.6	- 7.6
July.....	12.555	.981	1.011	- 3.0	- 3.1
August.....	14.173	1.108	1.076	3.2	- 1.0
September.....	12.592	.985	1.016	- 3.1	3.3

APPENDIX H—PART II  
 CYCLES IN SERIOUS ACCIDENT RATES PER \$10,000,000 OF PAYROLL

Year and month 1	Accident rate 2	2 + 27.047 Ratio to average 3	Seasonal index 4	3 - 4	Five months moving average
1918					
January.....	20.00	.739	.922	-18.3	
February.....	23.43	.866	.860	.6	
March.....	28.67	1.060	.865	19.5	6.0
April.....	31.51	1.165	.945	22.0	9.2
May.....	28.92	1.069	1.008	6.1	10.5
June.....	28.78	1.064	1.084	-2.0	1.4
July.....	30.89	1.142	1.074	6.8	2.2
August.....	21.17	.783	1.043	-26.0	3.3
September.....	34.65	1.281	1.022	25.9	12.3
October.....	32.18	1.190	1.070	12.0	13.2
November.....	40.54	1.499	1.069	43.0	25.4
December.....	31.18	1.153	1.043	11.0	22.4
1919					
January.....	34.46	1.274	.922	35.2	15.5
February.....	26.21	.969	.860	10.9	6.0
March.....	17.22	.637	.865	-22.8	14.1
April.....	24.33	.900	.945	-4.5	13.3
May.....	41.23	1.524	1.008	51.6	11.2
June.....	37.78	1.397	1.084	31.3	17.1
July.....	29.44	1.088	1.074	1.4	19.6
August.....	29.73	1.099	1.043	5.6	13.3
September.....	29.79	1.101	1.022	7.9	6.6
October.....	34.45	1.274	1.070	20.4	11.0
November.....	28.24	1.044	1.069	-2.5	9.8
December.....	34.58	1.279	1.043	23.6	7.2
1920					
January.....	24.86	.919	.922	-3	4.2
February.....	21.82	.807	.860	-5.3	7.1
March.....	24.91	.921	.865	5.6	.4
April.....	28.72	1.062	.945	11.7	.1
May.....	24.73	.914	1.008	-9.4	-2.1
June.....	28.77	1.064	1.084	-2.0	-4.5
July.....	24.58	.909	1.074	-16.5	-5.7
August.....	26.47	.979	1.043	-6.4	-5.3
September.....	29.17	1.078	1.022	5.6	-6.4
October.....	26.95	.996	1.070	-7.4	-10.2
November.....	26.93	.996	1.069	-7.3	-11.0
December.....	18.58	.687	1.043	-35.6	-15.3
1921					
January.....	22.11	.817	.922	-10.5	-12.8
February.....	19.08	.705	.860	-15.5	-14.8
March.....	24.71	.914	.865	4.9	-10.7
April.....	20.89	.772	.945	-17.3	-9.1
May.....	23.20	.858	1.008	-15.0	-2.7
June.....	28.63	1.059	1.084	-2.5	-6.1
July.....	33.44	1.236	1.074	16.2	-7.1
August.....	24.98	.924	1.043	-11.9	-7.9
September.....	21.68	.802	1.022	-22.0	-11.3
October.....	23.69	.876	1.070	-19.4	-15.8
November.....	23.63	.874	1.069	-19.5	-14.6
December.....	26.54	.981	1.043	-6.2	-8.4
1922					
January.....	23.30	.861	.922	-6.1	-5.9
February.....	25.79	.954	.860	9.4	-4.4
March.....	21.45	.793	.865	-7.2	-10.2
April.....	22.39	.828	.945	-11.7	-13.9
May.....	17.63	.652	1.008	-35.6	-17.4
June.....	22.69	.839	1.084	-24.5	-8.1
July.....	26.93	.996	1.074	-7.8	-9.4
August.....	38.75	1.433	1.043	39.0	-3.4
September.....	22.77	.842	1.022	-18.0	-1.2
October.....	27.45	1.015	1.070	-5.5	1.7



APPENDIX I  
CYCLES OF CALIFORNIA BANK CLEARINGS

Year and month	Clearings deflated 00,000 omitted	Trend value	Ratio actual to trend	Seasonal	Cycle	3 months moving average of cycle
1918						
January . . . . .	\$471.6	\$396.9	118.8	105.6	13.2	
February . . . . .	386.0	402.8	95.8	86.0	9.8	9.6
March . . . . .	442.0	408.6	108.2	102.5	5.7	7.8
April . . . . .	432.1	414.5	104.2	96.3	7.9	7.5
May . . . . .	451.1	420.3	107.3	98.3	9.0	7.4
June . . . . .	438.8	426.2	103.0	98.2	5.2	9.0
July . . . . .	489.9	432.0	113.4	100.6	12.8	8.4
August . . . . .	455.5	437.9	104.0	96.8	7.2	5.0
September . . . . .	418.7	443.7	94.4	99.5	- 5.1	2.2
October . . . . .	503.9	449.6	112.1	107.7	- 4.4	- 0.6
November . . . . .	456.4	455.4	100.2	101.3	- 1.1	0.1
December . . . . .	480.1	461.2	104.1	107.2	- 3.1	- 0.6
1919						
January . . . . .	504.6	467.1	108.0	105.6	2.4	- 0.3
February . . . . .	406.3	473.0	85.9	86.0	- 0.1	- 0.8
March . . . . .	468.7	478.8	97.9	102.5	- 4.6	- 2.7
April . . . . .	448.6	484.7	92.6	96.3	- 3.7	- 1.7
May . . . . .	497.6	490.5	101.4	98.3	3.1	- 0.5
June . . . . .	483.1	496.4	97.3	98.2	- 0.9	3.3
July . . . . .	544.2	502.2	108.4	100.6	7.8	4.4
August . . . . .	524.2	508.1	103.2	96.8	6.4	6.8
September . . . . .	543.2	513.9	105.7	99.5	6.2	6.1
October . . . . .	589.5	519.8	113.4	107.7	5.7	5.2
November . . . . .	551.3	525.6	104.9	101.3	3.6	5.7
December . . . . .	611.0	531.5	115.0	107.2	7.8	5.7
1920						
January . . . . .	597.8	537.3	111.3	105.6	5.7	6.0
February . . . . .	491.1	543.2	90.4	86.0	4.4	4.9
March . . . . .	588.6	549.0	107.2	102.5	4.7	7.1
April . . . . .	546.9	554.9	108.6	96.3	12.3	4.8
May . . . . .	536.1	560.7	95.6	98.3	- 2.7	3.7
June . . . . .	565.4	566.6	99.8	98.2	- 1.6	- 0.8
July . . . . .	568.4	572.4	99.3	100.6	- 1.3	- 1.7
August . . . . .	429.1	578.3	91.5	96.8	- 5.3	- 1.5
September . . . . .	594.0	584.1	101.7	99.5	2.2	- 2.6
October . . . . .	607.7	590.0	103.0	107.7	- 4.7	- 1.6
November . . . . .	589.9	595.8	99.0	101.3	- 2.3	- 4.6
December . . . . .	604.5	601.7	100.5	107.2	- 6.7	- 7.1
1921						
January . . . . .	567.5	607.5	93.4	105.6	-12.2	- 9.4
February . . . . .	469.6	613.4	76.6	86.0	- 9.4	- 9.4
March . . . . .	594.2	619.2	96.0	102.5	- 6.5	- 8.1
April . . . . .	548.7	625.1	87.8	96.3	- 8.5	- 9.7
May . . . . .	530.5	630.9	84.1	98.3	-14.2	-10.8
June . . . . .	564.0	636.8	88.6	98.2	- 9.6	-13.0
July . . . . .	546.6	642.6	85.0	100.6	-15.2	-11.9
August . . . . .	558.0	648.5	86.0	96.8	-10.8	-12.3
September . . . . .	578.9	654.3	88.5	99.5	-11.0	-11.9
October . . . . .	619.7	660.2	93.9	107.7	-13.8	-10.6
November . . . . .	628.0	666.0	94.3	101.3	- 7.0	- 9.5
December . . . . .	668.4	671.9	99.5	107.2	- 7.7	- 8.3
1922						
January . . . . .	646.7	677.0	95.5	105.6	-10.1	- 7.8
February . . . . .	549.3	683.6	80.4	86.0	- 5.6	- 6.9
March . . . . .	672.6	689.4	97.6	102.5	- 4.9	- 4.2
April . . . . .	655.4	695.3	94.3	96.3	- 2.0	- 1.9
May . . . . .	697.8	701.1	99.5	98.3	1.2	- 0.3
June . . . . .	689.6	707.0	97.5	98.2	- 0.7	- 1.4
July . . . . .	683.6	712.8	95.9	100.6	- 4.7	- 1.8
August . . . . .	695.2	718.7	96.7	96.8	- 0.1	- 1.3
September . . . . .	727.3	724.5	100.4	99.5	0.9	0.3
October . . . . .	787.5	730.4	107.8	107.7	0.1	0.4

CHART I

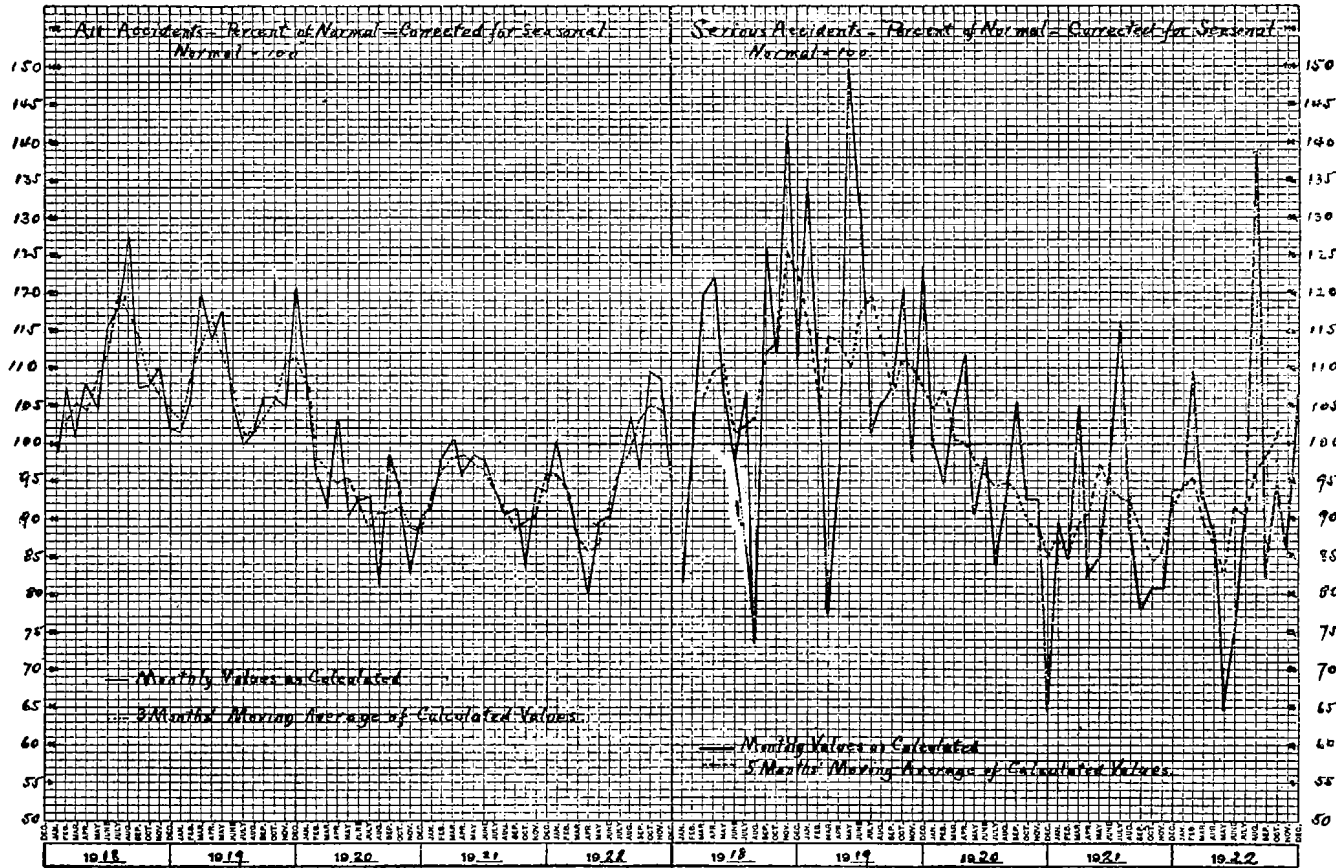
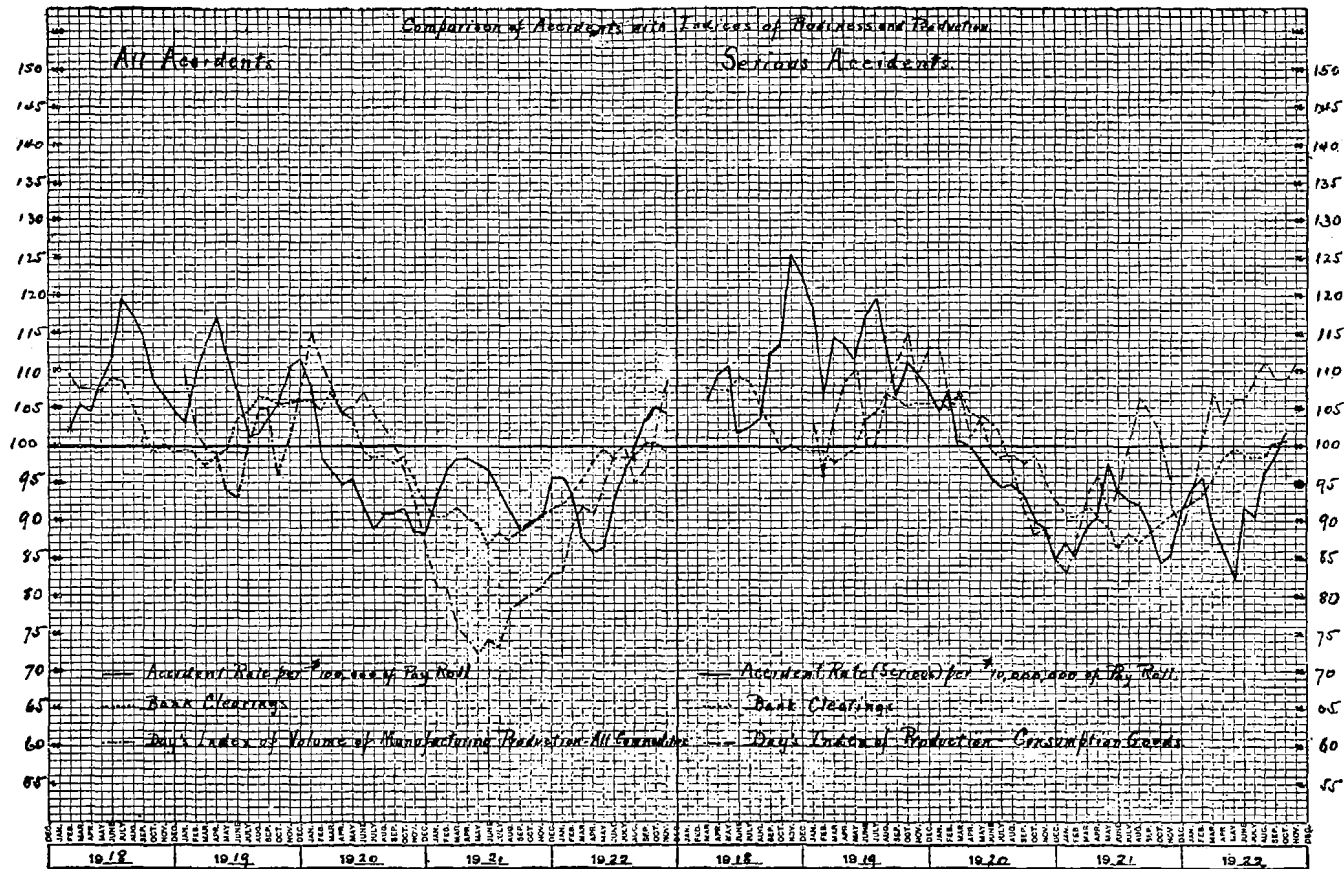
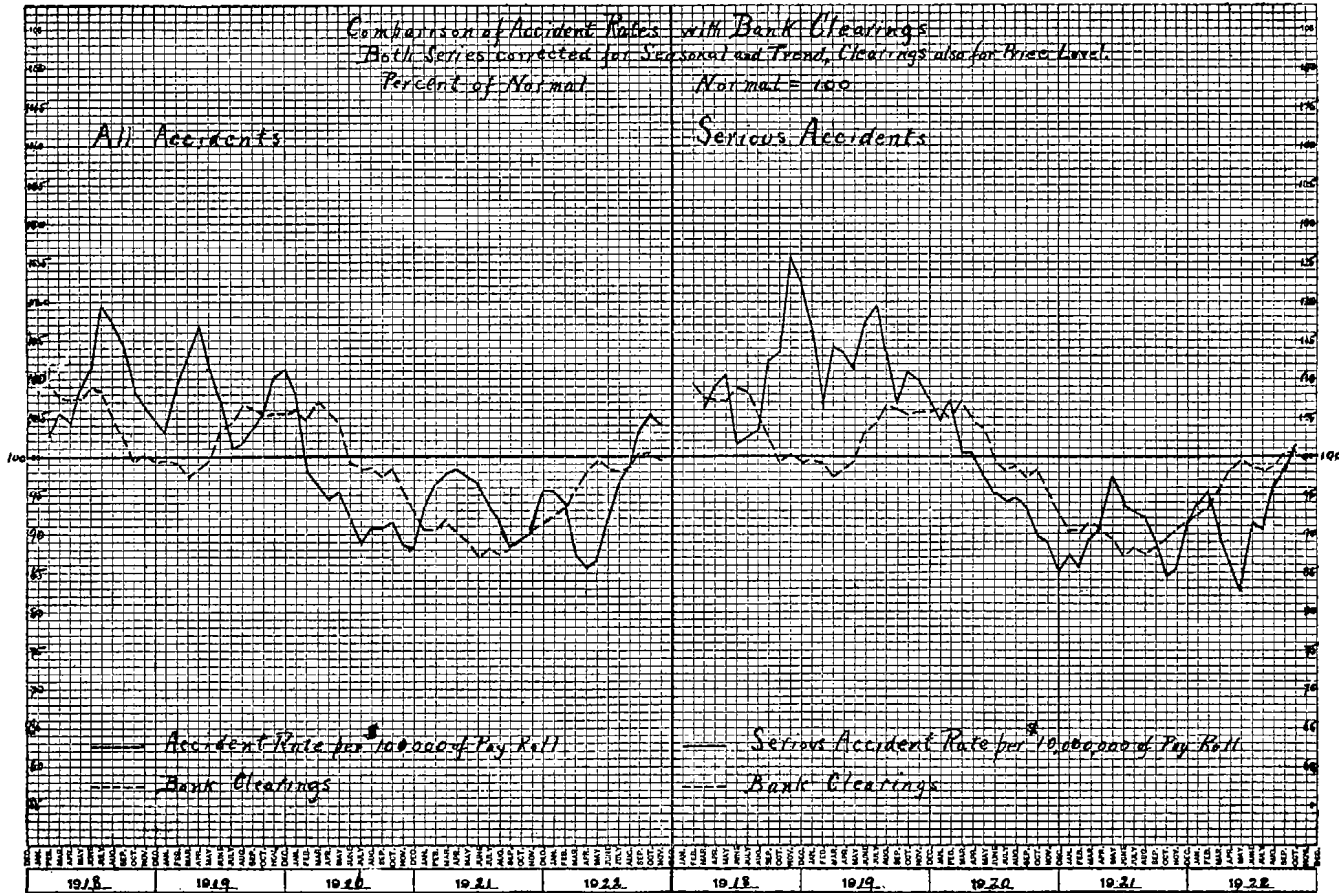


CHART II



### CHART III



STATUTORY REQUIREMENTS FOR CASUALTY  
COMPANIES

BY

THOMAS F. TARBELL

The Examination Syllabus of our Society (Associateship, Part II, Section 5)\* calls for a knowledge, on the part of the student sitting for the Associateship Examinations, of insurance law, including the more important statutes of the United States and Canada (for Canadian candidates) relating to casualty insurance. Attention has recently been called to the dearth of suitable texts covering this section of the syllabus and steps have been taken by our Society to remedy this situation.

As the preparation of a suitable text or texts will take considerable time, the writer has prepared the following rather brief outline of statutory requirements relating to casualty insurance and casualty companies. No attempt has been made to cover all the legal features that a text book on casualty insurance law would embrace but rather to treat in a more or less general way statutory requirements as they affect the relations of casualty insurance companies and state insurance departments.

## VARIETY OF STATE LAWS

Insurance companies of all classes, if transacting a countrywide business, are subject to a greater multiplicity of state laws than any other class of corporation. Legislation is usually enacted in the various states from the point of view of each particular state with the result that there is a lack of uniformity of statutory requirements making it difficult to effectively and efficiently carry on an interstate business. Conditions in this respect are improving and the National Convention of Insurance Commissioners has accomplished much in bringing about a greater degree of uniformity through the sponsoring of uniform bills for enact-

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\*Since this paper was written a change has been made in the Syllabus whereby insurance law is made a part of the Fellowship Examinations (Part I, Section II).

ment by the various state legislatures. The millenium, however, has not yet arrived\*.

#### INFLUENCE OF LIFE AND FIRE AND MARINE INSURANCE LEGISLATION

Casualty insurance is the youngest of the three major branches of insurance and naturally legislation affecting it has been influenced by existing statutes applicable to life and fire and marine insurance. It is easier in legislation, as in other matters, to follow the line of least resistance and this has resulted in the past in subjecting casualty companies to statutes not adapted to the conditions of the business and has in some instances restricted the normal development of the business. For example: Too much attention has been given in the past to maintaining a clear line of demarcation between classes of business that a fire company may write and classes of business that a casualty company may write. A more liberal view of this question is evident at the present time.

#### EFFECT OF CHANGING CONDITIONS

In addition to being the youngest of the major branches of insurance, casualty insurance has been subject to comparatively rapid changes in conditions, particularly the development of new or extended classes of coverage. In the early days of the business, employers' liability and accident and health were the only lines written in any considerable volume. The development of the automobile industry and the rapid spread of workmen's compensation laws together with the extension of corporate surety and fidelity business and its undertaking by general casualty companies, not to mention the increase in importance of the minor lines, produced an era, beginning about fifteen years ago, of rapid growth and constantly changing conditions. This era is still running. Constant changes in compensation laws present new problems; the development of the automobile lines

\*The substitution of federal for state regulation of insurance has been sponsored on several occasions but to date no progress has been made and as the United States Supreme Court has consistently held that insurance is not commerce and consequently not subject to federal control there is little prospect of any relief from this quarter. There is considerable doubt, however, if such a change would bring any relief.

is constantly going on and new coverages are being devised and old coverages extended. The growth of the casualty insurance business in the past fifteen years may be measured roughly by reference to the annual reports of any of the important insurance states. Taking the Connecticut Insurance Reports for instance, we find that in 1909 forty-nine stock, mutual and foreign casualty companies wrote an aggregate country-wide volume of business of \$81,778,191.58; in 1924, seventy-three similar companies wrote an aggregate volume of \$521,669,125.14. The following table, taken from the Connecticut reports, shows the premium volume at five year intervals from 1909 to 1924:

Year	No. of Companies	Premiums Written
1909	49	\$ 81,778,191.58
1914	57	133,782,221.95
1919	60	310,622,591.48
1924	73	521,669,125.14

The above figures are of no value as a measure of the total amount of countrywide business written in the years in question as they are limited to the business of only those companies licensed in Connecticut and further are not an accurate measure of the increase in casualty business during the five and fifteen year periods owing to the fact that the number of companies licensed in Connecticut has constantly increased. They do, however, give a rough indication of the enormous increase in the casualty business during the past fifteen years. Because of the rapid development of the casualty business, legislation, which is always several steps behind existing conditions, has not in many respects kept pace with the business and this fact is quite noticeable in a study of laws governing the operation of casualty companies.

#### INCORPORATION

As the starting point of an insurance company is its incorporation it is desirable to begin with the consideration of the general subject of statutory requirements at this point, particularly because of the relationship between requirements for incorporation of domestic companies and requirements for admission of companies of other states. Unless otherwise specified, all requirements mentioned apply to stock companies.

In the early days of insurance in the United States, companies were incorporated either by special act of the state legislature or under the general corporation laws. With the progress of insurance legislation, special incorporation laws were developed applying specifically to insurance companies. All three methods still prevail although Connecticut and Rhode Island are the only states that provide for incorporation only by special legislative act. In Massachusetts companies are incorporated under the general incorporation laws but must also conform to certain provisions of the insurance laws. In New York, casualty companies are incorporated under the statutes applicable exclusively to insurance companies, subject to certain provisions of the general corporation laws.

The special act method, owing to abuses that existed in years past and also because of its inelasticity due to the fact that incorporations of new companies or changes in the charters of existing companies must wait upon the convening of the legislature, and in most states this body meets but once in two years, is not popular at the present time.

In general the laws relating to the incorporation of stock casualty companies provide that the charter or articles of incorporation must state the following:

1. The names and addresses of the incorporators;
2. The name of the company;
3. The location of the company;
4. The kinds of business to be transacted;
5. The mode in which the corporate powers are to be exercised including provision for directors;
6. The amount of paid in capital;
7. The amount of paid in surplus.

Quotations from certain sections of the New York Insurance Law will perhaps best illustrate some of the provisions mentioned above:

Section 70 of Chapter 28 of the Consolidated Laws which covers the incorporation of both life and casualty companies, provides as follows:

“Thirteen or more persons may become a corporation for the purpose of making any of the following kinds of insurance:

- (1) Upon the lives or the health of persons and every insurance appertaining thereto, and to grant, purchase and dispose of annuities.



(2) Against injury, disablement or death resulting from traveling or general accident, and against disablement resulting from sickness and every insurance appertaining thereto.

(3) Insuring any one (a) against loss or damage resulting from accident to or injury suffered by an employee or other person, and for which the person insured is liable, (b) against loss or damage to property caused by animals or by any vehicle drawn by animal power, and for which loss or damage the person insured is liable, and (c) against any other loss or damage to property and for which the insured is liable, except loss or damage caused by risks or hazards of the kinds mentioned in subdivisions seven, nine, ten and eleven of this section.

(4) Guaranteeing the fidelity of persons holding places of public or private trust. Guaranteeing the performance of contracts other than insurance policies; guaranteeing the performance of insurance contracts where surety bonds are accepted by states or municipalities; executing or guaranteeing bonds and undertakings required or permitted in all actions or proceedings or by law allowed; and indemnifying banks, bankers, brokers, financial or moneyed associations, or financial or moneyed corporations, against the loss of any bills of exchange, notes, drafts, acceptances of drafts, bonds, securities, evidences of debts, deeds, mortgages, documents, currency and money, except that no such contract or indemnity indemnifying banks, bankers, brokers, financial or moneyed associations, or financial or moneyed corporations, shall indemnify against loss caused by marine risks, or risks of transportation or navigation. A company authorized to do the business mentioned in this subdivision may guarantee any federal land bank against loss by reason of defective title or incumbrances on real property on which any such federal land bank may make a loan secured by a mortgage.

(4a) Guaranteeing and indemnifying merchants, traders and those engaged in business and giving credit from loss and damage by reason of giving and extending credit to their customers and those dealing with them; and corporations authorized to do such last named business in this subdivision mentioned shall have all the powers conferred by section one hundred and seventy-eight of this chapter.

(5) Against loss by burglary, theft, larceny, forgery, vandalism or malicious mischief, the wrongful conversion, disposal, or concealment of automobiles held under a conditional sale contract or subject to a chattel mortgage, or any one or more of such hazards. Any corporation authorized to transact business as hereinbefore mentioned in this subdivision if possessed of a capital of at least two hundred thousand dollars, may, by taking the proceedings required in section fifty-two of this chapter, amend its charter so as to include therein the insurance of jewelers

and other persons engaged in the business or trade of manufacturing, buying, selling or dealing in, cutting or setting of precious stones, jewels, jewelry, gold, silver and other precious metals, whether as principals, agents, brokers, factors or otherwise, against any and all risks of loss, damage, injury, deterioration, loss of use or liability arising from or in connection with such business or trade. Such insurance shall be known and designated as 'jewelers' block insurance' and made under a policy upon the face and outside cover of which shall be printed in bold face type the words 'jewelers' block policy.'

(6) Upon glass against breakage.

(7) Against (a) loss or damage to steam boilers and pipes or containers connected therewith, waterheaters and pipes or containers connected therewith, apparatus for heating or lighting buildings or preparing food therein, fly wheels, power wheels and engines or other apparatus for applying or transmitting motive power and machinery connected therewith or operated thereby, caused by explosion thereof or accidental injury thereto; against (b) loss or damage to life or property resulting therefrom, including loss by legal liability resulting from or incurred in connection with claims against the assured because of loss or damage to persons or property caused as aforesaid; and against (c) loss of use and occupancy caused thereby, and to make inspection of and to issue certificates of inspection upon such boilers, pipes, fly wheels, engines and machinery.

(8) Upon the lives of horses, cattle and other live stock or against loss by the theft of any of such property or both.

(9) Against loss or damage to automobiles and airplanes, seaplanes, dirigibles or other aircraft (except loss or damage by fire or while being transported in any conveyance by land or water), and against loss or damage to property caused thereby, including loss by legal liability for damage to property resulting from the maintenance and use of automobiles and airplanes, seaplanes, dirigibles or other aircraft.

(10) Against loss or damage by water or other fluid to any goods or premises, arising from the breakage or leakage of sprinklers, pumps or other apparatus erected for extinguishing fires, or of other conduits or containers, or by casual water entering through leaks or openings in buildings, and of water pipes; against accidental injury to such sprinklers, pumps, fire apparatus, conduits or containers; and against damage from loss of use or occupancy of premises by reason of such causes, or any of them.

(11) Against loss or damage to elevators or other property, excepting loss or damage by fire, caused by the maintenance, operation or use of elevators, and including loss by legal liability for damage to property resulting from such operation, mainte-

nance or use of elevators; by making and filing in the office of the superintendent of insurance a certificate signed by each of them, stating their intention to form a corporation for the purpose or purposes named in some one of the foregoing subdivisions, specifying the subdivisions; and setting forth a copy of the charter which they propose to adopt, which shall state the name of the proposed corporation, the place where its principal office is to be located, the kind of insurance to be undertaken, and under which of the foregoing subdivisions it is authorized, the mode and manner in which its corporate powers are to be exercised, the number of its directors, the manner of electing its directors and officers, a majority of whom shall be citizens and residents of this state, the time of such elections, the names and postoffice addresses of the directors who shall serve until the first annual meeting of such corporation, the manner of filling vacancies, the amount of its capital and such other particulars as may be necessary to explain and make manifest the objects and purposes of the corporation.

Such certificates shall be proved or acknowledged and recorded in a book to be kept for that purpose, and a certified copy thereof delivered to the persons executing the same. Except as herein provided, no corporation shall be formed under this article for the purpose of undertaking any other kind of insurance than that specified in some one of the foregoing subdivisions, or more kinds of insurance than are specified in a single subdivision; but a corporation may be formed for all the purposes combined, or any two or more of them specified in the first and second subdivisions, and clause (a) of the third subdivision, or for all the purposes combined, or any two or more of them specified in the second, third, fourth, fourth-a, fifth, sixth, seventh, eighth, ninth, tenth and eleventh subdivisions. No one policy issued by any one corporation shall embrace the kinds of insurance that are specified in subdivision four with the kind of insurance specified in any other subdivision of this section."

From a consideration of the second paragraph of sub-section 11 it will be noted that, as respects classes of business that may be written, there is an overlapping of the powers granted to life and casualty companies. Both companies may write accident and health insurance and all forms of liability for loss or damage as the result of personal injury (employers, public, automobile, etc., liability and compensation).

While a considerable number of life companies have taken advantage of the privilege of writing accident and health insurance, only two of the larger companies, the Aetna Life Insurance Company and The Travelers Insurance Company, have availed

themselves of the authority to write the liability lines, and it is interesting to note that these two companies maintain a complete segregation of assets as between the life and the casualty business.

The section above quoted is one of the best examples of an up to date and comprehensive law defining the classes of business that a casualty company may write. Its up-to-dateness is evidenced by the 1925 amendment to sub-section 5 permitting the writing of "jewelers' block insurance."\*

The shortcoming of the New York law and of the laws of many other states is its inelasticity. With conditions constantly changing and demands arising for new forms of coverage, a law that attempts to specifically enumerate the lines of business that a company may write is inadequate. This situation has long been realized and has been partially remedied. At the annual meeting of the National Convention of Insurance Commissioners in 1920, one of our fellow members, Honorable Clarence W. Hobbs, at that time Insurance Commissioner of Massachusetts, offered the following resolution which was adopted:

†"Resolved, That the Committee on Laws and Legislation consider and report upon the expediency of a uniform classification of insurance companies; also upon the expediency of a uniform method of authorizing the transaction of new lines of insurance under departmental license."

At the December, 1922, meeting of the National Convention, the Committee on Laws and Legislation presented the following resolution which was adopted:

"Resolved, That the Commissioners be requested to procure the enactment of the following legislation in their several States, viz.:

"An act to authorize the transaction of classes of insurance not specifically authorized by law.

Be it enacted, etc.—

Section 1.—An insurance company authorized to transact within the State any of the classes of insurance set forth in the

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\*This line however, probably will not be pushed to any great extent by casualty companies as a majority of the hazards insured against are those usually covered by marine companies who are at present better equipped to handle loss adjustments.

†*Proceedings* of the National Convention of Insurance Commissioners, 1920, Page 137.

laws relating to the powers of insurance companies may transact in addition thereto any form of insurance not specifically included in such laws, provided that such form of insurance is not contrary to public policy or prohibited by statute. Such additional forms shall be transacted only upon express license of the Insurance Commissioner, and upon such terms and conditions as he may from time to time prescribe."

The suggested uniform statute or a similar statute has been enacted in at least eleven\* states, but has not been sponsored as enthusiastically as its importance justifies.

It is appropriate to mention at this point that during the past few years there has been considerable agitation over the matter of multiple line insurance, in fact the National Convention of Insurance Commissioners has wrestled with the problem since 1919. The American system of single line companies appears to be too deeply rooted to be upset at present or in the near future. However, some progress has been made as is evidenced by the recent amendments to the New York statutes permitting the writing of jewelers' block (all risks) insurance by either casualty, fire and marine, or marine companies. The next step in the direction of multiple lines will undoubtedly be the more general adoption of statutes permitting a single company to write all classes of automobile coverage. This authority is at present granted by more than one-half the †states but has not been authorized to any extent in the Eastern states and accordingly has not been undertaken by any of the larger general casualty companies.

To return to the subject of classes of coverage authorized by statute, an examination of similar statutes of other states discloses that in general the classes follow those specified by the New York law but in most instances are less comprehensive‡. In the case of Massachusetts and certain other states a single section (Section 47, Chapter 185, General Laws) enumerates the classes of business that companies in general may be incorporated for but the following section limits the various combinations that

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\*Arizona, Arkansas, California, District of Columbia, Kansas, Louisiana, Massachusetts, Texas, Utah, Vermont and Washington.

†In some states such authority is granted only to companies restricting their business to automobile insurance only.

‡The Iowa statutes do not permit a life company to write automobile liability insurance.

may be made, which, so far as casualty insurance is concerned, are substantially the same as in the New York statutes.

The minimum number of incorporators varies; the New York law specifies thirteen, the Massachusetts law ten. There is usually no restriction as to the maximum number. In general the law specifies certain qualifications for incorporators. In New York the General Corporation Law (Section 4) provides as follows:

“A certificate of incorporation must be personally executed by natural persons of full age, at least two-thirds of whom must be citizens of the United States and one a resident of this State.”

The Massachusetts statute (Section 48, Chapter 175) provides that the incorporators must be “Residents of this Commonwealth.”

The name of the company is a matter that has generally received rather careful consideration by the law makers. Statutes bearing upon this matter usually have a two-fold purpose; first to insure that the name adopted by the company will clearly indicate the nature or character of its business and second that the business of an established company will not be injured by an infringement on its good name.\*

The Massachusetts statutes cover both of the above points. Section 49, Chapter 175, of the General Laws provides in part as follows:

“The name of the Corporation shall be subject to approval by the †Commissioner and shall contain the word ‘Insurance’.”

Section 9, Chapter 155 of the General Laws provides in part as follows:

“A corporation . . . shall not assume the name of another corporation established under the laws of the Commonwealth, or of a corporation, firm, association or person carrying on business in the Commonwealth, at the time of such organization or within three years prior thereto or assume a name so similar thereto as to be likely to be mistaken for it, except with the written consent of said existing corporation, firm or association or of such person previously filed with the †Commissioner.”

\*Statutory provisions for the protection of corporate names have been found essential for the protection of insurance companies as well as of corporations in nearly every other line of business, and have received favorable attention by the federal authorities and in state laws under the so-called “Unfair Trade Practices” acts.

†Commissioner of Corporations and Taxation.

The New York law (Section 10, Chapter 28) contains the following:

"No certificate of authority to transact the business of insurance in this state, shall be granted by the Superintendent of Insurance to any insurance corporation hereafter applying therefor, if such corporation has the same name as another corporation authorized to transact such business in this state at the time of granting such certificate, or a name so nearly resembling it as to be calculated to deceive."

As a rule the various state laws require that a domestic corporation must have its principal office of business in the state and must maintain there certain records, and as a rule companies have their general business offices in the home state. There are, however, a number of exceptions in case of insurance companies. A company may incorporate in a state other than that in which it intends to maintain its general office because of certain advantages in the matter of taxation or for other reasons. Again the general offices of an established company may be transferred to a foreign state as a result of change of control or because of business considerations affecting the efficient and economical transaction of its business\*.

The kinds of business to be transacted are required to be stated in detail, first because it is a fundamental of corporation law that the charter or articles of incorporation must state the nature of the business or businesses to be transacted and second because in the United States, as previously pointed out, the legislative policy has been to draw a rather sharp distinction between the kinds of coverage that the various classes of companies may grant.

The corporate powers of a company are exercised through a board of directors and officials elected by the directors. The by-laws govern the number and method of electing directors and officers including the filling of vacancies. The by-laws must, of course, contain nothing inconsistent with the statutory law. The minimum number of directors is usually specified in the statutes and, like the number of incorporators, varies. In Massachusetts the minimum number is five and in New York, thirteen. The

\*The maintenance of a "Principal Office" in the home state by a company with its general office in another state does not as a rule cause any great inconvenience as such a company will usually maintain a branch office or general agency in one of the larger cities of the home state.

law usually requires that the directors must be stockholders and in some cases specifies the minimum number of shares that a director must hold. It is also required by statute in many states that a majority of the directors must be citizens of the home state. The requirement that directors be stockholders is based upon the theory that those charged with the duty or accepting the honor of serving as directors will have a greater interest in the company's affairs if they are likewise stockholders. The Massachusetts law does not require that directors be stockholders.

The law imposes certain duties upon directors and holds them, jointly with the officers, accountable for the proper administration of the company's business. In some states the specific responsibilities are rather stringent. In Massachusetts, for example (Section 62, Chapter 175), the law provides that the directors or other officers of a company making or authorizing an investment or loan in violation of the statutes concerning such investments or loans shall be personally liable to the stockholders for any loss caused thereby; if they allow to be insured on a single risk a larger amount than authorized by statute (10% of net assets) they shall be personally liable for any loss in excess of the amounts to which they might lawfully insure; if they make or assent to further insurance, knowing that the accrued losses of the company equal its net assets, they shall be personally liable for any loss under such insurance.

The laws of most states prohibit any officer or director from receiving any benefit in commission, fees, brokerage or other pecuniary benefit in connection with investments, loans, sale or purchase of property, etc., engaged in by the company. This matter is covered in Section 36, Chapter 28, of the New York law. Probably the most inclusive statute of this nature is to be found in the Massachusetts law, Section 64, Chapter 175, which reads as follows:

"All investments and deposits of the funds of any such company shall be made in its corporate name and no director or other officer thereof, and no member of a committee having any authority in the investment or disposition of its funds, shall accept, of be the beneficiary, either directly or remotely, of any fee, brokerage, commission, gift or other consideration for or on account or any loan, deposit, purchase, sale, payment or exchange made by or in behalf of such company, or be pecuniarily interested in any such purchase, sale or loan, either as borrower, principal, co-



principal, agent or beneficiary, except that if a policyholder, he shall be entitled to all the benefits accruing under the terms of his contract."

### CAPITAL REQUIREMENTS

There is a decided lack of uniformity in the capital stock requirements of the laws of the various states. In some states no distinction is made as respects lines of business transacted while in others capital requirements vary according to the line or lines of business to be transacted. In general the minimum capital required is \$100,000 but with a few exceptions this minimum would not permit a company to transact more than a single line such as accident and health, plate glass, burglary, liability and compensation, etc. In about one-third of the states, at least \$200,000 capital is required to qualify for liability and compensation and in more than one-half the states at least \$250,000 capital to qualify for fidelity and surety\*. In New York the law as respects capitalization has been developed on the plan of establishing a minimum capital requirement for a single line and a specific amount of additional capital for each additional line and this plan is also incorporated with variations and exceptions in the laws of a considerable number of states, including California, Louisiana, Massachusetts, Nebraska, New Jersey, Pennsylvania, Tennessee, Texas, Utah, Washington and Wisconsin.

Section 70 of Chapter 28, of the New York laws, which covers the incorporation of both life and casualty companies enumerates eleven kinds of insurance for which companies may be incorporated. For specific details and descriptions of coverages this †section should be studied. It will be sufficient to give here the lines provided for as they are commonly known or described in the Convention Annual Statement blank.

1. Life (including annuities) and health
2. Accident and health
3.
  - (a) Liability for personal injury or death
  - (b) Teams (including animal)
  - (c) Property damage, other than steam boiler, engine and machinery, automobile, sprinkler, water and elevator

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\*West Virginia requires \$600,000.

†See quotation from this law under "Incorporation", the preceding heading in the text of this paper.

4. Fidelity and surety
4. (a) Credit
5. Burglary (including "jewelers' block")
6. Glass
7. Steam boiler, engine and machinery
8. Live stock
9. Automobile and aircraft property damage and collision
10. Sprinkler and water damage
11. Elevator property damage and collision.

The permissible combinations of kinds and minimum and maximum capital requirements are covered in Section 12 of the same chapter. The second paragraph applying to life and casualty companies provides as follows:

"No domestic stock insurance corporation shall be hereafter authorized to transact the kind of insurance business described in subdivision one, two, five, six, seven, eight, nine, ten and eleven of section seventy of this chapter with a smaller capital stock than one hundred thousand dollars fully paid in in cash. No domestic stock insurance corporation shall be hereafter authorized to transact the kind of insurance business described in subdivisions three or four of section seventy of this chapter with a smaller capital stock than two hundred and fifty thousand dollars fully paid in in cash if authorized to transact any kind of insurance business described in one of such subdivisions or a smaller capital stock than five hundred thousand dollars fully paid in in cash if authorized to transact the kinds of insurance business described in both such subdivisions. Except as to requirements of a minimum capital stock for the transaction of the kinds of insurance business described in subdivisions three or four of section seventy of this chapter every domestic stock insurance corporation hereafter authorized having power to transact business under more than one subdivision of such section shall, in addition to the minimum capital stock prescribed in this section, have an additional capital stock of fifty thousand dollars fully paid in in cash, for every kind of insurance business more than one which it is authorized to transact. Any corporation to which this section is applicable shall also at the time of its organization, have a surplus equal to fifty per centum of its capital stock, which surplus shall also be fully paid in in cash; provided that this requirement shall not apply to existing corporations reincorporated."

From the foregoing it will be noted that under the New York law the minimum capital for a single line except liability, fidelity

and surety, \*credit and burglary (if power to write "jewelers' block" is included) is \$100,000 with an additional \$50,000 for each additional line; provided, however, that the minimum for burglary (including jewelers' block) is \$200,000; liability or fidelity and surety \$250,000, or for both liability and fidelity and surety, \$500,000.

A company incorporated to write all lines of business provided for would require a minimum capital of \$950,000 arrived at as follows:

Liability (and other coverages specified in subdivision 3).....	\$250,000	Minimum
Fidelity and surety.....	250,000	"
Accident and health.....	50,000	Additional
Credit.....	50,000	"
Burglary (including or excluding jewelers' block).....	50,000	"
Glass.....	50,000	"
Steam boiler, engine and machinery.....	50,000	"
Live stock.....	50,000	"
Automobile and aircraft property damage and collision.....	50,000	"
Sprinkler and water damage.....	50,000	"
Elevator property damage and collision..	50,000	"
	<hr/>	
Total.....	\$950,000	

The Massachusetts law follows in general the New York law, the minimum capital required for all lines being \$900,000. (For further details see Sections 47, 48 and 51, Chapter 175, General Laws.) The Massachusetts law establishes a minimum for a single line and provides that for a combination of lines the capital required shall be the largest minimum capital for a single line plus one-half the minimum capital established for each additional line.

For the transaction of single lines and certain combinations of lines, there is a considerable difference between the New York and Massachusetts minimum capital requirements as will be noted from the following exhibit:

\*The Department has ruled that a company organized to write credit business only must incorporate under the provisions of Section 170 providing for the incorporation of "Title and Credit Guaranty Corporations" which prescribes a minimum capital of \$250,000.

## CAPITAL REQUIREMENTS

Line or Lines	New York	Massachusetts
Fidelity & surety.....	\$250,000	\$200,000
Credit.....	250,000	200,000
Liability and fidelity and surety.....	500,000	300,000
Liability.....	250,000	200,000
Burglary (including jewelers' block)...	100,000	200,000
Fidelity, surety and burglary.....	550,000	300,000
Steam boiler, engine and machinery...	100,000	200,000
Sprinkler and water damage.....	100,000	200,000

The legislative tendency at the present time is to set up standards of capitalization similar to those of New York and Massachusetts but there is a decided lack of uniformity.

## SURPLUS REQUIREMENTS

The number of states requiring by statute a paid in surplus at organization is rather small. There is also, as in the case of capital requirements, a decided lack of uniformity. New York and Pennsylvania require a paid in cash surplus at organization of 50% of the paid in capital; Wisconsin requires 25% of the capital in case of companies other than surety companies and 50%, (\$125,000) of the minimum capital (\$250,000) in case of surety companies; Virginia, District of Columbia and Oregon specify 50% of the minimum capital; Washington specifies 50% of the minimum capital for some lines (fidelity and surety, liability and automobile) and 25% for other lines (accident, plate glass, burglary, credit, vehicle—other than automobile—and elevator). A few states specify a surplus only in case of companies transacting fidelity and surety business, among which may be mentioned: Idaho, 20% of minimum capital; Minnesota, 25% of minimum capital and Kansas 10% of capital.

The foregoing is not a complete list of states having statutory surplus requirements but is submitted to illustrate the lack of uniformity in the statutes covering the subject.

The matter of ample surplus requirements does not in general appear to have received as much attention and consideration as its importance justifies. The heavy initial expense of commencing business and the stringent unearned premium reserve requirements make heavy demands upon surplus during the early years of a company and an ample surplus fund should be required. Ex-

perience has demonstrated that an initial surplus of 50% is none too large and that 100% would not provide any too great a margin, especially in the case of a company desiring to write a substantial volume in the first few years of its existence.

#### INVESTMENTS—DOMESTIC COMPANIES

The main principle underlying the enactment of statutes regulating investments is to secure a certain measure of soundness and stability and prevent insurance funds from being wasted in speculative and unsound investments. All but two states, Connecticut and Rhode Island, have enacted some form of investment statute. There is practically no uniformity in such statutes. Roughly, investment statutes fall into three general classes, according to their scope, as follows:

1. Statutes prescribing the investment of capital only;
2. Statutes prescribing the investment of capital and a part of remaining funds;
3. Statutes prescribing the investment of all funds.

Within the three general classes there are many variations and the scope of investments ranges from liberality to rather close restriction. In the first class, some states regulate the investments to the amount of minimum capital required while in others the regulation applies to the total capital\*. The second class is not of any great importance. In the third class, which embraces a majority of the states, we find most liberal provisions such as that of Tennessee whose investment law requires that funds must be invested in "good available securities" and rather stringent provisions as exemplified by the laws of Maine and Vermont which restrict investments to those permitted to savings banks.

By and large, however, the investment provisions are not burdensome, a rather wide choice being open to the companies as will be noted from the following list which is a sort of summary of the classes of investments generally approved:

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\*The New York Law (Section 16, Chapter 28) differentiates between investments of minimum capital required and balance of capital, restricting investment of minimum capital to stocks and bonds of the United States or of New York State or the bonds of a county or incorporated city of New York State.

1. Bonds, notes and other evidences of indebtedness of the United States;
2. Bonds, notes and other evidences of indebtedness of the home state or any political sub-division thereof;
3. Bonds, notes and other evidences of indebtedness of any other state of the United States or any political sub-division thereof;
4. Bonds, notes and other evidences of indebtedness of the Dominion of Canada, its provinces or any political sub-division thereof;
5. First mortgages on unencumbered real estate situated in the United States or Canada;
6. Collateral loans upon the foregoing classes of securities;
7. Certain corporate bonds;
8. Certain corporate stocks.

In those states, the statutes of which make a distinction between the investment of capital and other funds, investment of capital is generally restricted to those classes of securities considered to possess the greatest element of security. In most states the investment statutes in addition to prescribing investments also prohibit certain classes of investment.

A majority of states prohibit investment in real estate except such as is necessary for the companies' accommodation in the convenient transaction of its business, and such as it shall have acquired in good faith in settlement of debts or obligations or through foreclosure of mortgage loans, but require that all real estate acquired in the latter manner must be disposed of within a certain period of time, with authority to the Insurance Commissioner to extend such time, if, in his opinion, an extension of time is justified.

Some states prohibit the acquiring and holding of stock in other insurance companies. Of late, however, there has been a tendency to remove this barrier. Prior to 1923 the laws of the State of New York, (Section 16, Chapter 28) prohibited a domestic company from investing any of its funds in the stock of another insurance company carrying on the same kind of business but at the legislative session of that year the law was amended to permit such investment under certain conditions and subject to approval of the Superintendent of Insurance. The law was further amended in 1925. Investing in, or loaning money on security of a company's own stock, is also prohibited in most states.

## IMPAIRMENT OF CAPITAL

With the exceptions of Indiana, all states and the District of Columbia have statutes prescribing the procedure in event of impairment of capital. The statutes are fairly uniform but the degree of impairment permitted before action is taken varies. The course generally prescribed requires that if the capital becomes impaired to a certain degree, the Insurance Commissioner shall notify the company that the impairment must be made good by the stockholders within a certain period, usually thirty, sixty or ninety days, and if such order is not complied with within the time specified, he shall then revoke its authority to further transact business and institute such legal proceedings as are necessary to preserve the assets and wind up the company's affairs. In some states, the supervising official is designated by law as receiver and liquidator. Most states provide that the impairment may be made good by a reduction of capital provided that such reduction does not bring the capital below the minimum specified for incorporation of new companies. The degree of impairment allowed before action is taken varies from "any impairment" to 50% impairment (Maine), the degrees most frequently stipulated being 20% and 25%.

## DEPOSITS OF SECURITIES

Deposits of securities required by law are of two kinds: general deposits and special deposits. General deposits are those required for the benefit of all policyholders (and creditors) of the company. There are two classes of general deposit laws, one requiring a deposit by domestic companies and the other a deposit by companies of other states as a condition precedent to receiving authority to transact business. The latter class of law usually provides that a company may have its general deposit either in its home state or in some other state of the United States so that a company having a general deposit of sufficient amount in its home state will meet the general deposit requirements of all states in which it seeks to transact business. The amount of the general deposit specified by the laws of the various states varies. The minimum amount most generally specified is \$100,000. In some states there is a rough correlation between the capital required for various lines of business and the amount of deposit.

New York specifies a minimum deposit of \$100,000 and a maximum of \$250,000. Kentucky specifies a minimum of \$100,000 and a maximum of \$450,000. General deposit laws are found in the statutes of a majority of the states.

Special deposits are deposits required as a condition precedent to receiving authority to transact business in a state and are made for the benefit of policyholders (and creditors) in such state. Less than one-half the states have passed such laws and with one or two exceptions they apply to fidelity and surety business only. The states of Alabama, Delaware, Florida, Georgia, Idaho and Oregon for example, require a deposit in case of companies transacting fidelity and surety business. The amount of deposit ranges from \$10,000 to \$50,000. Arkansas and Louisiana provide either for a deposit or a \*surety bond. Virginia requires a deposit from all classes of companies of not less than \$10,000 nor more than \$50,000, the amount to be determined by the Insurance Commissioner.

In general the classes of securities acceptable for both kinds of deposits are limited to the classes of securities prescribed for investment of capital.

## REQUIREMENTS FOR ADMISSION

### CAPITAL, SURPLUS AND INVESTMENTS.

In general the capital, surplus and investment requirements set as a standard for the admission of companies of other states follow the requirements applicable to domestic companies. Some states require a larger capital and surplus for other state companies than those required of domestic companies. For example: The Indiana statutes permit a domestic company to incorporate on a capital of \$100,000 and no paid in †surplus is

\*A number of states which do not provide for a deposit require the filing of a surety bond. California, for example, requires from companies transacting workmen's compensation business in the state a bond of at least \$100,000 and not less than the amount of reserve for outstanding compensation losses in the state nor more than twice such reserve.

†While Indiana does not provide for a paid in surplus, it lays upon stockholders a double liability similar to that laid upon stockholders in national banks.



specified. A company of another state, however, to be eligible for admission must have a capital of \$200,000 or assets of \$2,000,000 and a net surplus over and above all liabilities of at least \$450,000. As a rule, states do not attempt to prescribe investment requirements for companies of other states beyond the amount of the minimum capital requirement. Maryland has a rather stringent investment law which applies to both domestic and other state companies. In general the investment requirements do not impose a hardship on companies seeking admission to the various states.

#### MISCELLANEOUS REQUIREMENTS

In addition to the requirements as to capital, surplus, investments and special deposits and incidental thereto or in substantiation thereof, the following is a partial list of statements, documents, etc., which are usually required:

- a. A certified copy of the charter or articles of incorporation;
- b. A copy of the last annual statement of the company duly executed and sworn to;
- c. A certificate of the proper officer of the home state that the company has complied with the laws of such state and is duly authorized. This certificate is known as a "certificate of compliance";
- d. A certificate of deposit;
- e. A power of attorney appointing the Insurance Commissioner, some other official, or a resident of the state, attorney for service of process in actions or proceedings against the company within the state.

The foregoing cover the main requirements, documents, certificates, etc. Some states, however, have additional requirements as a result of special or peculiar laws or rulings of the supervising official. Among these may be mentioned:

- f. Appointment of a general agent;
- g. Copies of certain forms of policies;
- h. Copy of last report of examination;
- i. Copy of by-laws.

The New York law, Section 29, Chapter 28, requires that a company applying for admission must file an agreement under its corporate seal that it will not, while authorized to do business

therein, transact any business therein which a similar domestic company is prohibited from transacting.

A Wisconsin law requires that a company applying for admission must be examined by the Wisconsin Department.

A Michigan law requires that a company must have been in business for at least a year before it is eligible for admission.

#### REQUIREMENTS—FOREIGN COMPANIES

The foregoing requirements apply to stock companies of the United States. In general the requirements for companies of foreign governments are substantially the same. In lieu of capital stock, a foreign company is required to have a deposit in some one of the states for the benefit of all policyholders and creditors in the United States at least equal to the capital stock required of domestic companies.

#### REMOVAL OF SUITS TO FEDERAL COURTS

A number of states have statutes prohibiting removal of suits or actions arising in the state to the federal courts and several states require, or did require, a company on applying for admission to execute an agreement not to so remove or attempt to remove such suits or actions. The usual penalty provided for violation of the statute or agreement is revocation of license. However, the Arkansas statute covering this matter was declared unconstitutional in 1922 by the Supreme Court of the United States in the case of *Terrel, Secretary of State of Arkansas vs. Burke Construction Co.* and, while this case did not involve an insurance company, a more recent decision of the Supreme Court of Minnesota in the case of *Minnesota vs. Security Fire Insurance Co.*, decided in July, 1924, and involving the legality of statutes and agreements such as those under consideration, followed the decision of the United States Supreme Court in the *Burke Construction Co.*, case. As these two cases establish a precedent that undoubtedly would be followed in other states, such statutes may be considered as ineffective at the present time.

#### ANTI-COMPACT LAWS

Anti-compact laws, statutes forbidding companies or their agents from entering into agreements designed to prevent open and free competition, as applying to casualty companies

are found in the statutes of the following states: Arkansas, Georgia, Iowa, Kansas, Mississippi, Nebraska, Oregon, South Carolina, Texas and Washington. The number of states having such laws applicable to fire companies is much larger. The scope of the laws varies, some applying only to compacts affecting rates while others apply to rates, commissions and methods of transacting business. The enactment of rating laws since the introduction and development of workmen's compensation insurance has done much to nullify the effects of anti-compact laws and the real value of such laws under present conditions is open to question.

The Oregon statute (Section 6361, General Statutes) is a good example of one of the more comprehensive statutes. It provides as follows:

"It shall be unlawful for any insurance company authorized to transact business in this state, or any manager or any agent or representative thereof, to, either within or outside of this state, directly or indirectly, enter into any contract, understanding or combination, with any other insurance company, or any manager, or any agent or representative thereof, or to jointly or severally do any act or engage in any practice or practices for the purpose of controlling the rate to be charged, or commissions or other compensations to be paid, for insuring any risk or class or classes of risks, in this state, or for the purpose of discriminating against or differentiating from any company, manager or agent, by reason of its or his plan or method of transacting business or its or his affiliation or non-affiliation with any board or association of insurance companies, managers, agents or representatives, or for any purpose detrimental to free competition in the business or injurious to the insuring public. Whenever the commissioner shall have knowledge of any violation of this section, he shall forthwith order such offending company, manager, agent or representative to immediately discontinue such practice or show cause to the satisfaction of the commissioner why such order should not be complied with. Within thirty days from the receipt of such order, and upon a failure to comply with such order, the commissioner shall forthwith revoke the license of such offending company or agent, and no renewal of the license so revoked shall be granted within three years from the date of the revocation."

#### ANTI-DISCRIMINATION LAWS

Laws designed to prevent discrimination in rates between insurers or risks of the same class or hazard are found in the statutes of nearly all states, although in quite a few such laws apply to life insurance only. The laws vary in scope, some of the

statutes covering rebates of premiums only while others extend to any valuable consideration or inducement not specified in the policy. The Connecticut statute (Section 4122, General Statutes) while not as comprehensive as that of some of the other states, has the advantage of brevity and will serve as a satisfactory example. It provides:

“No insurance company doing business in this state, including life insurance companies referred to in Section 4121, or attorney, agent, sub-agent, broker or any other person shall pay or allow, or offer to pay or allow, as inducement to insurance, any rebate of premium payable on the policy, or any special favor or advantage in the dividends or other benefits to accrue thereon, or any valuable consideration or accept from any company, or attorney, agent, sub-agent, broker or any other person, as inducement to insurance, any such rebate of premium payable on the policy, or any special favor or advantage in the dividends or other benefits to accrue thereon, or any valuable consideration or inducement not specified in the policy of insurance. No person shall be excused from testifying or from producing any books, papers, contracts, agreements or documents, at the trial of any other person charged with the violation of any provision of this section, on the ground that such testimony or evidence may tend to incriminate him, but no person shall be prosecuted for any act concerning which he shall be compelled to so testify or produce documentary and other evidence, except for perjury committed in so testifying. Any person, firm or corporation violating any of the provisions of this section shall be fined not more than five hundred dollars.”

#### RATE MAKING LAWS

Rating laws are the outgrowth and development of anti-discrimination laws. They are of comparatively recent origin but have developed rapidly since the introduction of workmen's compensation insurance. Rating laws of one kind or another are found in thirty-seven states. As respects casualty insurance, the laws fall into two classes: (1) General laws applying to all lines and (2) specific laws applying to one or more lines. General laws of material scope are found in New York, North Carolina, Vermont and West Virginia. A few other states have general laws of lesser scope. Specific laws applying primarily to workmen's compensation and employers' liability, but in some

cases also embracing fidelity and surety and, in one instance, plate glass, are found in approximately twenty states.

The New York law, Sections 141 and 141b, Chapter 28, furnishes an example of an up to date general rating law. For an example of a specific law applying to workmen's compensation insurance, the laws of any of the following states will serve: New Jersey, Pennsylvania, Minnesota or Wisconsin.

For a detailed and more extensive discussion of anti-compact, anti-discrimination and rating laws, reference should be made to the paper of Hon. Clarence W. Hobbs entitled "State Regulation of Insurance Rates" in the *Proceedings* of this Society, Volume XI, page 218.

#### POLICY FORMS AND PROVISIONS

Aside from accident and health and workmen's compensation policies, the filing and approval of casualty policy forms is not generally required. Less than one-third of the states require the filing of all such forms either by statute or ruling and in some of these, filing only and not approval is required. There are, however, many statutes specifying that certain policies shall contain certain provisions or prohibiting the incorporation of certain provisions or conditions, particularly in the case of accident and health, liability and workmen's compensation where filing is not required. One of the more or less generally specified provisions in case of liability is the so-called bankruptcy or insolvency provision making an insurance company absolutely liable for payment of a judgement for damages regardless of the satisfaction of such judgement by the insured or the financial status of the insured. Such laws are of importance since they have the effect of changing the liability contract from one of indemnity to one of insurance. A further extension of this principal is found in laws providing for compulsory automobile liability insurance.

As an example of a bankruptcy or insolvency liability law, the Connecticut provisions are quoted: (Chapter 331, Public Acts of 1919).

"1. Every insurance company which shall issue a policy to any person, firm or corporation, insuring against loss or damage on account of the bodily injury or death by accident of any person, or damage to the property of any person for which loss or damage such person, firm or corporation is legally responsible shall,

whenever a loss occurs under said policy, become absolutely liable, and the payment of said loss shall not depend upon the satisfaction by the assured of a final judgment against him for loss, damage or death occasioned by said casualty. No such contract of insurance shall be cancelled or annulled by any agreement between the insurance company and the assured after the said assured has become responsible for such loss or damage, and any such cancellation or annulment shall be void."

"2. Upon the recovery of a final judgment against any person, firm or corporation by any person including administrators or executors for loss or damage on account of bodily injury or death or damage to property, if the defendant in such action was insured against said loss or damage at the time when the right of action arose, and if such judgment shall not be satisfied within thirty days after the date when it was rendered, such judgment creditor shall be subrogated to all the rights of the defendant and shall have a right of action against the insurer to the same extent that the defendant in such action could have enforced his claim against such insurer had such defendant paid such judgment."

Approximately twenty states require the filing and approval of accident and health policy forms under so-called Uniform Standard Provisions laws. Such laws were enacted by the various states in 1912 and subsequently following an investigation of certain features of the accident and health business by the National Convention of Insurance Commissioners in 1911. There are two forms of such laws. The earlier laws enacted prior to 1914 specified the provisions to be included without specifying the wording of such provisions, and the later laws enacted in 1914 and subsequently which specified the exact wording of the provisions. Both laws prohibit the inclusion of certain provisions. The Massachusetts law serves as an example of the earlier laws and the New York law of the later laws. As the sections covering the provisions are rather lengthy, they are not quoted\*.

Approximately twenty states require the filing and approval of workmen's compensation policies and in most of the other states having workmen's compensation acts, the law specifies certain provisions which must be included or prohibits the inclusion of certain provisions. A standard basic form of policy known as the "Standard Workmen's Compensation and Employers' Liability Policy" is used in nearly all states and made applicable

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\*For Massachusetts law, see Chapter 175, Sections 108-110. For New York law, see Chapter 28, Section 107.

to the provisions of the workmen's compensation acts of the individual states by means of endorsements.

#### RESIDENT AGENTS LAWS

Resident agents laws, statutes of a sort of paternalistic nature, designed to secure to resident agents the commission on all business written on property or other interests located within the state are found in the statutes of nearly forty states. Such laws have resulted in considerable friction and misunderstanding between companies, agents and Insurance Departments and have recently come into the limelight in connection with a well advertised plan of wholesale automobile insurance. A good example of such a law is found in the Connecticut statutes (Section 4290, General Statutes) which provides as follows:

"No insurance company, corporation or association incorporated under the laws of any other state of the United States, or under the laws of any foreign country shall issue or deliver any policy of, or make any contract of insurance on, either persons or property in this state, or covering any hazard or risk in the performance or non-performance of any duty relative to any contract or obligation, performed or to be performed in this state, or in connection with any obligation or duty which is governed or controlled by the laws of this state, but actually to be performed by any individual, firm or corporation not resident in this state, unless such policy or contract is issued through and countersigned by a lawfully constituted and licensed resident agent of this state, PROVIDED, nothing in this section shall be construed to apply to contracts or policies of life insurance or to certificates of fraternal benefit societies, or to insurance covering the rolling stock of any railroad, or to other common carrier, or to property in transit, or to reinsurance between companies."

#### AGENTS QUALIFICATIONS LAWS

Agents qualifications laws have received considerable attention by state supervisory officials and others during the past few years chiefly for the following reasons:

First: Because of the growing complexity of insurance contracts and extension of classes of coverage, the interests of the insuring public demand that an agent possess proper qualifications as to character and reputation and a reasonable understanding of the contracts he is engaged in selling.

Second: The entrance into the agency field of persons whose principal business is other than insurance, particularly those engaged primarily in the automobile business.

As yet but few states have passed agents qualifications laws. The most stringent law on the subject passed to date is that of Connecticut, enacted in 1923, which provides in part as follows: (Chapter 253, Public Acts of 1923)

"Sec. 1. An insurance agent is defined as a person authorized in writing by any insurer authorized to transact business in the state, to solicit, negotiate or effect contracts of insurance, surety or indemnity; or any member of a copartnership or association, or any stockholder, officer or agent of a corporation authorized to solicit, negotiate or effect such contracts, when such copartnership, association or corporation shall hold a direct agency appointment from any insurer.

"Sec. 2. No person shall engage in business as an insurance agent until he shall have obtained from the insurance commissioner a license therefor under the provisions of this act. Each applicant for such license shall file with the commissioner his written application for a license authorizing him to engage in business as an agent in the general or some specified line or lines of insurance, surety or indemnity coverage, which, under the provisions of the general statutes, may be written in the state, which application shall be accompanied by a statement, signed and sworn to by such applicant, on a blank furnished by the commissioner, setting forth such facts as he may require, and by the affidavit of an official or representative of an insurer authorized to transact business in the state or of a licensed insurance agent of the state, that the applicant is personally known to him; that the applicant has experience, or will be instructed, in the general or some specified line or lines of insurance, surety or indemnity coverage and that the applicant is of good reputation and worthy of a license.

"Sec. 3. The insurance commissioner, his deputy or an employee of the insurance department authorized by said commissioner, shall examine each person applying for the first time for a license to act as an insurance agent and, in his discretion, may examine any applicant for renewal of such license as to his qualifications to act as such agent. If said commissioner shall be satisfied that such applicant possesses the qualifications required by section two hereof and that he is reasonably familiar with the provisions of the general statutes relating to insurance and with the terms and conditions of the policies or contracts, he is proposing to solicit, negotiate or effect, he shall issue to such applicant an insurance agent's license to transact business in the state on behalf of any insurer certifying such applicant's name. Such license shall expire on March thirty-first in each year unless sooner revoked for cause by said commissioner."



Under the provisions of Section 3 of the above quoted act, the Insurance Commissioner is requiring new applicants for a license to satisfactorily pass a written examination on the subject of insurance coverages and policy provisions.

#### RECIPROCAL AND RETALIATORY LAWS

Nearly all states have enacted some form of reciprocal or retaliatory law. Such laws are in general the same regardless of by what name they are designated, their purpose being retaliatory rather than reciprocal. They usually apply to taxes, fines, penalties, licenses, fees and deposits. The following quotation from the Pennsylvania statutes (Section 212, Insurance laws) will serve as an example of such laws:

“If by the laws of any other State, any taxes, fines, penalties, licenses, fees, or other obligations or prohibitions, additional to or in excess of those imposed by the laws of this Commonwealth upon insurance companies, associations, and exchanges, of other states and their agents, are imposed on insurance companies, associations, and exchanges of this Commonwealth and their agents doing business in such State, like obligations and prohibitions shall be imposed upon all insurance companies, associations, and exchanges and their agents, of such State doing business in this Commonwealth, so long as such laws remain in force.”

An example of a purely reciprocal law applying to taxes and fees is found in the Connecticut statutes (Section 1344, General Statutes) which provides as follows:

“Every insurance company or association incorporated by or organized under the laws of any other state and admitted to transact business in this state, and each agent of every such insurance company, shall pay the same fees and taxes to the insurance commissioner of this state as are imposed by such other state upon any similar insurance companies incorporated by or organized under the laws of this state, or upon the agents of any such companies, transacting business in such other state.”

#### TAXES, LICENSES, FEES AND ASSESSMENTS

A consideration of the many laws imposing taxes, licenses and fees would be a rather extensive undertaking and only a brief reference will be made to this subject.

Of the various taxes imposed, state taxes on premiums are the most important and account for a good share of all taxes collected

by the states or any of their political subdivisions. In all states except Nevada, casualty companies are subject to some form of \*premium tax. The rate of tax on premiums varies between one and †two and three-quarters percent. There is a lack of uniformity in the basis of assessing premium taxes. Some states base the tax on net gross direct premiums only, without consideration of reinsurance premiums accepted or ceded; others (a majority) base the tax on net premiums, including reinsurance premiums received less reinsurance premiums ceded; still others specify some modification of the two above bases.

The laws of some states provide for income and franchise taxes and county and municipal taxes or fees. In addition fees for filing annual statements and other documents required by law to be filed are quite general. Publication fees are also required in a considerable number of states.

Assessments for the maintenance and support of industrial accident boards and rating bureaus are provided in many of the states having compensation acts. For detailed information regarding taxes and fees imposed by the various states, reference should be made to the pamphlet "Fees and Taxes Charged Insurance Companies under the laws of New York together with Abstracts of Fees, Taxes and Other Requirements of Other States" published annually by the New York Insurance Department.

#### ANNUAL STATEMENTS AND MISCELLANEOUS

The limiting date for filing annual statements is prescribed by statute in all states. In all but a few states the date specified is March 1st. In some of the states specifying an earlier date, authority to extend the time for filing, for good cause shown, is granted the supervising official.

In some states the law specifies in more or less detail what items shall be included in the statement and how certain assets shall be valued and liabilities determined. In other states the law specifies that the annual statement shall be filed on the form of blank

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\*Connecticut does not collect a premium tax from domestic companies but imposes capital stock and franchise taxes.

†Two states, Tennessee and Virginia tax workmen's compensation premiums at a higher rate but such taxes are designed to cover a part of the expenses of the administration of the compensation act.

furnished by the Insurance Commissioner or on the form adopted by the National Convention of Insurance Commissioners, although there are generally other provisions in the law covering the valuation of assets and determination of liabilities.

The following laws or requirements should be noted in connection with the determining of assets and liabilities. Real estate and bonds and stocks are valued at market prices regardless of cost. Furniture and fixtures, supplies, printed matter and stationery are not allowed as an asset and if included in the gross assets, must be deducted as assets not admitted. Premiums in course of collection over 90 days due must be deducted as assets not admitted.

In case of liabilities, the reserve for unpaid losses except liability, workmen's compensation and credit must include an estimated amount for losses incurred but not reported. Incurred but not reported or accrued credit losses are reserved for on the basis of a formula reserve—50% of the premiums earned less loss payments.

Liability and compensation losses including losses incurred but not reported are reserved for on the basis of a combination of specific case reserves and a formula reserve based upon the differences between certain percentages of earned premiums and losses and loss expenses paid. The basis used for any calendar year of issue at any statement year depends upon the period of time elapsed since the calendar year of issue and in one instance (the calendar year of issue two years prior to the statement year) upon which basis produces the larger reserve. This particular annual statement requirement was incorporated in the convention form of statement as a result of legislation proposed by the National Convention of Insurance Commissioners and adopted in several states in 1911, the law being known as the "Uniform Liability Loss Reserve Law." It has subsequently been amended and extended to cover workmen's compensation losses and more generally adopted by the states. At the present time approximately twenty states have adopted the law and since the annual statement blank provides for determining the loss reserve in accordance with the law, the effect, in case of those states which have not enacted the law but adopt or specify the convention form of annual statement blank, is the same as if the law had been enacted.

As the law takes up several printed pages, it is not quoted in this paper. It has been modified in some states but the Connecticut statutes (Sections 5410-5412) furnish an example of the law as approved by the National Convention of Insurance Commissioners. Reference should also be made to Schedule P of the Convention Annual Statement blank.

The reserves provided for by the Uniform Law are concisely as follows:

Year in which policies were issued (Prior to year of statement)	LIABILITY	COMPENSATION
10 or more	\$1500 per suit	Present value of unpaid claims
9	1000 " "	" " " " "
8	1000 " "	" " " " "
7	1000 " "	" " " " "
6	1000 " "	" " " " "
5	1000 " "	" " " " "
4	850 " "	" " " " "
3	850 " "	" " " " "
2	750 per suit or 60% of earned premiums less losses and loss expenses paid, whichever is greater.	Present value of unpaid claims or *65% of earned premiums less losses and loss expenses paid, whichever is greater.
1	60% of earned premiums less losses and loss expenses paid.	*65% of earned premiums less losses and loss expenses paid.
Current	60% of earned premiums less losses and loss expenses paid.	*65% of earned premiums less losses and loss expenses paid.

\*The California law specifies 70%.

It should be noted, however, that as respects the reserve for compensation losses, the Convention Annual Statement blank has been amended to conform to amendments to the New York Law enacted in 1925 which provide that for policies issued in the year of statement and the year prior, the reserve in each case shall be 65% of the earned premiums less losses and loss expenses paid or the present value of unpaid claims whichever is greater, instead of 65% of the earned premiums less losses and loss expenses paid.

The basis of determining the unearned premium reserve is usually prescribed by statute although a few states have no law

on the subject as respects casualty companies. The basis most generally prescribed is 50% of all premiums in force under policies running for a term of one year or less and a *pro rata* amount under policies for longer terms. In lieu of the 50% basis, some states permit the computation on the basis of the actual unearned portions of the premiums in force. This basis is seldom used owing to the large amount of work involved but a modification thereof, the semi-monthly basis, is frequently employed and accepted by the various Insurance Departments. The semi-monthly basis, under which the reserve is kept by monthly instead of yearly expirations—all policies issued in any month being considered as issued in the middle of the month—gives a close approximation to the actual unearned premium reserve, particularly in case of business of a seasonable nature, such as automobile.

#### LIMITATION OF RISKS

Nearly all states have laws limiting the net amount of liability which a company may be allowed to assume on any single risk or hazard. The limit most generally specified is 10% of capital and surplus although some states specify a higher percentage.

The brief outline of statutory requirements contained in the foregoing pages is intended only as a general presentation and *résumé* of the more important statutory requirements affecting stock and foreign casualty companies. Certain specific requirements of the various states may be found in insurance publications, particularly "The Insurance Year Book" Casualty Edition, published by the Spectator Company, New York. In any questions of importance concerning the statutory requirements of particular states, such for example as the incorporation of a new company or applications for admission to transact business, the statutes of the state or states should be consulted and supplemented where necessary by first hand information obtained direct from the state supervising officials.

## ON THE TENDENCY OF LABOR SAVING TO INCREASE COMPENSATION COSTS

BY

LESLIE L. HALL

The purpose of this paper is to call attention to the general tendency of labor saving methods to increase compensation costs, principally because of the relative increase in accidents wherever non-hazardous payroll is diminished by the substitution of machines for men, and to suggest ways and means of making a thorough-going investigation of the subject.

During the past few years there has been much speculation as to the cause of the increase in compensation costs. Undoubtedly the marked increase in loss ratios, which was first observed under policies issued in 1921, was due very largely to the drastic rate decreases which became effective about that time as a result of using the abnormally favorable experience of the war years, as well as to the effects of the economic depression. The situation was so serious as to require concentration of attention upon immediate remedial action in the way of an adjustment of rates to fit the new conditions, and this necessarily operated to postpone a study of the depth and thoroughness required to determine definitely the underlying causes. Such a study would have involved many difficulties because of the obstacles that must be overcome in any attempt to isolate and determine the effect of the many intangible, overlapping and frequently conflicting elements contributing to the general result. But we have now reached a stage when it would seem desirable to return to this problem and devote further efforts to its solution. It is with the thought that this paper may contribute in a small way to open up avenues of investigation of one phase of the problem that it is presented at this time.

The elements causing increases in losses may, in a general way, be divided into two groups. Some tend to produce increases in the cost per accident independently of the actual rate of occurrence of accidents; others tend to produce absolute in-

creases in accident frequency. As examples in the first group, the following may be listed:

1. Amendments to the compensation laws liberalizing their provisions.
2. Increased liberality of awards on the part of adjudicating bodies.
3. An increase in severity of accidents due either to an increasing prevention of the non-serious accidents or to changes in industrial methods such as an increasing use of machinery.
4. A stimulation of malingering due to the increase of benefits to a point more nearly approximating the actual wage.
5. Higher charges for the services of physicians, hospitals and other medical items.

As examples of conditions causing increases in accident frequency, the following may be cited:

1. Industrial activity. The men in industry being pressed to increase production to the highest point, do not have an opportunity to exercise the thought and care that would be used if they were not working under pressure.
2. An increase in the carelessness of employes in industry. This may in part, be an aftermath of the war where men were exposed to such great danger that upon their return to industry, the risks seemed so slight as to be practically insignificant.
3. Desire for adventure. Under our present day civilization, this finds comparatively little outlet and the so-called recklessness may be simply a manifestation of the innate desire to get some excitement out of life.
4. Faulty educational methods. We are living in a mechanical age and if people generally are unfamiliar with mechanical and other present day hazards, they are not so well qualified to cope with them as would be the case if they knew more about them.
5. Readjustments of industry may increase accidents during the readjustment period because of the difficulty of employes adjusting themselves to the new conditions; also during periods of activity a host of unskilled employes enter industry, among whom the accident rate, because of lack of skill and experience, is abnormally high.
6. Labor saving methods, that is more efficient methods and the increasing substitution of mechanical for manual processes.

There are doubtless many other possible causes which could be included in the above groups but the foregoing appears to cover the more important ones. Some of these causes may be of only a temporary character, others of a semi-permanent character but eventually reaching a saturation point, while still others may be permanent but of decreasing importance.

Of all these causes, the one dealing with the constant introduction of labor saving methods has been given comparatively little attention. This seems strange when one considers that the compensation movement itself grew out of the change in industrial processes and relations that developed from the substitution of machine for hand labor. Our apparent indifference to the subject might imply the belief that industrial processes are now completely stabilized or that the changes are too slight to warrant general study and investigation. As a matter of fact, the contrary seems to be the case. Industry generally, during the past series of years has been forced to give a steadily increasing amount of attention to the control of labor costs. Industrial executives, engineers, scientists and inventors are giving the subject their constant thought. Even in trade and commerce and the offices of carriers writing this form of insurance, the problem is never lost sight of. Efforts in this direction have been along two lines which have a certain interrelation, namely, first an attempt to increase efficiency in production, second an attempt to replace labor where practicable by machinery or, we may say, by an increased mechanization of industry.

Efficiency as here referred to, consists in rearranging buildings, departments, machines and processes for the purpose of securing a more direct and rapid flow of materials, the elimination of non-productive labor or operations or other lost motion. Mechanization consists in doing partially or entirely by machinery, something which has previously been done by manual effort, either alone or with slight mechanical assistance. It is not suggested that this cause could be chiefly responsible for the sudden change in accident experience affecting industry as a whole which has been experienced during the past few years. Nevertheless, it is believed that it exists as a constant factor working towards increased loss ratios, which at times may be completely counteracted by the accident prevention and wage increases or at others may be augmented by one or more of the previously enumerated causes.



We find examples of mechanization wherever we look. We find it in the factory, on the farm, in construction work, in the mine, in the store, the office and even the home. Witness the almost innumerable automatic and semi-automatic machines in the factories, the tractor operated by one man and pulling several plows on the farms, the machines for building concrete roads, the undercutting machines in the coal mine, the package and money carrier systems in the store, the tabulating, sorting, billing and duplicating machines in the office and the vacuum cleaner, power washing and ironing machines in the home. These changes are constantly being introduced, but they come so gradually that the effect is not realized.

The writer has made some attempts to measure the effect of this constant evolution but because of the lack of sufficiently refined statistical data, the results in this direction have not been satisfactory.

Figures, presented herewith, which were compiled from the reports of the U. S. Bureau of the Census demonstrate the general effect. A study of these figures will indicate that the ratio of horsepower to man power in several important industries, taken for various time intervals, has shown a marked and very generally persistent upward tendency.

It is unfortunate that comparable figures for the next five year interval (1924) are not available. This is due to the fact that the mode of taking the census has been changed and the methods of tabulating the significant data modified.

It will be noted that in the case of the milling industry, there has been but little change in the ratio. This is an industry which has always been highly mechanized. Almost all of the operations are entirely mechanical, the men in the industry being almost exclusively engaged in seeing that the machines operate properly.

In the case of some of the industries, there is a decided drop in the ratio of horsepower to man power as between 1914 and 1919 but it will be noted that this drop was not due to any decrease in the horsepower, which continue to rise but rather to the very material increase in the number of employes. It will be recalled that 1919 was one of the years of inflation following the war period, consequently it would seem inherently probable that some of these industries were either working more than one

shift or else they were unable or unwilling to install mechanical equipment to cope with the demands for increased production. It will also be recalled that the experience under 1919 compensation policies was favorable. Attention might also be directed to the fact that the industries showing the higher ratios are in general, the more hazardous industries.

If figures comparable to those herein were available, they would not only indicate whether or not the ratios for these particular industries again exhibited an upward trend, but might also make it possible to ascertain, at least in part, whether or not there is any significant relation between these ratios and compensation loss ratios.

In any event, these figures demonstrate that over a substantial period of time, the tendency has been for labor to contribute relatively less to the productive powers of industry and machinery relatively more. This, as affecting compensation loss ratios, has a dual significance. These ratios may be regarded as a fraction, the numerator of which expresses accidents and the cost of compensating them, the denominator of which expresses the payrolls used as the measure of exposure. In considering the effect of this or any other tendency, consideration must be given to possible effects upon either numerator or denominator.

Substitution of machinery for labor may be considered as falling into three classes (a) where the substitution of machinery for manual labor involves a hazard to the employe distinctly less, (b) where it involves no material change, (c) where it involves a hazard distinctly greater. It is believed however, that for industry generally, the substitution makes for an increased hazard to the employe. Inasmuch as the substitution is intended to effect an increase in production or the maintenance of the same production with a decreased personnel, it may however, even in the last case not change the hazard per unit of production or even diminish it.

For purposes of analysis, it may be assumed that the general effect will be a diminution in the number of employes. In the class of cases indicated as "(a)", namely, where the substitution involves a reduction of hazard to the employe, the effect upon the numerator of accidents is twofold, namely a diminution of the average number of accidents per employe and a diminution of the number of employes, thus effecting a notable reduction. In

class (b), there is only the diminution of the number of employes effecting a reduction therefore, less marked than in the preceding class. In class (c), since the hazard per employe is increased and the number of employes is diminished, the result may be to increase or decrease the numerator, the two changes having a diametrically opposite effect.

In all cases, since the number of employes is reduced, there may be a reduction in payrolls, thus diminishing the denominator of payrolls. Hence in any case, owing to the reduction of the denominator, the net effect of the change may be to produce a mounting loss ratio, the probability of such an effect being greatest in class (c) which is believed to be the class most characteristic of industry generally.

It must be borne in mind, however, that a change from manual labor to machinery frequently involves an effect on the industry as a whole relatively insignificant. Machinery may be rearranged or conveyors installed to reduce manual transportation or trucking between various operations, sprayers or "guns" may be installed to apply finishes in place of the hand brush method. Any number of small changes such as these may be made, and though the importance of each is slight, taken in the aggregate, the effect on loss ratios may be considerable.

For example, a furniture factory doing all of its finishing by hand, may install paint "guns". The first question to be considered will be the effect on the losses in the finishing department. Applying finishes by hand is comparatively non-hazardous. There is some doubt as to the hazards incident to spraying.

Without attempting to solve this question, assume that the hazard per man exposed is the same with the spray method as with the hand brush method. The next question to be considered is the effect on the denominator. By use of the spray method, it will be possible to diminish the personnel in the finishing department and still maintain production. Most of the accidents in furniture factories occur in the machine or mill department. That is, the mill department is the high hazard department while the assembling and finishing are of less hazard. In the case of such an industry, the losses in all departments would be spread over the entire plant payroll by reason of the use of a compensation insurance classification and rate contemplating the complete operation. As a result, the loss cost per unit

of payroll would be higher after the change because of the diminution of the non-hazardous payroll. If this diminution of payroll in the finishing department were material, the same result would occur even if the hazard per man with the spray method were less than with the hand method. This is obviously because the initial hazard of this department was much less than the average hazard of the factory as a whole. Consequently, while the reduction in hazard in this department would tend to reduce the average hazard per unit of payroll for the plant as a whole, the reduction of payroll in this department would operate more strongly to increase it.

This result could be counterbalanced by either of two things. Safety activities might reduce the accident cost in the plant as a whole in the same proportion as the payroll reduction occasioned by the diminished personnel, but there is no reason to believe that such accident reduction would be coincident with the payroll reduction. Wage increases might be made in an amount sufficient to absorb the reduction. There appears slight probability that increases to such an extent would be made because the employer would lose all incentive to incur the capital charges incidental to the purchase of new equipment if the entire savings effected by such purchases were immediately to be absorbed by higher labor costs.

Another illustration of changes in finishing departments is found in automobile factories. Certain parts, such as fenders, are enameled by being dipped. At one end of a very long, slow-moving conveyor, the parts to be finished are hung on the conveyor by a single employe. They slowly move into and through a tank of enamel, passing from this over troughs into which the excess enamel drips. They then pass through an oven for baking. This process is repeated twice more, after which the parts are detached from the conveyor by an employe stationed at the discharge end. A process of this kind, used wherever practicable, reduces the payroll to a point much below that required for finishing either by the hand brush or spray method. Now the finishing department in the automobile factory represents a low hazard department; consequently payroll reductions in this department tend to cause an increase in the loss cost per unit of the plant payroll.

Another case is in the textile industry where the knot tying

machine, essentially non-hazardous, is able to do the work of several employes engaged in a non-hazardous manual operation.

In the printing industries, the linotype and monotype machines, although far from being recent developments, are constantly being introduced into plants which have previously used hand composition.

These machines are not only more hazardous, per man engaged, than hand composition but each machine is capable of doing the work of several hand compositors. Furthermore, since hand composition is less hazardous than the operation of printing presses, the introduction of machine composition tends not only to reduce the payroll but to increase the hazard as well.

In the brick industry, the introduction of the continuous, oil fired kiln replaces the payroll previously engaged in piling bricks in the older style temporary kiln. In this case, there is some doubt as to the relative hazard per man as between making the bricks and piling them in the kilns although it is believed that the manufacturing operations are more hazardous. If that is the case, then the effect of the introduction of the continuous kiln would be to increase the average hazard of the plant as a whole.

In the cigar industry, cigar making machines are constantly replacing hand labor. The modern shoe repair shop using machinery to a considerable extent, is replacing the older hand operation.

In some industries changes very materially reducing the accident cost have been made. A notable example is in the steel industry where, in addition to other important changes, the hazardous transfer and transportation of hot metals by man power was replaced by comparatively non-hazardous mechanical methods.

There are many other outstanding cases where the general direction in which labor saving might affect loss ratios can be determined by observation. There are innumerable cases where the approximate effect can be determined only by statistical investigation. Such an investigation might properly be undertaken from more than one viewpoint. From the humanitarian viewpoint, it is highly desirable to ascertain whether the substitution of machines for men tends generally to produce a greater hazard to the employe, and if so, the extent to which this may be or is being neutralized by safety engineering. From the rate

making viewpoint, this is likewise important but quite as important is the effect on loss ratios produced by the changes in payroll incidental to such substitution.

In any event, the investigation should be made by industries. From the rate making point of view, it might advantageously take the form of a comparison of accident costs over a series of years as between mechanical and non-mechanical accidents. In using accident cost figures, it would of course, be necessary to make suitable modifications to discount changes in the compensation law and changes due to the general upward trend of medical costs. There are, to be sure, elements listed in the early part of this paper, bearing on the increase in cost per accident and in the increase of accident frequency, other than law changes and medical cost changes, and other than the element of change from hand labor to mechanical labor, but these appear not statistically measurable and would in any event, apply to all classes of accidents in about the same degree.

From the non-ratemaking point of view, the investigation should present a comparison by industries of mechanical and non-mechanical accidents, suitably weighted to measure severity with the employe now as the unit of exposure.

Such investigations should indicate which industries are becoming more hazardous, whether measured in terms per unit of payroll or in terms per unit of employe exposure. They would not however, bring out every case of increased cost due to labor saving for there are cases where there should be no material change in the ratio of mechanical to non-mechanical accidents. One of these is the change from hand to spray painting. Neither of these processes would contribute an appreciable number of accidents which would be classified as due to mechanical causes. The principal effect of this change would be to decrease the number of employes exposed to comparatively low hazard. The investigations might perhaps with advantage, undertake to measure the hazard trend in terms of units of production. This would involve determination of the average number of units of production per unit of payroll or per unit of employe exposure and would be the most feasible in case of industries of the so-called "basic" type, such as brick making, steel making, cloth spinning and weaving and the like, where the product has not been materially changed during the period under investigation:

thus eliminating all questions and complications due to changes in product, as in furniture manufacturing, or to variety of product, rendering the choice of a suitable unit of production impossible. This investigation would be interesting as showing whether, even though it should appear that industry was becoming more hazardous to the individual employe, it might not still effect the same volume of production with a diminished human wastage.

It would also, from the rate making point of view, be interesting to collect figures showing whether the proportion of compensation cost per dollar of value of the finished product, is becoming greater or less.

Finally, some consideration should be given to the question whether the present trend towards mechanization of industry will be maintained. This involves several considerations.

1. The necessity for effecting economies in labor cost depends upon the available supply of labor and the rate of wages, and secondarily therefore, upon such general economic and social questions as immigration, natural increase of population, the labor movement, the shift of population to the cities and the like.

2. The possibility of continuing the present program is also to be considered. It is probable that the peak of the movement has not been reached, and that it will not be reached during the life of the present generation, although there is undoubtedly a point beyond which the human element cannot profitably be replaced by machinery.

Mr. Edward A. Filene of Boston, is quoted in an article on immigration appearing in the September 26, 1925 issue of the *Saturday Evening Post* as saying:

"Employers do not need an increased labor supply, since increased use of labor saving machinery and elimination of waste in production and distribution will, for many years, reduce costs more rapidly than wage increase."

This appears to be a logical point of view since there is little reason to believe that the human race will not be as mechanically ingenious in the future as in the past.

TABLE I

SHOWING THE RATIO OF HORSE POWER TO MAN POWER IN CERTAIN INDUSTRIES AT DIFFERENT  
TIMES AS INDICATED BY THE UNITED STATES BUREAU OF THE CENSUS REPORTS

Industry	1889			1899			1904			1909			1914			1919		
	Primary Horse Power	Wage Earners	Ratio	Primary Horse Power	Wage Earners	Ratio	Primary Horse Power	Wage Earners	Ratio	Primary Horse Power	Wage Earners	Ratio	Primary Horse Power	Wage Earners	Ratio	Primary Horse Power	Wage Earners	Ratio
Agricultural Implements	50,395	38,827	1.3	70,646	46,592	1.5	89,738	47,394	1.9	100,601	50,651	2.0	121,428	48,459	2.5	128,249	54,358	2.4
Arms and Fire Arms		2,158		2,980	5,231	.6	5,056	7,410	.7	10,317	8,713	1.2	11,354	11,493	1.0	39,128	22,816	1.7
Beef Canned	87,571	21,849	1.3	47,257	27,165	1.7	69,494	33,168	2.1	106,120	40,618	2.6	122,700	40,306	3.0	265,688	75,051	3.5
Cheese, Condensed Milk	25,586	18,219	3.1	88,062	12,799	6.9	93,845	15,557	6.0	101,349	18,431	5.5	130,862	23,059	5.7	169,871	35,313	4.8
	1,680	8,821	.4	4,165	8,685	.5	6,982	10,567	.7	12,831	16,427	.8	14,398	14,511	1.0	16,201	16,577	1.0
Food Preserving	7,000	61,812	.1	38,624	57,012	.7	60,831	55,944	1.1	81,179	59,968	1.4	120,004	74,071	1.6	180,812	89,923	2.0
Trucks, Wagons & Materials				82,771	73,812	1.1	106,159	77,882	1.4	126,032	69,928	1.8	112,549	52,391	2.1	64,666	24,682	2.6
Pipes					15,163		132,394	19,847	6.7	208,657	23,729	8.8	282,385	32,311	8.7	376,940	55,556	6.8
Food & Allied Prod.					2,756	2.1	7,204	2,090	3.4	10,593	2,826	3.7	19,736	4,160	4.7	33,440	9,083	3.7
Food & Cocoa Prod. & Confectionery & Ice Cream					2,756	2.1	7,204	2,090	3.4	10,593	2,826	3.7	19,736	4,160	4.7	33,440	9,083	3.7
Food & Allied Indus. Preparations	121,821	123,156	1.1	252,502	105,693	2.4	360,280	118,449	3.0	451,186	132,696	3.4	465,152	125,897	3.7	434,836	104,849	4.1
Pharmaceuticals	3,439	10,485	.3	12,707	19,028	.7	17,008	20,472	.8	25,659	22,895	1.1	28,872	25,502	1.1	40,571	38,417	1.1
Ships, App. & Supp.	7,494	8,802	.9	42,674	42,013	1.0	105,276	60,466	1.7	158,768	87,256	1.8	227,731	118,078	1.9	438,839	212,374	2.1
Locomotives & Aircraft					670,719	20.8	775,318	39,110	19.8	853,584	39,463	21.6	822,364	39,718	20.7	876,405	45,481	19.5
Flour & Grist Mill Prod.					32,226	20.8	775,318	39,110	19.8	853,584	39,463	21.6	822,364	39,718	20.7	876,405	45,481	19.5
Chemicals	165,875	536,237	2.2	1658,594	508,766	3.2	1886,624	532,566	3.5	2340,082	695,019	4.1	2734,014	614,548	4.4	2922,656	610,246	4.8
Products of Glass	25,241	44,892	.6	52,943	52,818	1.0	91,476	63,969	1.4	123,132	68,911	1.8	163,139	74,502	2.2	207,430	77,520	2.7
Starch					25,986	8.7	28,577	24,640	7.7	29,257	4,773	5.9	42,639	4,509	9.2	52,846	7,795	6.7
Beer				1598,073	222,490	7.2	2422,577	242,640	10.0	3274,400	278,505	11.8	3928,826	278,072	14.1	5420,349	416,748	13.0
Textile Industry	60,031	42,592	1.4	88,880	52,109	1.7	117,450	57,239	2.1	148,140	62,202	2.4	172,712	55,936	3.1	218,238	72,476	3.0
Textile Machinery & Mach. Tools					6,880	14.6	191,660	19,101	19.0	317,789	16,114	19.7	461,988	23,011	20.1	572,970	30,247	18.9
Iron and Steel	11,788	16,096	.7	23,288	24,981	.9	34,259	38,617	.9	49,417	48,041	1.1	57,902	48,768	1.2	91,258	68,741	1.3
Wheeled Vehicles & Parts				19,847	17,525	1.1	5,750	3,319	1.7	5,922	4,437	1.3	8,753	6,680	1.3	14,806	10,886	1.4
Shoes & Hats & Eyes	1,183	1,827	.6	2,103	2,633	.8	2,440	3,965	.6	4,542	4,638	1.0	4,813	5,330	.9	8,467	9,294	.9
Oil & Petroleum				7,561	3,230	2.3	10,112	3,883	2.6	16,125	5,201	3.1	22,272	5,651	3.9	28,010	6,544	4.3
Refining	32,556	11,403	2.9	36,127	12,199	3.0	46,019	16,770	2.7	90,288	15,929	6.5	128,468	25,366	5.1	236,906	58,889	4.0
Textiles & Dyeing & Finishing					651	11.6	15,866	1,492	10.6	123,477	109,484	1.1	174,881	130,641	1.3	196,793	131,879	1.5
Printing & Polishing Industry	27,125	20,182	1.3	71,169	36,565	1.9	86,808	48,873	2.0	122,426	49,264	2.5	199,543	74,022	2.7	429,887	158,549	2.7
Printing							78,127	50,754	1.5	88,063	40,506	2.2	115,233	44,489	2.6	553,711	387,446	1.4
Meat Packing				85,008	68,396	1.2	115,956	74,124	1.6	202,432	87,813	2.3	253,066	98,832	2.6	359,212	160,996	2.2
Refining				95,740	24,512	3.9	141,928	26,853	5.3	206,537	29,707	7.0	261,419	34,733	7.5	447,779	37,579	11.9
Electric Industry							20,228	11,044	1.8	28,360	12,999	2.2	38,737	14,172	2.8	33,710	20,436	1.6
Electric Cars				25,395	33,453	1.0	59,994	34,058	1.7	97,797	43,086	2.3	126,687	54,288	2.3	157,865	82,298	1.9



A STUDY OF JUDICIAL DECISIONS IN  
NEW YORK WORKMEN'S COMPENSATION CASES

BY

LEON S. SENIOR

A knowledge of court decisions and their tendencies in workmen's compensation cases is of importance to the casualty actuary for the same reason that an understanding of legislative enactments is necessary to a proper valuation of insurance costs. I have a feeling that this element of cost reflecting judicial decisions has not received the same careful attention, and has not been subjected to the same studious process of analysis as the changes in legislation that take place almost every year. The indifference on this subject may be ascribed to an imperfect appreciation of the part played by the courts in changing the scope of the law. There exists a wide-spread belief that the legislature alone is responsible for creative law, and that the functions of the courts are limited to construction and interpretation. This idea is based on a superficial understanding of the forces which operate to create law.

It is not difficult to follow the evidence of juristic writers to the effect that the process of lawmaking goes on continuously in the courts to a greater extent than in the halls of the legislature. Indeed, it has been asserted that the latter could achieve nothing more than to give better form to the results of judicial development.

Undeniably, the workmen's compensation law is a piece of creative legislation to be credited to the legislature and not to the courts.<sup>1</sup> It is true, that for a time the American courts have opposed the principle of workmen's compensation on the ground that the doctrine of "liability without fault" was repugnant to the *fundamental principles of the common law*, and to the "due process" clause in the Fourteenth Amendment of the United States Constitution. But the swift changes in the court decisions on this subject that have taken place within a brief decade are noteworthy.

1. Prof. Roscoe Pound: Interpretations of Legal History.

From the extremely conservative point of view expressed in the *Ives* case<sup>2</sup> to the philosophical liberalism of the decision in the *White* case<sup>3</sup> is only a matter of six years. In the interim the New York State Constitution has been amended, a compulsory law enacted in that state, and elective laws adopted in several other states. Public opinion had crystalized and found expression in the press, in the political forum and in legislation. In face of this expression the traditional conservatism of the courts has been abandoned and previous dogmatic conclusions reversed. It was discovered that "liability without fault" was not altogether strange to the English common law, and that rules governing responsibility as between employer and employee are not beyond alteration by legislation in the public interest. The social, political and economic influences that govern the creation and development of law had been at work and their reflex became apparent in the legislation, as well as in the court decisions of the period. Whether we accept the results as due to an aroused public opinion dissatisfied with the courts and their limitations of the employers' liability or to the rise of trade unionism with its demand for a more just conception of the rights of the workman, or to the class conflict as reflected in the Marxian philosophy of economic determinism, the fact remains that in an incredibly short time the constitutional barriers, real or illusory, have been swept aside by legislation and court decision. Once more our lawmakers, legislative and judicial, have shown ability to move in the direction of reform and social progress.

Addressing myself to the inquiry as to the attitude of the courts in passing on the numerous questions affecting compensation law, it is my purpose to give a *résumé* of selected cases covering the more important decisions in an effort to discover the principles governing these decisions and to ascertain if there exists any discernible tendency in the interpretations laid down by the courts.

To an audience familiar with the background of social legislation, it is not necessary to go into detail regarding the purpose of the legislature in substituting the principle of workmen's compensation in place of liability for negligence; but it is well to

2. *Ives v. South Buffalo Railway Co.*, 201 N. Y. 271, Mar. 24, 1911.

3. *New York Central Railroad Co. v. White*, 243 U. S. 188, Mar. 6, 1917.

emphasize at the beginning that it was the intent of the legislature that workmen's compensation laws should be liberally construed. With the object of carrying this intent into effect, it has discarded traditional rules of evidence, simplified the procedure, established presumptions of fact and law in favor of the claimant, and otherwise provided for a summary proceeding so as to bring about a speedy recovery without long drawn out litigation. Appeals have been limited to questions of law, leaving in the hands of the Industrial Board the final decision on all questions of fact. The questions that have come to the appellate courts for decision may be classified under two general headings: first, questions covering constitutional points; and second, relating to the scope of the act.

As to the first; it is not necessary for me to remind you that in the early years of agitation for workmen's compensation laws the courts did not look favorably upon a scheme designed to abolish the time-honored common law defences, and to substitute therefor a principle of recovery based on "liability without fault". It is not surprising that the courts should have taken that position. As the traditional conservators of the rights of persons and the rights of property, judges and lawyers are apt to cling longer to established institutions than any other class of men. The *Ives* case went so far as to label the new principle as revolutionary. The result of that case is well known. It brought about not only an amendment to the constitution of the state, but the fear of the influence of that decision caused a number of other states to adopt elective forms of compensation. After all, this fear was unfounded.

A comparatively short time thereafter the United States Supreme Court in the *White* case expressed its complete disagreement with the decision of the New York Court of Appeals in the *Ives* case; not only was the constitutionality of the New York Compensation Law upheld, but the court went so far as to declare that "liability without fault" was not a novelty to the common law, and that the states had a right to alter the common law rules by the substitution of any other reasonable system that would do substantial justice to workmen injured in industrial pursuits. In the language of the court:

"The close relation of the rules regarding responsibility as between employer and employee with the fundamental rights of liberty and property is of course recognized. These rules as

guides of conduct are not beyond alteration by legislation in the public interest. No person has a vested interest in any rule of law entitling him to insist that it shall remain unchanged for his benefit. Much emphasis is laid upon the criticism that the act creates liability without fault. This is sufficiently answered by what has been said, but we may add that liability without fault is not a novelty in the law. The common law liability of the carrier, of the inn-keeper, of him who employed fire or other dangerous agency or harbored a mischievous animal was not dependent altogether upon questions of fault or negligence. (New York Central v. White, 243 U. S. 188; Mar. 6, 1917.)"

At the same time the court upheld the workmen's compensation act of Washington,<sup>4</sup> a statute radically differing from the New York law. The Washington law makes the state the sole agency for compensation insurance, creating a special fund through an occupational tax. It was held that the act constitutes a fair and reasonable exercise of governmental power, and that the authority of the states to enact such laws as reasonably are deemed to be necessary to promote the health, safety and general welfare of their people carries with it a wide range of judgment and discretion as to what matters are of sufficiently general importance to be subjected to state regulation and administration.

In the contest involving the constitutionality of the Arizona act,<sup>5</sup> it was held that it is for the state to determine the question whether an award for compensation to injured workmen shall be measured as compensatory damages are measured at common law, or according to some prescribed scale reasonably adapted to produce a fair result.

And the courts sustained also the elective compensation act of Iowa.<sup>6</sup>

Here we have four statutes radically differing as to special features and modes of arriving at a common result. All of them were contested on the ground that the legislature had exceeded its authority, depriving the appellants of property under the "due process" clause of the Fourteenth Amendment; we find the objections in all four answered and overruled, the court

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4. Mountain Timber Company v. Washington, 243 U. S. 219, Mar. 6, 1917.

5. Arizona Employers' Liability cases, 250 U. S. 400.

6. Hawkins v. Bleakley, 243 U. S. 210, Mar. 6, 1917.

employing the process of reasoning and language similar to that used by advocates who have for years urged the new principle insisting that the common law rules were obsolete and no longer in agreement with the industrial conditions of modern society.

In Ohio the constitutional question assumed a special aspect. The Ohio law<sup>7</sup> goes so far as not only to restrict insurance to a state insurance fund, but also forbids self-insurers to reinsure their liability with any private insurance company. The United States Supreme Court sustained these restrictions and inhibitions.

The New York Act, which defines certain employments as hazardous under a special group arrangement, has been amended in 1918 so as to provide that any employment not specifically named in the groups, but which has in its employ four or more workmen or operatives regularly, is to be classified in its entirety as subject to the compensation law.

The constitutionality of this amendment has been also sustained,<sup>8</sup> as was the amendment introduced in 1916 permitting the Industrial Board to make proper and equitable awards for serious facial or head disfigurement.<sup>9</sup> These decisions on constitutional points may be properly designated as liberal in that the courts have shown a disposition to favor the compensation principle as a proper exercise of the police powers of the state.

An exception to this point of view may be taken in connection with decisions that deal with maritime injuries. Here emphasis is given to the conflict between state and federal jurisdiction, the courts nullifying several attempts to bring certain classes of workmen such as longshoremen within the purview of the compensation law. The status of this class has been uncertain throughout the history of compensation. In the *Jensen* case<sup>10</sup> which reached the Supreme Court in 1917, it was declared that Congress had the sole and paramount power to fix and determine the maritime law which shall prevail throughout the country. Following this decision, Congress amended the Judicial Code so as to give to maritime workers an election of remedies, allowing recovery at common law or at admiralty.

7. *Thornton v. Duffy*, 254 U. S. 361, Dec. 20, 1920.

8. *Ward & Gow v. Krinsky*, 259 U. S. 503, June 5, 1922.

9. *New York Central v. Blanc*, 250 U. S. 596, Nov. 10, 1919.

10. *Southern Pacific Co. v. Jensen*, 244 U. S. 205, May 21, 1917.

This amendment was declared unconstitutional in July 1920.<sup>11</sup> It was held that since the beginning of our laws our federal courts have recognized and applied the rules and principles of maritime law as something distinct from the laws in the several states; that it was not the intention of the framers of the constitution to place the rules and limits of maritime law under the disposal and regulation of the several states, and that a departure from the rule might carry as a consequence the destruction to uniformity in respect to maritime matters which the constitution was designed to establish.

A further attempt to amend the Judicial Code in 1922 so as to give the compensation remedy to semi-maritime workers was also ruled out by the court as unconstitutional in a decision handed down in February 1924 involving two cases, viz. *State of Washington v. Dawson* and *California Industrial Accident Commission v. Rolph*.<sup>12</sup> The dissenting opinion by Mr. Justice Brandeis brings out very clearly the argument in favor of recognizing the jurisdiction of the state laws for the benefit of workers who are not exclusively engaged in maritime occupations and who may meet with injuries on vessels in navigable waters as an incident to ordinary land occupations.

On leaving the field of constitutional questions, we enter the domain of cases dealing with interpretations affecting the scope of the act. In the early days the courts debated with great intensity the question as to whether a particular employee was within or without the act. This was due mainly to the caution of a coterie of impractical social theorists who persuaded the legislature to classify employees in groups according to occupations, labeling such occupations as hazardous. This idea was prompted in part by a selfish desire to protect the skilled trades to the exclusion of the "white collar men" and in part by the feeling that the courts would be less likely to interfere with legislation restricted to the protection of men in hazardous work. Eventually the law was amended by changing several definitions relating to employments. Prior to such change we meet with cases involving serious discussions on matters that would now be answered offhand by unanimous decision without opinion.

11. *Knickerbocker Ice Co. v. Stewart*, 226 N. Y. 302, May 17, 1920.

12. *State of Washington v. Dawson* and *California Industrial Accident Commission v. Rolph*, 44 U. S. 302, Feb. 25, 1924.

Thus for example: In *Larsen v. Paine Drug Co.*,<sup>13</sup> the employer was engaged in the manufacture of drugs and chemicals. The injured employee was a porter, elevator and handy man and at the time of the accident was putting up a small shelf at the foot of the elevator and lost his balance and fell down the elevator shaft. The award was contested on the ground that the employee did not take any part in the actual manufacture of drugs and chemicals. The court sustained the award on the ground that his work was incidental to the employment.

In *Bargey v. Massaro Macaroni Co.*,<sup>14</sup> Bargey, a carpenter, was killed while putting up a partition for the defendant, a corporation engaged in the manufacture of macaroni. The company used part of the building for a factory and leased part of it for a saloon. The carpenter was told to put up a partition in the saloon. The court ruled that the work had no relation to the hazardous employment of manufacturing macaroni, and that the carpenter was not an employee within the meaning of the law.

The question as to whether the remedy given by the compensation law is exclusive of all other remedies, was first raised in the case of *Shinnick v. Clover Farms*.<sup>15</sup> The action was brought under the Employers' Liability Act. The claimant was injured by a vicious horse. The horse attacked and bit the plaintiff in the left ear as a consequence of which the plaintiff suffered permanent injuries. Part of the ear had to be amputated. The defendant by way of demurrer contended that the compensation law is an exclusive remedy and that an action for damages based on negligence could not be sustained. The demurrer was overruled, the court sustaining the plaintiff on the ground that the schedules in the Compensation Act did not cover the injury suffered by the employees. It was held that the claim was not within the purview of the act.

"The act provides no scale or gauge by which to determine what compensation should be provided. As to such an injury, therefore, the right to recover remains as it was before the act was passed. The schedules of the law cover with considerable detail a great number of injuries such as frequently result from accident in industrial pursuits and such as tend to impair temporarily or permanently, wholly or partially, the ability of the injured

13. *Larsen v. Paine Drug Co.*, 218 N. Y. 252, May 12, 1916.

14. *Bargey v. Massaro Macaroni Co.*, 218 N. Y. 410, June 16, 1916.

15. *Shinnick v. Clover Farms*, 169 App. Div. 236, July 9, 1915.

employee to pursue his avocation, but there is no mention in the schedules to the injury to or the loss of part of an ear. True, there is a special paragraph covering 'All Other Cases' in this class of disability, but an injury to the ear is not of the same class of disability as those specified in the schedules."

The conclusion is to the effect that the plaintiff is not covered by the workmen's compensation law and that the complaint states a good cause of action. The decision in this case caused considerable anxiety to insurance underwriters because of possible damage suits to which it might give rise. It was particularly disturbing to the managers of the State Insurance Fund for the reason that the State Fund limits its cover to workmen's compensation losses. If that decision had prevailed as law, the door would be open to liability suits against which the State Fund policies do not offer suitable protection. The decision, however, was not only modified in a subsequent case<sup>16</sup>, but the law was also amended so as to define compensation more clearly as the exclusive remedy. In *Shanahan v. Monarch Engineering Co.*, the Court of Appeals takes issue with the decision in the *Shinnick* case and virtually overrules it. Here the plaintiff sought to recover damages for the benefit of the next of kin. He left no widow or next of kin meeting the description of those entitled to compensation under the act. His next of kin in whose behalf the action was brought were adult brothers and sisters who are not entitled to compensation under the act. The court held that the action could not be sustained. Brothers and sisters as a class and as proper next of kin to be considered under the compensation law, were not overlooked, but were provided for under certain conditions in case they are under eighteen years of age and dependents. The same condition with respect to age was observed in the case of children, those under the age of eighteen years being entitled to the benefits of the act, and those over that age not being entitled to the benefits. The court was not unanimous, Judges Bartlett and Chase dissenting.

Accidents on the way to and from work present doubtful questions of law as to whether they come within the scope of the act under the definition "arising out of and in the course of employment".

16. *Shanahan v. Monarch Engineering Co.*, 219 N. Y. 469, Dec. 29, 1916.



In *Pierson v. Interborough Rapid Transit Co.*,<sup>17</sup> the plaintiff was employed by defendant as a guard on its elevated railway. He had been on duty for several hours, finished his trip at the terminal, and was off duty on what is known as a "swing" of about two hours. His time was at his disposal for that period. He was in the company's uniform and instead of leaving the train and the premises of the defendant he remained upon the same train when it started on its southerly trip. His purpose in taking the trip was to go to his dentist's on 59th Street, but it was his intention to stop off the train at 129th Street where the employees receive their pay and if there were not too many in line, to collect his pay. After the train had left the terminal and before reaching 129th Street it came into collision with another train on the same track and plaintiff sustained the injuries for which the damages were awarded. The court held that the accident did not come within the compensation act. This case, however, is an illustration of the fact that a decision excluding compensation as a remedy does not necessarily have an adverse effect upon the claimant. The suit for damages resulting in a verdict of \$20,000 was sustained on the theory that the plaintiff was a passenger and not an employee.

In *Urban v. Topping Bros.*,<sup>18</sup> the decedent had finished his employment, which was assistant order clerk in a wholesale hardware business, laying out goods on order. He had washed up, put on his coat and hat and gone to the door to go out. It was 5:35. His quitting time was 5:30. Remembering that the companions with whom he usually went home were still there he returned; not finding them in the room upstairs, he thrust his head in the elevator shaft and called to them. The descending elevator crushed his head. The court held that at the time he met his death he was not engaged in the business of his employment. He had ceased that. His act of turning back, looking about the room for his companions, and putting his head into the elevator shaft was his own voluntary act. He had deviated from the direct and ordinary route of passage for purposes of his own. Compensation was denied.

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17. *Pierson v. Interborough Rapid Transit Co.*, 184 App. Div. 678, Nov. 8, 1918.

18. *Urban v. Topping Bros.*, 184 App. Div. 633, Nov. 13, 1918.

In *McInerney v. Buffalo & Susquehanna Railroad Corporation*,<sup>19</sup> the employee had quit work and had traveled considerably more than a half a mile upon the railroad's right of way before he met with the accident. The Appellate Division affirmed an award to the widow unanimously and without opinion. This was reversed in the Court of Appeals. The facts are stated in the opinion.

"The fact that an employee is on the premises of his employer when those premises consist of a railroad right of way or yards does not have the significance which it naturally would have in the case of an ordinary manufacturing plant. . . . such rights of way extend indefinitely. . . . such yards are of no standard size but run from small areas to large tracts extending over many miles. Tested by the general character of the undertaking in which the deceased was engaged at the time of the accident, the latter did not arise in the course of or spring out of his employment. The deceased workman was in the employ of the defendant as a car inspector in one of his yards. He was accustomed to go for his dinner to his home which was not on the defendant's premises, on weekdays taking the highway and on Sundays walking on the railroad right of way in order to avoid exposing himself in his working clothes to the view of people on the highway. On Sundays he received pay for eleven hours which included the one which he was permitted to take for dinner. On the day in question, which was Sunday, as he was thus going to dinner he received injuries causing death by falling from a trestle which was within the limits of the railroad yards in which yard he performed certain of his duties. Such a trip of an employee as he was taking is not under ordinary circumstances part of the employment."

The court draws a distinction between this case and others where an employer requests or customarily permits his employees to eat their meals upon his premises or in some place provided for them. In those cases the temporary interruption to their work thus caused will not be regarded as terminating their character as employees or as excluding them from the protection of the compensation law.

It may be of interest to compare these decisions with *Cudahy Packing Co. v. Parramore*, decided December 10, 1923 and which reached the United States Supreme Court on a writ of error from a decision by the Supreme Court of the State of Utah. In this case the injured was crossing a railroad track on a public road a half mile from the plant seven minutes before he was due there.

19. *McInerney v. Buffalo & Susquehanna Railroad Corporation*, 225 N. Y. 130, Jan. 7, 1919.

He was killed by a train. The road offered the only public approach to the plant. The Supreme Court of the State of Utah affirmed the award. The United States Supreme Court in sustaining the State Court held:

“That the liability is based not upon any act or omission of the employer but upon the existence of the relationship which the employee bears to the employment, and it is enough if there be a casual connection between the injury and the business in which he is employed. 263 U. S. 418.”

The contractual status of the employee has given rise to a number of decisions dealing with the question as to whether he is a servant or an independent contractor. In general, the courts have retained the common law distinction as between an employee and an independent contractor. The decision in each case depends on the terms and conditions of employment and the extent of control and supervision exercised by the employer.

In *Dose v. Moehle Lithographic Company*,<sup>20</sup> Dose, a bricklayer, was employed by the defendant company to point up one of the walls of its plant and repair cracks wherein he and his helper were to be paid the regular wages for bricklayers and bricklayers' helpers. The company furnished all materials, ladders and supplies. While so employed, Dose fell from the scaffold. He received injuries for which an award was made by the Commission. The award was reversed by the Appellate Division. The Court of Appeals held that Dose was engaged in an employment incidental and requisite to the business carried on by the company and under the latter was clearly entitled to compensation.

In *McNally v. Diamond Mills Paper Co.*,<sup>21</sup> the plaintiff under order from the Erie City Iron Works undertook to move an engine from the railroad to the paper mill for a fixed sum. After that contract had been fully performed he was asked by one of the officers of the paper mill to assist in the work of installation. He was to be paid by day's labor, and he brought with him two of his own hired men and his own blocking, rigging and jacks. Two of the permanent employees of the mill and two others hired for the job, worked with him. In charge of them all was an

20. *Dose v. Moehle Lithographic Company*, 221 N. Y. 401, Oct. 23, 1917.

21. *McNally v. Diamond Mills Paper Co.*, 223 N. Y. 83, Mar. 12, 1918.

engineer, superintending the installation on behalf of the Erie City Iron Works. In the course of work McNally hurt his arm. The Commission made an award which was reversed by the Appellate Division. The Court of Appeals held that McNally was an employee and that the work he was doing was incidental to the business of the paper mill, and rendered a decision affirming the award.

In *Feck v. Schomske*,<sup>22</sup> an eleven year old school boy who was assisting a milkman on Saturday school holidays, receiving for the help thus given a dime on Saturday night, slipped and fell on a wheel of the wagon which crushed his ankle. His leg was amputated below the knee. The Commission concluded that he came within the definition of employee and made an award which was sustained by the Appellate Division unanimously and without opinion.

In *Litts v. Risley Lumber Co.*,<sup>23</sup> the award was contested on the ground that the deceased was an independent contractor and that he was to be paid a certain lump sum for his services. The employer furnished the material with which the painting was to be done, and the deceased was not expected to employ anyone, the necessary help being furnished by the employer. The Commission held that the mere fact of a lump sum agreement being made instead of day's wages does not take the workman out of the class of an employee within the meaning of the compensation law. An award made in the case was sustained by the Appellate Division but reversed by the Court of Appeals. Said the court:

"In the instant case Litts was an independent contractor. He agreed to do a specific piece of work for the company. In doing it he had absolute control of himself and his helper. He was independent as to when, within a reasonable time after the agreement was made between him and the company and as to where he should commence the work. He was free to proceed in the execution of it entirely in accordance with his own ideas. He was not to any extent subject to the directions of the company in respect of the method, means or procedure in the accomplishment. He was not subject to a discharge by the company because he did the painting in one way rather than in another. Those facts, considered by themselves, would constitute him an independent contractor. In the relation of employer and employee the employer has control and direction not only of the work or performance and its

22. *Feck v. Schomske*, 184 App. Div. 922, May 21, 1918.

23. *Litts v. Risley Lumber Co.*, 224 N. Y. 321, Oct. 29, 1918.

result, but of its details and method and may discharge the employee disobeying such control and direction."

Of the definition of employee in the workmen's compensation law, the court said:

"This definition is not inimical to and does not disturb the distinctions established in the common law between a servant or employee and an independent contractor. The rules which demarcated the relation of master and servant from that of employer and independent contractor are operative in the consideration of claims made under the act. From the definitions and language of the act it is manifest that it deals with employers and employees, and an independent contractor is not within its protection."

In *Farrington v. United States Railroad Administration*,<sup>24</sup> a station agent not being able to close the door of a freight car called upon a bystander to help him. The bystander responding, cut and injured his finger. Tetanus developed, causing his death. The Commission held that the bystander was a temporary employee and awarded death benefits to the widow against the station agent's employer. The award was affirmed by the Appellate Division, Justice H. T. Kellogg dissenting.

In *Mandatto v. Hudson Shoring Co.*,<sup>25</sup> two special contractors were working upon the same building. One of them called upon the other for the services of himself and his derrick and gas engine to hoist a large timber or beam. The contractor so called upon having hurt his foot while doing the work, the Commission held that he stood in the relation of employee to the contractor for whom the work was being done. It awarded compensation accordingly and was sustained by the Appellate Division. The Court divided, Justice H. T. Kellogg dissenting.

The New York law extends its arms of protection to workers who are sent on industrial errands outside of the state. The leading cases on the subject are given below. The principle seems to be that an employer engaged in operations in New York and employing labor in the state, brings all of his employees within the scope of the act regardless of whether their work is performed within or without the state. Under this rule a foreign employer who hires labor in New York but does not conduct

24. *Farrington v. United States Railroad Administration*, App. Div. 189, Dec. 29, 1919.

25. *Mandatto v. Hudson Shoring Co.*, 190 App. Div. 71, Dec. 29, 1919.

operations in New York does not come within the scope of the act. As a collateral feature of the rule, a workman from another state who is sent to New York and is injured in his pursuit in this state may recover compensation on the basis of the schedule provided by the law of his home state.

In *Post v. Burger & Gohlke*,<sup>26</sup> the plaintiff was engaged as a sheet metal worker for the defendant corporation. The contract of employment was made in the state of New York. On September 1, 1914, the employee was sent to perform certain sheet metal work on a grain elevator in Jersey City, and while engaged in his work on that day a sheet of metal slipped from his hands and he received an injury to his wrist. The Commission made an award which was confirmed by the Appellate Division. The question on appeal in the New York Court of Appeals involved the point as to whether the employee, having received his injuries in the state of New Jersey was entitled to compensation under the New York law. The court directs attention to two important provisions which must constantly be borne in mind as they affect and characterize all the other provisions of the act.

1. In the absence of substantial evidence to the contrary, it must be presumed that the claim comes within the provisions of the act. 2. The liability of the employer for compensation includes every accidental personal injury sustained by the employee arising out of and in the course of employment.

The award was sustained on the following grounds:

If the claimant were only entitled to recover compensation for his injuries as for a tort, the general rule that an act of the legislature, unless otherwise shown, is not intended to apply outside of the boundaries of the state, would have been applicable, but in the case at bar it was the intention of the legislature that every contract of employment should be read as though it included the provisions of the act, and the parties are bound without reference to the place where the injury occurs. The cost of insurance is determined by ascertaining the number of all the employees of the employer and the wages paid to them. There is no provision in the act for ascertaining the number of employees of an employer engaged within the state nor is there any deduction from the amount to be paid for state or other insurance by reason of the fact that a portion of the employees may be engaged outside of the boundaries of the state.

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26. *Post v. Burger & Gohlke*, 216 N. Y. 544, Jan. 11, 1916.

In *Smith v. Heine Safety Boiler Co.*,<sup>27</sup> the defendant is a Missouri corporation having factories in Missouri. Smith entered the service under a contract of employment which was made in New York. Smith was a traveling engineer. Some years before the accident the engineering office was moved to Phoenixville, Pa., and all that was left in New York was a selling agency. In 1916 Mr. Smith was sent from Pennsylvania to Biddeford, Maine to install a boiler, and while working there was killed.

The court held that the operations of the employer consisting mainly of the selling agency was not subject to the act; it had no obligation to insure, and the employer was not liable as for a compensable accident.

In *Perles v. Lederer*,<sup>28</sup> plaintiff was to perform duties of a waitress in a summer hotel in Forest Park, Pa. Contract of hire was made through an agent of an employment office in the City of New York. She was injured in a laundry connected with the hotel. The Commission made an award. This was reversed by the Appellate Division on the authority of *Smith v. Heine Safety Boiler Co.*

If an employee regularly employed in New Jersey and entitled to compensation for accidental injury under the New Jersey law is sent by his employer into New York and incurs an injury in New York, the New York courts will sustain the New Jersey Compensation Law to the exclusion of an action of the employee against his employer for negligence.<sup>29</sup>

A resident of Sheldon, Iowa, came to Rochester and entered into a contract of employment as a traveling salesman for a company having a factory at Rochester. The contract was executed in the company's office. The employee worked at the plant about ten days to get acquainted with the business. He then departed for his territory in the West. While traveling in an automobile in Missouri, the machine skidded and fatally injured him. His employer was paying for the use of the automobile. An award by the Commission was affirmed by the Appellate Division.<sup>30</sup>

An employer with a main office in New York City sent a

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27. *Smith v. Heine Safety Boiler Co.*, 224 N. Y. 9, May 28, 1918.

28. *Perles v. Lederer*, 189 App. Div. 425, Nov. 21, 1919.

29. *Barnhart v. American Concrete Steel Co.*, 227 N. Y. 531, Jan. 6, 1920.

30. *Hospers v. Hungerford-Smith Co.*, 194 App. Div. 945, Nov. 10, 1920.

plasterer to work upon a building in New Britain, Connecticut. An award for hernia was affirmed.<sup>31</sup>

In a series of cases beginning with *Fiocca v. Dillon*<sup>32</sup>, home workers are definitely construed to come within the act.<sup>33</sup>

Compensable injuries are defined in the law as "accidental injuries arising out of and in the course of employment and such disease or infection as may naturally and unavoidably result therefrom." The cases selected under this heading illustrate for one thing the paucity of human language to express in satisfactory form of statutory law, ideas and concepts sufficiently definite to remove all reasonable doubt on the part of intelligent men accustomed to interpret and apply law to a given state of facts. Is the particular injury accidental? Is there a causal connection between the accident and injury? We have variable answers to these questions in the appellate courts. In the leading cases we are confronted with reversals of the court below, and with dissenting opinions in both appellate courts.

In *Days v. Trimmer & Sons*,<sup>34</sup> frost bite was held to be an accident and compensable. Similarly, vertigo, nervous breakdown and strain were classed within the definition of accidental injury.

In *Hernon v. Holihan*, decided by the Appellate Division on March 6, 1918, sunstroke was construed to be an accident compensable under the law.

In *Kelly v. States Metal Co.*,<sup>35</sup> the court affirmed an award to the widow unanimously and without opinion. This is a case where a laborer employed by a firm in manufacture of metallic salts was overcome by fumes while cleaning one of its tanks, and as a result died of degenerate changes of liver and kidneys.

In *O'Dell v. Adirondack Electric Power Corp.*,<sup>36</sup> a workman stringing wires in a cellar was partly overcome by coal gas and steam; congestion of his lungs led to tuberculosis and upon his

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31. *Francavilla v. Mitchell*, 231 N. Y. Rep. 510, Mar. 22, 1921.

32. *Fiocca v. Dillon*, 175 App. Div. 957, Nov. 15, 1916.

33. See also *Liberatore v. Friedman*, 224 N. Y. Rep. 710, Nov. 26, 1918, and *Allied Mutuals v. DeJong*, 205 N. Y. S. 165.

34. *Days v. Trimmer & Sons*, 176 App. Div. 124, Dec. 28, 1916.

35. *Kelly v. States Metals Co.*, 184 App. Div. 918, May 8, 1918.

36. *O'Dell v. Adirondack Electric Power Corp.*, 223 N. Y. Rep. 686, May 14, 1918.



death from the disease, the court affirmed an award to his widow unanimously and without opinion.

In *Brockelbank v. Funk*,<sup>37</sup> the court sustains an award for sun-stroke suffered by a driver's helper upon the ground that the employer had kept the deceased employee at his employment after he had complained of the heat.

In *Mahoney v. Troy Gas Co.*,<sup>38</sup> a laborer for a gas company inhaled illuminating gas while repairing a leaking pipe in a cellar. The undue strain upon his heart caused death within a few hours. The court affirmed an award to dependents unanimously and without opinion.

In *Keenan v. Roosen Co.*,<sup>39</sup> a laborer in the color department of a factory manufacturing printers' ink and colors worked on a balcony over a 300 gallon tank of "bronze blue." Acid fumes from the tank aggravated pneumonia that he had, either in dormant or developing state and caused his death within two days. The court affirmed an award for dependents unanimously and without opinion.

In *Richardson v. Greenberg*,<sup>40</sup> the workman was employed as a stableman. While so employed he was required to lead a horse affected with glanders through the streets of the city of New York. During this journey he contracted glanders. The disease was contracted through the inhalation of the bacteria. He died fourteen days thereafter. The Commission made an award which was reversed by the Appellate Division. The court divided on the question as to whether the case came within the definition of accidental injury and disease. The majority opinion was to the effect that a disease contracted without previous accidental injury occurring in the course of employment cannot be classed within the workmen's compensation law of this state as an accidental injury arising out of and in the course of employment. The minority opinion expressed the view that it was erroneous to assume that the workmen's compensation law applies only where an accident is shown. The amendment to the Constitution upon which the workmen's compensation law rests was not to limit cases of compensation to accident. The

37. *Brockelbank v. Funk*, 186 App. Div. 924, Nov. 13, 1918.

38. *Mahoney v. Troy Gas Co.*, 186 App. Div. 924, Nov. 13, 1918.

39. *Keenan v. Roosen Co.*, 187 App. Div. 962, Mar. 5, 1919.

40. *Richardson v. Greenberg*, 188 App. Div. 248, May 19, 1919.

legislature may award compensation for an injury resulting from the employment—and so in this case the germs did not knock the employee down or break his jaw—but concededly they caused his death. The death occurring from a risk of the employment, it is better to rest upon the ordinary presumption in favor of the claim than to resort to fine spun theories to destroy it. A disease or infection naturally and unavoidably resulting from the employment is compensable under the statute.

In *Swanson v. Doehler Die Casting Co.*,<sup>41</sup> a woman employee was making die castings. Some filings flew into her eye. The Commission found that resulting ulceration lighted up latent blood conditions which in turn clouded the cornea. The award of the Commission was reversed and the claim dismissed for lack of causal relation between the accident and disability.

In *Pinto v. Chelsea Fibre Mills*, decided March 2, 1921, a bobbin boy in a factory went to the nurse in the emergency room and complained of his eye. She put some drops in it. A corneal ulcer developed. The Commission found that particles of dust from a machine had entered the eye; that the boy had rubbed it; that the dust had caused the ulcer; that resulting opacity amounted to a ninety per cent. loss of vision. Compensation was awarded. The Appellate Division reversed the award and dismissed the claim on the ground that there was no probative evidence either of an accident or of causation of the ulcer by dust.

In *Connelly v. Hunt Furniture Co. et al.*,<sup>42</sup> we have a gruesome statement of facts. Claimant's son, Harry Connelly, was employed by an undertaker as an embalmer's helper. In the line of his duty, he handled a corpse, which by reason of the amputation of a leg had become greatly decayed and was full of gangrenous matter. Some of this matter entered a little cut in his hand, and later spread to his neck when he scratched a pimple with the infected finger. General blood poisoning set in, and caused his death. His dependent mother obtained an award for death benefits. The Appellate Division reversed and dismissed the claim. The Court of Appeals by a vote of four to three affirmed the award on the ground that the disease which caused death was due to an accidental injury arising out of and in the course of

41. *Swanson v. Doehler Die Casting Co.*, 191 App. Div. 930, Mar. 3, 1920.

42. *Connelly v. Hunt Furniture Co. et al.*, 240 N. Y. 83, Mar. 1925.

employment. The opinion presents an interesting discussion on accidental injuries and resulting infections.

"A trifling scratch was turned into a deadly wound by contact with a poisonous substance. We think the injection of the poison was itself an accidental injury within the meaning of the statute. More than this, the contact had its occasion in the performance of the servant's duties. There was thus not merely an accident but one due to the employment. We attempt no scientifically exact discrimination between accident and disease or between disease and injury. None perhaps is possible, for the two concepts are not always exclusive, the one of the other, but often overlap. The tests to be applied are those of common understanding as revealed in common speech.....

"If Connelly's death was the outcome of an accident, as we think indisputably it was, only a strained and artificial terminology would refuse to identify the accident with the pernicious contact and its incidents, and confine that description to the scratch or the abrasion, which had an origin unknown. On the contrary, when a scratch or abrasion is of itself trivial or innocent, the average thought, if driven to a choice between the successive phases of the casualty, would find the larger measure of misadventure in the poisonous infection. The choice, however, is one that is needless and misleading. The whole group of events, beginning with the cut and ending with death, was an accident not in one of its phases, but in all of them. If any of those phases had its origin in causes engendered by the employment, the act supplies a remedy.....

"The point is made that infection is here coupled with disease as something other than an accident or an injury, though a possible concomitant. We think the intention was by the addition of these words to enlarge and not to narrow. Infection, like disease, may be gradual and insidious, or sudden and catastrophic. It may be an aggravation of injuries sustained in the course of the employment and arising therefrom, in which event it enters into the award though its own immediate cause was unrelated to the service. It may be an aggravation of injuries which in their origin or primary form were apart from the employment, in which event, if sudden and catastrophic and an incident of service, it will supply a new point of departure, a new starting point in the chain of causes, and be reckoned in measuring the award as an injury itself."

A very good idea of the attitude of the appellate courts may be gained by studying cases dealing with decisions that relate to the schedule of benefits. These decisions are important because here the courts are called upon to regulate the amount of compensation, depending upon the extent and nature of the injury. The

very first case that has come to the attention of the Court of Appeals involved the question as to whether an accident which resulted in amputation of part of the first phalange of the third finger was subject to an award for the loss of the entire phalange. Here the court goes on record in denying the appellant's plea for a strict construction of the statute as derogatory to the common law.<sup>43</sup>

In the *Matter of Petrie*,<sup>44</sup> the claimant who was in the employ of the Oneida Steel Pulley Company, met with an accident which among other things resulted in injury to, and subsequent amputation of part of the first phalange of his third finger, and award was made as for the loss of the entire phalange of the finger.

Section 15 of the law provides that the loss of the first phalange shall be considered to be equal to the loss of one-half of the finger, and the loss of more than one phalange shall be considered as the loss of the entire finger. There is also general provision that in all other cases in this class of disability, compensation shall be at a certain rate fixed in the section. The award was contested on the ground that it should have been made under the general clause providing for "All Other Cases", and that compensation for the loss of a phalange can be awarded only in cases where the entire phalange has been lost. The court held that the findings of the Commission were somewhat contradictory and rather unsatisfactory in that they state in one place, that the amputation of the phalange occurred near the first joint, and in another place, that about one-third of the bone of the distal phalange was cut off. Construed together and in the light of the evidence, it may be regarded as stating that the substantial part of the phalange was cut off. On the above theory, the award was sustained.

The reasoning of the court is of interest. The workmen's compensation law was adopted in deference to a wide-spread belief and demand that compensation should be awarded to workmen who were injured and disabled temporarily or permanently in the course of their employment, even though sometimes the accident might occur under such circumstances as would not permit a recovery in the ordinary action of law. The underlying thought was that such a system of compensation would be in the

43. Waite—Columbia Law Review, Feb. 1925, p. 137.

44. *Matter of Petrie*, 216 N. Y. 116, June 16, 1916.

interest of the general welfare by preventing a workman from being deprived of means of support as the result of an injury received in the course of employment. The statute was the expression of what was regarded by the legislature as a wise public policy concerning injured employees. Under such circumstances it is to be interpreted with fair *liberality*, to the end of securing the benefits which it was intended to accomplish. Applying these rules to what happens to be in this case an accident of minor importance, the provisions of the statute providing compensation for the loss of a certain portion of the finger become operative and applicable when it appears that substantially all the portion of the finger so designated has been lost and that such provisions should not be interpreted too narrowly for the purpose of defeating a recovery.

The opinion contains a reservation to the effect that the loss of part of the distal phalange of a finger might be so slight as not to constitute loss of one-half of the finger. Acting on this reservation, the Appellate Division set aside an award for loss of one-half of a finger on the ground that the loss had amounted to only the merest shaving of bone. Said the court: "A liberal interpretation should not go to the extent of becoming an absurd interpretation."<sup>45</sup>

In *Grammici v. Zinn*,<sup>46</sup> the case involved the amputation of claimant's first, second and third fingers and the first phalange of the fourth finger of his right hand. The appellants submitted evidence tending to prove that neither the hand nor the use of it was lost. There was no substantial contradiction of this evidence. The court held:

"That the expressions 'loss' and 'loss of the use' as used in the law, should be given their unrestricted and ordinary meaning. In the case at bar, the hand, or the use of it, was not lost, provided it could fulfill, in a degree fair and worth considering, in any employment for which the claimant was physically and mentally fitted or adaptive, its normal and natural functions. In case the hand was destroyed by amputation, directly or indirectly caused by the injuries, to such an extent that it could not thus fulfill its natural functions, it was, within the purview of the law, lost. While the loss of a hand necessarily involves the loss of the use of it, the loss of the use of

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45. *Mockler v. Hawkes*, 173 App. Div. 333, May 3, 1916.

46. *Grammici v. Zinn*, 219 N. Y. 322, Nov. 28, 1916.

a hand does not involve the actual loss of the hand as a physical member—a distinction the law recognizes and observes.”

The Commission allowed an award as for the loss of the hand, substituting this in place of a previous award of compensation for one hundred eight and one-half weeks. The Appellate Division reversed the decision. The original award was reinstated and affirmed.

The question as to the power of the courts in dealing with questions of fact crops up frequently in a number of cases. Section 20 of the New York law provides that the decision of the Industrial Board shall be final as to all questions of fact. In its commentaries on this provision, the court ruled that the Commission cannot act arbitrarily on the information it receives or in direct violation of the conceded facts. Its duty is to base its determination upon the undisputed facts of the case and the reasonable inferences to be drawn from the general situation. When its findings are without evidence and in direct conflict with the undisputed facts, and all reasonable inferences which may be drawn from them, its determination may be reversed as error of law.

In the case of *Rhyner v. Hueber Building Co.*,<sup>47</sup> the question raised was whether the Commission was correct in its finding that the beneficiary was a dependent. In sustaining the award it was held that where there is any evidence to support the finding of fact, the decision of the Commission is final and the court is not permitted to review.

“It is not well for this court to fall into the habit of discussing the facts, even for the purpose of showing that the findings of fact are reasonable and meet with our approbation. We cannot, except by usurpation, invade the realm of facts, for it was the clear intent of the legislature that the decision of the Commission shall be final as to all questions of fact! Of course, if there are no facts and the decision is arbitrary, unfair and unreasonable, a question of law arises and we may right the wrong. . . .

“The Commission is the sole judge and the final judge of the facts, and the court is not only forbidden to trespass upon the jurisdiction of the Commission in this field, but, by section 20 of the act, it is circumscribed, even, in its review of questions of law. It was the purpose of the legislature to create a tribunal to do rough justice, speedy, summary, informal, untechnical. With

47. *Rhyner v. Hueber Building Co.*, 171 App. Div. 56, Jan. 5, 1916.

this scheme of the legislature we must not interfere, for, if we trench in the slightest degree upon the prerogatives of the Commission, one encroachment will breed another, until finally simplicity will give way to complexity, and informality to technicality."

In *Kade v. Greenhut Co.*<sup>48</sup>, a saleswoman in a hardware store claimed that she had met with accidental injury while lifting some tubs. More than six months later she was operated upon for the removal of a diseased kidney. She died almost two years after the accident. The Commission made an award reversing previous conclusions after taking into consideration the opinion of a deputy commissioner who alleged that the claimant was an unusually healthy girl. The award was made on the ground that the diseased condition of the kidney was due to the accident. The doctor who performed the operation could not establish any causal relation between the accident and the condition which was demonstrated by the operation. The court held that it was its duty to determine whether there was evidence supporting or tending to sustain a finding of fact; that the alleged infection introduced two months after the alleged accident was not such an "infection as may naturally and unavoidably result" from a fall which merely bruises the person, and that the evidence was insufficient to serve as a foundation on which the verdict of a jury could rest. The award was reversed and the claim dismissed.

What conclusions can be drawn from this mass of decisions? Have the courts shown a disposition to be conservative or unduly liberal? Judgment on that point may be influenced by the particular interest of the critic. To generalize is unsafe, and yet if I were called upon to characterize the attitude of the courts I would be inclined to say that the courts were guided by conservative legal principles applied in a liberal spirit. The truth of the matter is that in these decisions there is visible a clash between two opposing ideas; the eighteenth century philosophy of individual rights seeking to impress its point of view upon twentieth century legislation. Directly and indirectly these decisions have had an enormous effect in reshaping the compensation law. We are accustomed to speak of the political and economic forces that had influenced the social

48. *Kade v. Greenhut Co.*, 193 App. Div. 862, Nov. 18, 1920.

concept of workmen's compensation. There is also the judicial influence. It may be too early to evaluate this element and perhaps impossible to express it in terms of mathematical formulae. But it would appear that workmen's compensation has opened a new field for judicial empiricism, for the development of new principles and their application to new situations, for experimentation with new forms of procedure and new methods for the trial of complicated questions of fact and law.

It is worth while to take a glimpse—even though it may be brief and hurried—into this laboratory of judicial lawmaking, to learn the process of reasoning and tendencies developed by the courts.

At first, constitutional questions were brought to the front and that involved a battle between two diametrically opposed forces: the individualistic ideals fortified by the "due process" clause and the growing social concept, expressed as "the police power of the state." The victory of the latter over the former is due in part to the changes that have taken place in industry, to the pressure of organized groups, and to the intensive propaganda conducted by social reformers. It is not surprising that the courts steeped in traditions of the common law should have been slow in yielding to the new social philosophy and slow in accepting it as part of the American jurisprudence. As it emerged from the hands of the legislature, the figure of the new goddess was blurred and indistinct. Now the mist is clearing away; the many puzzling questions have been answered. Home workers are under the protection of the law; also men who travel beyond the borders of the state. Compensable injuries arising out of employment are more clearly defined. Maritime workers are subject to the courts of admiralty. The compensation remedy is exclusive. The Board is the final judge on questions of fact, but findings of fact must be supported by legal evidence. The picture becomes clearer. The judicial lawmaker has been at work perfecting the crudities of early legislation.



THE STATISTICAL SURVEY OF THE MASSACHUSETTS  
COMMISSION INVESTIGATING THE QUESTION  
OF OLD AGE PENSIONS

BY

EDMUND S. COGSWELL

In recent years there has been a strong movement in several states looking toward the establishment of an old age pension law for the general population. Montana, Nevada, and Pennsylvania in 1923, and Wisconsin in 1925, passed such laws. In 1923 in the Massachusetts legislature there was a strong attempt made to pass an old age pension bill, and in order to determine how much such a law would cost, the legislature provided for the creation of a special commission to consider the problem and to estimate the cost. Former insurance commissioner Frank H. Hardison was chairman of this commission. The other members were Professor A. A. Young, Chairman of the Department of Economics at Harvard University, Mrs. William G. Dwight of Holyoke, Mr. C. J. Mahoney of Boston, and Mr. Royal Robbins of Brookline. The report was submitted Nov. 2, 1925.

The Wisconsin law of 1925 authorizes the counties to pay old age pensions to citizens of fifteen years' residence in the state, who have attained the age of seventy years. Persons who have property, either singly or with spouses, to the extent of \$3000 are ineligible. The amount of pension depends upon the income from other sources, but is limited to an amount sufficient to make the total income of the applicant \$1 a day. The Montana Act is somewhat similar, the main difference being that the maximum pension is \$25 per month. The Nevada Law of 1923 contained an age limit of 60 years which was raised to 65 years in the 1925 Nevada Act. The only other state passing an old age pension bill was Pennsylvania in 1923. This law was declared unconstitutional.

As bills before the Massachusetts legislature for many years have contained an age limit of 65, the Massachusetts Commission decided to secure facts concerning persons who had attained that age and arranged for the interviewing by field agents of about 10 per cent. of the residents who were not dependent on organized charity. This group has come to be known in old age pension investigations as "the non-dependent aged", although it should be understood that many in this group are aided by

children, relatives or friends. The Commission secured information about the persons 65 years of age and over aided by charity, which included 4123 almshouse inmates, 3791 recipients of public outdoor relief from public officials, 1471 recipients of outdoor relief from private charitable societies, and 2921 residents of private benevolent homes for the aged. The information about recipients of charity was secured for the year ending March 31, 1924, as the overseers of the poor by general law are required to report the names of persons aided to the State Department of Public Welfare for the year ending March 31. The Commission secured card forms for over 12,300 persons aided by charity.

Through field agents, the Commission secured information for about 19,000 persons (this figure includes some spouses under 65 years of age) who were not aided by charity, so that the total number of card schedules received exceeded 31,000.

The Commission found early in its investigation that of the estimated population 65 years of age and over, numbering 225,000, approximately 190,000 were not public military or civil pensioners\* nor did they receive support from public or private organized charity. About 9 per cent. of these non-dependent aged persons were interviewed by field agents. The preparation of card forms and the selection of towns and cities in which interviews were to be made, presented an interesting problem, particularly as the Commission's plan was to interview a much larger number of persons than had ever been done in any previous investigation in any one country or state. The plan in previous investigations such as were made in Massachusetts in 1907-10 and in Ohio and Pennsylvania in 1918, had been to interview only the middle or poorer classes. The Massachusetts Commission, however, desired to have full information which would be representative of the entire aged population of the state in order that a more complete estimate of the possible number of old age pensioners could be made, and accordingly arranged to interview nearly 20,000 persons 65 years of age and over in 10 cities and 23 towns, widely scattered. All

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\*The military pensioners were mostly Civil War veterans and their widows. Public pensioners with pensions of \$360 or over were considered ineligible to receive old age pensions and they were not included with the non-dependent aged.

persons 65 years of age and over listed by the assessors who could be located, even at the expense of repeated calls, were interviewed in the cities of Salem, Pittsfield, and Woburn and in the towns canvassed. Salem is the first city where such a thorough canvass of aged persons was ever made. The cities of Worcester, Fall River, Brockton, Lowell, and Springfield contained too many aged persons to make it possible for the Commission to interview every one, so in the cities of Lowell, Fall River, and Worcester, every fifth name on the assessors' list was checked for interviewing, and in Brockton every third name. In Springfield two wards said by city officials to be representative of the entire city, were canvassed. In Gloucester about one-half the wards of the city were covered. Boston, with its 26 wards and an aged population of 33,000, presented a problem. The field work of the Commission was first started in Boston and a few precincts supposed to be representative were first selected for the purpose of trying out card forms. In the other wards the precinct for interviewing was determined by lot. At least one precinct in each of the 26 wards was canvassed.

The 23 towns selected for interviewing were determined, having in mind geographical location, the industries, and size. The towns ranged in population from Florida, with 298 souls of all ages in its borders, to Arlington with a population of over 18,000 of all ages. About 10 per cent. of the population in each county was interviewed, the only county in which interviews were not made being the Island of Nantucket.

The names and ages of persons were secured from the printed or typewritten lists which the local assessors are required by general law to prepare each year, giving the names and ages of males and females 20 years of age and over. In addition, field agents in cities and towns where the entire aged population was to be interviewed, were asked to make inquiries in order to secure the names of persons who had been overlooked by the assessors. Most of the interviewing was performed in the late winter and spring of 1924. Space forbids a discussion of the drafting of card forms, the selection of field agents, and their instructions, but if any member of the Society should be faced with a similar problem in the future, the writer of this article would be pleased to give information secured in this regard which was based on actual experience.

While conditions varied from city to city and from town to town and the complete returns did not always bear out preconceived ideas, the Commission found that on the whole there was a considerable amount of stability in the figures, and that weighting them on any reasonable basis would not materially affect the total percentages. Consequently figures were combined without any weighting. The statistical tables prepared by the Commission give information which will be of assistance in computing the probable cost of an old age pension law.

The first statistical table in the Commission's report shows the composition of the aged population and shows very clearly that about five-sixths of the aged people are neither public pensioners nor recipients of organized charity.

TABLE I  
AGED POPULATION OF MASSACHUSETTS. 1924

Class	Persons 65 Years of Age and Over		Persons 70 Years of Age and Over	
	Number	Per cent.	Number	Per cent.
<b>Estimated Population—Total<sup>1</sup></b>	<b>225,000</b>	<b>100.0</b>	<b>133,000</b>	<b>100.0</b>
<i>Public Pensioners:</i>				
United States military pensioners <sup>2</sup> .....	15,000	6.7	13,500	10.2
Federal, state, county, city and town civil pensioners <sup>2</sup> .....	3,000	1.3	2,100	1.6
<i>Persons Aided by Organized charity:</i>				
Almshouse inmates.....	4,123	1.8	2,740	2.1
Aided by public charity in outdoor relief.....	3,791	1.7	2,655	2.0
Aided by private organized charity in outdoor relief (cases reported).....	1,471	.7	1,119	.8
Residents of private homes for the aged.....	2,921	1.3	2,492	1.9
Other recipients of relief.....	1,800	.8	1,250	.9
<i>Persons under custodial care:</i>				
In prisons, jails, etc.....	250	.1	90	.1
In state institutions for insane	2,750	1.2	1,660	1.2
<i>Persons not supported by public funds or by private organized charity (non-dependent aged)<sup>3</sup></i>	<b>189,894<sup>4</sup></b>	<b>84.4</b>	<b>105,394</b>	<b>79.2</b>

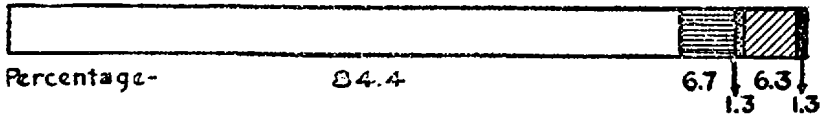
1. In this and following tables totals are placed at the top, following the practice of the Federal Bureau of the Census.

2. Including only those with pensions of \$360 or over.

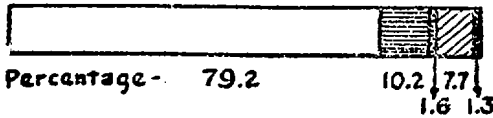
3. The large size of the non-dependent aged group, contrasted with the groups now receiving pensions, charity, or custodial care, is clearly evident from the chart on the following page.

4. The last 3 digits of this figure have no particular significance. They might have been rounded off, but were retained so that certain totals in the report would agree.

CHART I. GRAPHIC PRESENTATION OF TABLE I (PAGE 100)  
 COMPOSITION OF AGED POPULATION OF MASSACHUSETTS  
 PERSONS 65 YEARS OF AGE AND OVER



PERSONS 70 YEARS OF AGE AND OVER



LEGEND

- Non-dependent aged
- Civil pensioners
- Military pensioners
- Persons aided by charity
- Persons in custodial care

As the amount of old age pensions depends upon the financial condition of applicants, the Commission made a special effort to secure accurate information about the financial condition of persons 65 years of age and over. When the Commission's interviewing was first begun, it was not decided where the line of property qualification would be drawn, but all members of the Commission agreed that persons who possessed, either singly or with their spouses, property to the value of \$5000 or over were not in immediate need of old age pensions. Consequently very little detailed information was secured about these persons who were beyond any means qualification. The Commission's investigation, as will be noted from a reference to Tables II and III following, show that more than 40 per cent. of persons 65 years of age and over possessed \$5000 or more, either singly or with spouses. On the other hand, about one-sixth of the persons 65 years of age and over, and about one-fifth of those 70 years of age and over have no incomes—income including earnings, interest on investments, etc., and not including aid or gifts from children or others.

TABLE II  
FINANCIAL CONDITION

*Financial Condition of Persons Interviewed, 65 Years of Age and Over and 70 Years of Age and Over, not in Receipt of Public Pensions of \$360 or Over, or of Organized Charity.*

Annual Income (including for married persons, income of spouse) <sup>1</sup>	Persons Interviewed			
	65 Years of Age and Over		70 Years of Age and Over	
	Number	Percent.	Number	Percent.
<b>Total Interviewed<sup>2</sup></b> .....	<b>17,357</b>	<b>100.0</b>	<b>9,773</b>	<b>100.0</b>
Possessing property of \$5000 or more (including for married persons, property of spouse) Not reported <sup>3</sup> .....	7,078	40.8	3,960	40.5
\$1000 and over	2,536	14.6	895	9.1
\$700-\$999	1,072	6.2	477	4.9
\$600-\$699	399	2.3	210	2.1
Not possessing property of \$5000 or more, either singly or with spouse.....	391	2.2	211	2.2
\$500-\$599	263	1.5	144	1.5
\$400-\$499				
\$300-\$399	340	2.0	204	2.1
\$200-\$299	503	2.9	333	3.4
\$100-\$199	749	4.3	534	5.5
Under \$100	1,114	6.4	793	8.1
No income	2,912	16.8	2,012	20.6

1. Both members of a married couple are placed in same financial group, if both are over 65 years of age. No person under 65 years of age is included.

2. Not including 63 persons interviewed who refused to state the amount of their income.

3. Income not reported because of possessing \$5000 or more property, and therefore considered ineligible for old age pensions.

The Commission's investigation disclosed a very striking fact, namely, that the percentage of persons having property was approximately the same for the age groups 65-69, 70-74, and 75 and over, as will be noted from a reference to Table III. On the other hand, while 11.9 per cent. of persons 65 to 69 years of age had no income, 16.4 per cent. of those between the ages of 70 and 74, and 25.2 per cent. of those 75 years of age and over had no income.

In Tables II and III, both members of a married couple are placed in the same financial group, if both are 65 years of age and over. None of the tables contain information about persons under 65 years of age.

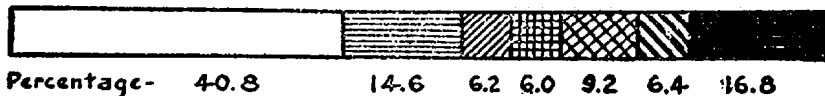
In Table IV the persons interviewed are classified according to individual incomes taking the means of a member of a married couple at one-half the total means of the couple. This

CHART 2. GRAPHIC PRESENTATION OF TABLE II (PAGE 102)  
 FINANCIAL CONDITION OF PERSONS INTERVIEWED  
 (PERCENTAGE DISTRIBUTION)

Possessing Property  
 of \$5,000 or More.

Annual Income of Those Not Possessing  
 Property of \$5,000 or More.

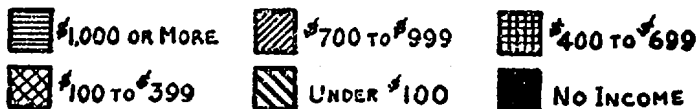
PERSONS 65 YEARS OF AGE AND OVER



PERSONS 70 YEARS OF AGE AND OVER



LEGEND OF INCOMES



has been the procedure under old age pension acts in Great Britain and elsewhere. On this basis, 32.8 per cent. of the non-dependent people interviewed have individual incomes of less than \$300 and 36.8 per cent. have incomes of less than \$400, for persons 65 years of age and over. Of those 70 years of age and over, 39.9 per cent. have individual incomes of less than \$300, and 43.6 per cent. have incomes of less than \$400. These figures show that a considerable number of the non-dependent aged population would be eligible to old age pensions with a means limit of either \$300 or \$365 or \$400, so far as income qualifications are concerned. The number of pensioners, however, would be reduced by the ordinary requirements of pension laws respecting citizenship, residence in the state a certain specified time, ability of children to support, and possession of property in excess of a certain limit, such as, for example, the \$3000 limit in the laws of other American states. It was found that some persons with small incomes possessed property worth between \$3000 and \$5000.

TABLE III  
 FINANCIAL CONDITION, BY AGE GROUPS  
*Financial Condition of Persons Interviewed not in Receipt of Public Pensions of \$360 or over or of Organized  
 Charity, by Age Groups.*

Annual Income (including for married persons, income of spouse) <sup>1</sup>	Persons Interviewed						
	65-69 Years		70-74 Years		75 Years and Over		
	Number	Per cent.	Number	Per cent.	Number	Per cent.	
<b>Total Interviewed<sup>2</sup>.....</b>	<b>7,584</b>	<b>100.0</b>	<b>5,125</b>	<b>100.0</b>	<b>4,648</b>	<b>100.0</b>	
Possessing property of \$5000 or more (including for married persons, property of spouse) Not reported <sup>3</sup> .....	3,118	41.1	2,102	41.0	1,858	40.0	
{ \$1000 and over	1,641	21.6	641	12.5	254	5.5	
{ \$700-\$999	595	7.8	333	6.5	144	3.1	
{ \$600-\$699	189	2.5	140	2.7	70	1.5	
Not possessing property of \$5000 or more, either singly or with spouse.....	\$500-\$599	180	2.4	132	2.6	79	1.7
{ \$400-\$499	119	1.6	78	1.5	66	1.4	
{ \$300-\$399	136	1.8	115	2.2	89	1.9	
{ \$200-\$299	170	2.3	161	3.2	172	3.7	
{ \$100-\$199	215	2.8	223	4.4	311	6.7	
{ Under \$100	321	4.2	359	7.0	434	9.3	
{ No income	900	11.9	841	16.4	1,171	25.2	

1. Both members of a married couple are placed in same financial group, if both are over 65 years of age. No person under 65 years of age is included.

2. Not including 63 persons interviewed who refused to state the amount of their income.

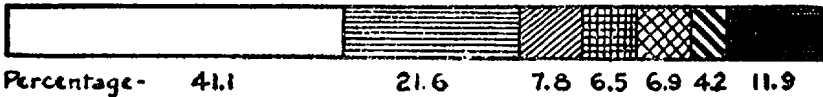
3. Income not reported because of possessing \$5000 or more property, and therefore considered ineligible for old age pensions.



CHART 3. GRAPHIC PRESENTATION OF TABLE III (PAGE 104)  
 FINANCIAL CONDITION OF PERSONS INTERVIEWED—By AGE GROUPS  
 (PERCENTAGE DISTRIBUTION)

Possessing Property of \$5,000 or More | Annual Income of Those Not Possessing Property of \$5,000 or More

PERSONS 65-69 YEARS OF AGE



PERSONS 70-74 YEARS OF AGE



PERSONS 75 YEARS OF AGE AND OVER



LEGEND OF INCOMES

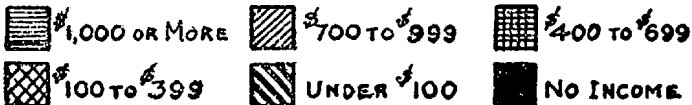


TABLE IV  
FINANCIAL CONDITION—ALLOWING EACH MEMBER OF MARRIED COUPLE  
ONE-HALF OF JOINT INCOME

*Financial Condition of Persons Interviewed, 65 Years of Age and Over not in Receipt of Public Pensions of \$360 or Over or of Organized Charity, assigning One-half the Joint Income to Each Married Person*

Annual Income (assigning one-half of joint income to each married person)	Persons Interviewed				
	65 Years of Age and Over		70 Years of Age and Over		
	Number	Percent	Number	Percent	
<b>Total Interviewed<sup>1</sup></b> .....	<b>17,357</b>	<b>100.0</b>	<b>9,773</b>	<b>100.0</b>	
Possessing property of \$5,000 or more (including, for married persons, property of spouse) Not reported <sup>2</sup> .....	7,078	40.8	3,960	40.5	
Not possessing property of \$5000 or more, either singly or with spouse .....	\$500 and over	3,233	18.6	1,244	12.7
	\$400-\$499	656	3.8	309	3.2
	\$300-\$399	702	4.0	365	3.7
	\$200-\$299	590	3.4	349	3.6
	\$100-\$199	805	4.6	562	5.8
	Under \$100	1,381	8.0	972	9.9
No income	2,912	16.8	2,012	20.6	

1. Not including 63 persons interviewed who refused to state the amount of their income.

2. Income not reported because of possessing \$5,000 or more property, and therefore considered ineligible for old age pensions.

Table V, following, shows the amount of property owned by persons interviewed who were 65 years of age and over.

TABLE V  
PROPERTY OWNED

*Persons Interviewed 65 Years of Age and Over Not in Receipt of Public Pensions of \$360 or over or of Organized Charity, Classified According to Property Owned, Including for Married Persons, Property of Spouse*

Property Owned	Total		Residents of Cities		Residents of Towns	
	Number	Per cent.	Number	Per cent.	Number	Per cent.
<b>Persons Interviewed</b> .....	<b>17,420</b>	<b>100.0</b>	<b>13,040</b>	<b>100.0</b>	<b>4,380</b>	<b>100.0</b>
\$5000 or over .....	7,078	40.6	5,153	39.4	1,925	44.0
\$4000-\$4999 .....	654	3.8	431	3.3	223	5.1
\$3000-\$3999 .....	724	4.1	435	3.3	289	6.6
\$2000-\$2999 .....	918	5.3	593	4.6	325	7.4
\$1000-\$1999 .....	1,032	5.9	727	5.6	305	6.9
Under \$1000 .....	1,545	8.9	1,131	8.7	414	9.4
No property .....	5,371	30.8	4,493	34.5	878	20.1
Not stated .....	98	.6	77	.6	21	.5

The Commission tabulated the information it received according to the conjugal condition of persons interviewed, and found that the condition of married persons was better than that of either single or widowed women, or single or widowed men. The Commission tabulated the sources of support of persons who had less than \$1000 annual income, classifying them by income groups. As would be expected, it was found that as the incomes decreased, the percentage of those who were self-supporting decreased and the percentage of those who were partially or entirely supported by others increased.

Of 7743 persons interviewed who had property of less than \$5000 and individual or joint incomes of less than \$1000, it was found that 2696, or 34.8 per cent., were self-supporting, 1071 of these persons being supported by earnings only, 397 by savings only, 904 by earnings and savings, and 324 by industrial pensions, annuities and miscellaneous sources of support. Of the 5047 persons partially or entirely supported by others, 4241 received their support from children, 686 from relatives and 120 from friends.

The Commission made a rather thorough inquiry into the resources of persons who had less than \$5000 property and less than \$1000 income, and among other matters secured information about the amount of life insurance carried by these persons. Table VI following, shows that nearly two-thirds carried no life insurance and most of the remainder had industrial policies.

Inquiry was made as to the age at which earning power became impaired or lost. The answers to this inquiry indicated that the average age at which impairment of earning power occurred was 65, and the average age at which loss of earning power occurred was 68 or 69, for those who answered this question.

Because old age pensions are payable only to citizens, an inquiry was made as to the citizenship of persons aided, and this information was tabulated by income groups. It will be noted that the greatest percentage of not-naturalized persons was in the group with no income.

An inquiry was made as to the length of residence in Massachusetts and it was found that 4 per cent. of the citizens interviewed had lived in Massachusetts less than fifteen years, 1.5 per cent. between fifteen and nineteen years, 2.2 per cent. between twenty

TABLE VI  
LIFE INSURANCE

*Persons Interviewed 65 Years of Age and Over, with Less than \$5000 Property and Less than \$1000 Income, not in Receipt of Public Pensions of \$360 or Over or of Organized Charity, classified by Amount of Life Insurance in Force, and by Age Groups*

Amount of Life Insurance	AGE GROUPS							
	65 and Over		65-69 Years		70-74 Years		75 Years of Age and Over	
	Number	Per cent.	Number	Per cent.	Number	Per cent.	Number	Per cent.
Total Interviewed.....	7,806	100.0	2,844	100.0	2,404	100.0	2,558	100.0
\$2000 and over.....	51	.7	14	.5	21	.9	16	.6
\$1000 but under \$2000.....	250	3.2	109	3.8	83	3.5	58	2.3
\$500 but under \$1000.....	380	4.9	194	6.8	110	4.6	76	3.0
\$200 but under \$500.....	1,116	14.3	519	18.2	350	14.6	247	9.6
\$100 but under \$200.....	816	10.5	311	10.9	288	12.0	217	8.5
Under \$100.....	72	.9	28	1.0	24	1.0	20	.8
None.....	4,994	63.9	1,632	57.5	1,500	62.3	1,862	72.8
Not stated.....	127	1.6	37	1.3	28	1.1	62	2.4

TABLE VII  
NATIVITY AND POLITICAL STATUS

*Persons Interviewed 65 Years of Age and Over with less than \$5000 Property and less than \$1000 Income, not in Receipt of Public Pensions of \$360 or Over, or of Organized Charity, classified by Amount of Annual Income, Birthplace and Political Status*

Annual Income <sup>1</sup>	Native Born				Foreign Born			
	TOTAL	Total	Born in Mass.	Born in other states	Total	Naturalized	Not naturalized	Per cent. not naturalized <sup>2</sup>
<b>Persons with Incomes Under \$1000, Total</b> .....	<b>7,806</b>	<b>3,893</b>	<b>2,669</b>	<b>1,224</b>	<b>3,913</b>	<b>2,267</b>	<b>1,646</b>	<b>21.1</b>
\$700-\$999.....	1,072	572	389	183	500	329	171	16.0
\$600-\$699.....	399	230	163	67	169	95	74	18.5
\$500-\$599.....	391	224	167	57	167	107	60	15.3
\$400-\$499.....	263	148	110	38	115	72	43	16.3
\$300-\$399.....	340	205	149	56	135	89	46	13.5
\$200-\$299.....	503	252	189	63	251	173	78	15.5
\$100-\$199.....	749	415	294	121	334	231	103	13.8
Under \$100.....	1,114	620	433	187	494	293	201	18.0
No income.....	2,912	1,184	745	439	1,728	865	863	29.6
Not stated.....	63	43	30	13	20	13	7	11.1

1. Joint income in case of married couples. Both members of a married couple, if 65 years of age or over, have been placed in same income group.

2. By income groups. Percentage shown of total interviewed in income group.

and twenty-four years, and 92.3 per cent. had resided in the state twenty-five years or more.

It was found that 77 per cent. of the persons interviewed who had less than \$5000 property and less than \$1000 income had children living, and only 23 per cent. were without living children. This is in marked contrast to the information collected concerning recipients of charity, for it was found that nearly 57 per cent. of the aged recipients of outdoor relief, and nearly 71 per cent. of the aged almshouse inmates had no children living

Miss. Helen F. Smith of the statistical staff of the Commission computed the number of children living of 100 average persons of the following groups.

100 non-dependent aged persons have on the average 260 children living.

100 recipients of outdoor relief have on the average 100 children living.

100 almshouse inmates have on the average 62 children living.

100 residents of private homes for the aged have on the average 57 children living.

The Commission found that nearly all of the private homes for the aged were filled to capacity and that most of them refused to admit applicants with children who could support them.

The Commission interrogated the aged people not dependent on charity to ascertain if their children were able to support them in case of need, and this information was classified by the number of children living, as will be noted from Table VIII. As would be expected, the ability of children to support in full increased with the number of children living. A person with five or more children living is in slight danger of having to go to the almshouse in old age. Theodore Roosevelt was right. A large family of children is a great advantage. Among other things, it helps to keep one out of the poorhouse.

The Commission secured information about the number in the families of these aged persons and found that nearly 90 per cent. lived either alone or in families of less than six members.

The Commission secured detailed information concerning the almshouse inmates 65 years of age and over in order to ascertain how many could leave these institutions and live on an old age

**TABLE VIII**  
**EXTENT CHILDREN CAN AID**

*Persons Interviewed 65 Years of Age and Over with less than \$5000 Property and less than \$1000 Income, not in Receipt of Public Pensions of \$360 or Over or of Organized Charity, classified by Number of Children living 18 Years of Age and over, and Extent Children can support them if Necessary*

	TOTAL		Extent Children Can Aid								Not Stated	
			Full		Full, with difficulty		Partial		None			
	Number	Percent	Number	Per cent.	Number	Per cent.	Number	Per cent.	Number	Per cent.	Number	Per cent.
<b>TOTAL</b> .....	<b>7,806</b>	<b>100.0</b>	<b>5,050</b>	<b>64.7</b>	<b>58</b>	<b>.7</b>	<b>474</b>	<b>6.2</b>	<b>2,200</b>	<b>28.2</b>	<b>24</b>	<b>.2</b>
Persons having:												
1 child.....	1,258	100.0	879	69.8	26	2.2	146	11.5	198	15.7	9	.8
2.....	1,157	100.0	991	85.7	10	.9	84	7.3	65	5.5	7	.6
3.....	1,010	100.0	861	85.2	9	.9	85	8.4	52	5.2	3	.3
4.....	812	100.0	719	88.6	4	.5	58	7.1	30	3.7	1	.1
5.....	604	100.0	528	87.5	5	.8	44	7.3	24	4.0	3	.4
Over 5.....	1,152	100.0	1,072	93.0	4	.4	57	4.9	18	1.6	1	.1
None.....	1,813 <sup>1</sup>	..	..	..	..	..	..	..	1813	..	..	..

1. Includes 885 single persons.

pension. It was found that a very large number of inmates were in poor health and were in these institutions because of the need of medical or hospital care. Massachusetts almshouses are becoming infirmaries to a great extent. The card schedules were carefully examined to ascertain how many inmates would qualify for old age pensions. After deducting those ineligible because of lack of citizenship, or because of less than fifteen years' residence in the state, and deducting those whose physical condition made it impossible for them to live outside on a pension of no more than \$7 a week, it was found that as a maximum number, only 31 per cent. of the inmates 65 years of age and over, and only 25 per cent. of those 70 years of age and over, could leave these institutions and live on a pension. Because aged inmates are only a portion of the total inmates of almshouses, only a small part of the cost of maintaining almshouses would be saved by the passage of an old age pension act.

The Commission collected information concerning 3361 recipients of public outdoor relief, 430 recipients of both public and private outdoor relief, and 1471 recipients of private outdoor relief, in order to determine the number of old age pensioners.

As the old age pension laws of other states provide that pensions shall not be given to persons with children able to support them, inquiry was made as to the amount that children of these recipients of outdoor relief could aid their aged parents. It was found that the children of these recipients were not able or had not been forced to do very much for their parents and that the cost of old age pensions to these charity cases would be reduced only 10 or 15 per cent. by a provision of a pension act taking into account the ability of children to support.

The Commission made a study of the 2921 residents of the 107 private benevolent homes for the aged in Massachusetts, to determine the condition of these persons, and the number of possible old age pensioners. The Commission estimated the number aided by miscellaneous sources, such as churches, trust funds, hospitals for incurables, and the aged blind persons aided by the Division of the Blind. An investigation made in 1915 in connection with the State Census showed that comparatively few aged persons received aid from these sources.

The report shows the amounts expended by public and private



charity in outdoor relief for the benefit of aged persons, and estimates the probable reduction in these expenses if an old age pension act should be passed. In view of the fact that most of the persons who would be entitled to benefits under an old age pension act are not now in receipt of aid from organized charity, the amount of saving in charity through the establishment of a pension system would be only about 10 per cent. of the cost of an old age pension plan.

The Commission's report contains chapters on the cost of aid and relief under existing laws, and possible sources of revenue for payment of old age pensions. The cost of various types of old age pension laws has been computed. Appendices to the report furnish information concerning industrial pension plans, pensions for clergymen, pensions for members of labor unions, pension laws in foreign countries, pension laws in American states, and a description of the present plans of life insurance companies, and of the Massachusetts system of Savings Bank Life Insurance for providing funds for old age.

The report contains more than seventy statistical tables. The Commission has endeavored to furnish the legislature with full information relating to old age pension, and trustworthy data from which the cost of various types of old age pension acts can be calculated. The report has been filed and it is expected that the printing will be completed about November 30th and copies made available for distribution.

## NOTE ON THE NORMAL PROBABILITY CURVE

BY

BUCKNER SPEED\*

Technical Expert, Patent Department, Bell Telephone Laboratories

In a former paper ("A New Graphic Method of Using the Normal Probability Curve" in the *Proceedings* of this Society, Volume II, page 120) I called attention to the fact that if the equation of the normal probability curve is written

$$y = \frac{n}{s \sqrt{2 \pi}} e^{-(x^2/2s^2)}$$

and we take logarithms of both sides we get

$$\log y = \log \frac{n}{s \sqrt{2 \pi}} - \frac{x^2}{2 s^2}$$

and putting  $\log y = u$  and  $\log \frac{n}{s \sqrt{2 \pi}} = k$

$$u = k - \frac{x^2}{2 s^2}$$

which is a parabola with its vertex at  $\begin{cases} u = k \\ x = 0 \end{cases}$

Now if  $A, B, C, D, E, F$ , etc., are equidistant ordinates of the normal distribution curve, and  $a, b, c, d, e, f$ , etc., are the common logarithms of the above numbers, then

$$(a - b) - (b - c) = (b - c) - (c - d)$$

which is equivalent to saying that the second order of differences is a constant *i. e.*, a parabola

or

$$d = a - 3b + 3c$$

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\*Paper presented by Buckner Speed, Technical Expert, Patent Department, Bell Telephone Laboratories, on invitation of the Committee on Program.

or going back to natural numbers

$$\text{2nd term, } D = \frac{A C^3}{B^3}$$

and by similar substitutions

$$\text{3rd term, } E = \frac{A^3 C^6}{B^6}$$

and if in the series  $A, B, C, D, E, F$ , etc., we call  $B$  the 0 term and  $C$  the 1st term, we get

$$n\text{th term, } = \frac{A^{\frac{1}{2}(n^2 - n)} C^{\frac{1}{2}(n^2 + n)}}{B^{(n^2 - 1)}}$$

Thus, any portion of the normal distribution curve being known, so that we may measure or otherwise determine three equidistant ordinates, we may extrapolate in either direction.

Now, if we choose  $A, B$ , and  $C$ , so that  $B$  is the maximum ordinate, that is to say, the vertical axis of the curve, and  $A$  and  $C$  are equidistant from  $B$ , and therefore equal to each other, then

if we make  $\frac{A}{B} = r$ , we get

$$D = A r^3$$

$$E = A r^6$$

$$n^{\text{th}} = A r^{(n^2 - 1)}$$

The above equations are based on the fact that the second order of differences of  $a, b, c, d, e, f, g$  is a constant or that the third order of differences is zero, which is merely another way of saying that the points  $a, b, c, d, e, f, g$  are on a parabola.

Now as is well known many collections of data when platted form a skew distribution in which the maximum ordinate is not in the center, and the slopes of the two shoulders is different.

Let us take the case where the third order of differences of  $a, b, c, d, e, f, g$ , is constant, and the fourth order is zero.

We then get

$$[(a-b)-(b-c)] - [(b-c)-(c-d)] = [(b-c)-(c-d)] - [(c-d)-(d-e)]$$

from which  $e = 4b + 4d - a - 6c$

or going back to natural numbers

$$\text{2nd term, } E = \frac{B^4 D^4}{A C^6}$$

$$\text{3rd term, } F = \frac{B^{15} D^{10}}{A^4 C^{20}}$$

$$\text{4th term, } G = \frac{B^{36} D^{20}}{A^{10} C^{45}}$$

$$n\text{th term} = \frac{B^{\frac{1}{2}n(n-1)(n+2)} D^{\frac{1}{6}n(n+1)(n+2)}}{A^{\frac{1}{6}n(n^2-1)} C^{\frac{1}{2}(n^2-1)(n+2)}}$$

or if we put  $\frac{B^3 D}{A C^3} = M$

$$\text{2nd term, } E = M \frac{B D^3}{C^3}$$

$$\text{3rd term, } F = M^4 \frac{B^3 D^6}{C^8}$$

$$\text{4th term, } G = M^{10} \frac{B^6 D^{10}}{C^{15}}$$

$$n\text{th term} = M^{1/6(n^3-n)} \frac{B^{1/2(n^2-n)} D^{1/2(n^2+n)}}{C^{(n^2-1)}}$$

the coefficient  $M$  has the significance of a modulus of skewness,

thus  $\log\left(\frac{1}{M}\right) = k$  where  $k$  is the third order of differences

of  $a, b, c, d, e, f, g$ , that is

$$k = [(a-b) - (b-c)] - [(b-c) - (c-d)]$$

When the probability is normal, and the logarithm curve is a parabola  $k = 0$  (*i. e.*, 3rd order of difference) and hence  $M = 1$ .

ABSTRACT OF THE DISCUSSION OF PAPERS READ  
AT THE PREVIOUS MEETING

EXPERIENCE RATING *In Rem* AND *In Personam*—LEON S. SENIOR  
VOL. XI., PAGE 211

WRITTEN DISCUSSION

MISS EMMA C. MAYCRINK:

This paper not only introduces a novel idea, but is in itself unique, in that it treats of an administrative problem instead of the usual subjects which have been presented at the meetings of the Society. The fundamental problems of making rates, rating plans and rules governing their application, are urgent and must necessarily come first. This might be termed the legislative function. Of no less importance in the development of casualty insurance is the interpretation and final administration of the plans which have been adopted. Unquestionably the executive and judicial functions demand thought and study since a lack of intelligent and consistent application of laws and codes tends to defeat their purpose and to destroy public confidence in the entire system.

Mr. Senior's paper is in itself a discussion. Both sides of the argument are given, and since the conclusion finally drawn appears to conform to the rule as it now stands in the New York plan and is practically the same as that in the plan issued by the National Council on Compensation Insurance for most of the other states, further discussion would be superfluous.

It might, however, be noted in passing that the idea of making the risk the criterion for merit rating, regardless of ownership, if followed to its inevitable conclusion, becomes as fantastic as Frankenstein—a mere matter of structure and mechanisms lacking authoritative control. The Industrial Schedule which is devoted almost entirely to the physical hazards embodies the idea of a merit rate based on the tangible evidence disclosed by an inspection of the risk, or to be more specific, the plants making up the entire risk. Experience rating was devised, whether wisely or not, to measure those other intangible features of the

risk, good or bad, dependent to a great degree upon the individual ownership or group of owners and those to whom they delegate authority.

It is stated that the status of the ownership and control is not permanent and the suggestion is that it is not always easy to follow the gamut of changes which may take place. Is it not equally true that the risk is also a variable, changing with, and dependent upon, the ownership?

It would seem that decisions under this rule should be governed entirely by what we are trying to do. If the experience rating plan is to measure the so-called morale, the rules of the plan should follow the fundamental intent. It is to the ownership and management which is controlled by the ownership that we look for the policies which produce the risk's experience.

The rule to exclude experience upon change of ownership was evidently inserted to discourage attempts to avoid the results of charges resulting from poor experience. The difficulty which has been met with in its application is invariably encountered in applying any plan of merit rating based upon experience. When there are no bad accidents the assureds are eager to receive the reward of a lower rate and demand that even greater credence be given to individual risk experience. When, however, frequent or severe accidents occur they seek to reduce the penalties or avoid them entirely.

This rule of the experience plan, as well as others which are apt to provoke controversy, should be definitely phrased so as to minimize any chance of avoiding the penalty of heavy loss experience by the use of some pretext such as transfer of stock from one member of the family to another or by simply hiring a new manager or a new foreman. Nor should it be necessary to call upon a committee of underwriters to go into the details of the various financial reorganizations to determine whether a change of ownership has occurred. This can only be determined by an intimate knowledge of the companies' books of accounts. Examination into these details in committee sessions takes valuable time. Furthermore it is not exactly an underwriting question.

To allow a company to drop its old experience, the change should be so patent that the risk no longer resembles its former self any more than it resembles an entirely different risk. Any

other interpretation of the rule certainly encourages attempts to avoid charges and opens the way to unfair discrimination.

MR. SYDNEY D. PINNEY:

Of all questions referred to rating organizations for decision in connection with the application of the Experience Rating Plan perhaps the one which recurs most frequently is with respect to the elimination of the past experience of a risk on the grounds that there had been a material change in management of the plant in question. The rules of procedure incorporated in the Experience Rating Plan provide that the past experience shall be disregarded only if the change in management is material, but that if the change is merely nominal, then the past experience shall be utilized in determining the experience modification. It is evident that the terms "material change" and "nominal change" require clear cut definition or otherwise the element of judgment will play too great a part in the decisions rendered by the rating organization, and this may lead to inconsistencies, if not actual inequities.

In discussing this subject Mr. Senior has not only dealt with the problem of giving a clear interpretation of the existing rule but has also discussed the merits of an altogether different procedure which, in brief, would require that the experience should follow the plant or operations instead of following the person or persons responsible for the management of the plant or operations. The principle of having the experience follow the plant or operations is designated by Mr. Senior as "experience rating *in rem*" and the present procedure is referred to as "experience rating *in personam*." The author has confined himself for the most part to a review of the discussion which took place in the Rating Committee of the New York Board relative to this proposal. The subject was considered from the legal viewpoint as well as from the underwriting viewpoint and the arguments for and against the proposal are enumerated under each of these general headings. A careful reading of Mr. Senior's article leaves the impression that much more might have been said particularly in favor of "experience rating *in personam*" than appears in the summary of the arguments presented in the Rating Committee. The arguments favoring "experience rating *in rem*" are not in every case convincingly answered by the opponents of the pro-

posed change. In preparing this article Mr. Senior has evidently avoided supporting either one side or the other but has recorded merely the opposing viewpoints as brought out in the Rating Committee discussions. It might do no harm therefore in this discussion of Mr. Senior's paper to elaborate somewhat further in the hope of answering more specifically the arguments raised in favor of "experience rating *in rem.*"

One of the points stressed in favor of the proposal was that the purchaser of an enterprise should inherit the past experience as one of the assets or liabilities of the risk. This viewpoint is diametrically opposed to the fundamental principle justifying experience rating which is to the effect that the experience is subject to control by the assured. Naturally, it would not be a very difficult accomplishment to justify to the purchaser of an enterprise a reduction in his insurance rate due to the past experience of the plant, but it certainly would be a different proposition when it came to charging an increase in rate for unfavorable experience incurred in the plant before he had anything to do with it. For the sake of illustration, let us consider that the past experience of a plant is similar to that more or less intangible asset—good will. Suppose a manufacturer, A, who has an excellent reputation for turning out a certain product takes over the plant of manufacturer B, whose product is of inferior grade. A is going to manufacture his product in the plant purchased from B. A will introduce his method of manufacture and his name and guarantee will attach to the product. It is obvious that the product will still carry the high reputation of A and there will be no impairment of this reputation due to the fact that it happens to be manufactured in a plant which under a different owner and process produced an inferior product. This analogy leads to the conclusion that the experience modification should be based upon the past experience incurred under the supervision and management of the assured. If the purchaser of the enterprise is just starting in business and therefore has no past experience the only fair treatment is to write the risk at manual rates. If the purchaser of the enterprise is one who has been in business for a number of years previous, then the experience developed under his previous operations should determine the experience modification applied to his compensation insurance rates for the newly purchased plant.



Supporting the proposal of "experience rating *in rem*," it is reasoned that one would expect that the experience in a particular plant would be the same under new management as it had been under the old. If the truth of such a statement were admitted there would be little point in safety work of any kind. We would simply admit that accident frequency and severity would always be the same in plants using similar methods of manufacture regardless of differences between such plants as respects the guarding of machines, education, type of employec, etc. In the case of contracting risks it is evident that such a hypothesis could hardly be supported for here the management and control plays a most important part in the development of the compensation experience.

The argument is raised that there would be no inducement for the new owner to remedy the equipment of a newly purchased plant unless it was directly brought to his attention that he is the legitimate successor to the past experience. This argument is one-sided, since it considers only the case where the past experience has been unfavorable. If we consider the proposition from the other viewpoint, *i. e.*, where the past experience has been favorable, would it not be reasonable to expect that the owner, if given the benefit of an experience credit which he had not earned, would be in the position of having obtained something for nothing and consequently would not appreciate the value of this credit. Would he not be even less inclined to stimulate safety work and thereby better the experience of the risk than if he were to be written at manual rates? Certainly, if the past experience of the plant has been unfavorable, the insurance carrier will be most careful to call to the attention of the new owner the necessity for keeping his experience down to a minimum for, with the risk written at manual rates, it is apparent that the insurance carrier may suffer an abnormally adverse loss ratio unless this is done. Furthermore, it appeals to the writer that a new owner would be more inclined to strive to produce favorable experience if given a fresh start by writing his risk at manual rates than if he were penalized at the outset with the faults of his predecessor. The present plan of experience rating does not respond quickly to changes in the experience developed by a risk and, therefore, if the new owner were to be penalized at the outset with a debit, even though he were to bring about a decided

improvement in the working conditions and experience of the plant, it would take years for this to reflect itself in his compensation rates. Therefore, it is felt that the fairest treatment in such cases is to disregard the past experience where there has been a material change in ownership and management and give the assured the benefit of manual rates.

The statement is made that "experience rating *in rem*" would be simpler in application than the present procedure, since it would no longer be necessary for the rating organization to decide questions as to whether or not the changes in ownership and management were of a nominal or material character. Whereas it is true that "experience rating *in rem*" would eliminate the necessity for deciding questions as to changes in ownership and management, there would be introduced other difficulties which would be far more serious than those which are encountered under the present procedure. As brought out in Mr. Senior's paper, it would be necessary to revamp the definition of the term "risk" and, furthermore, there would be a very nice problem involved in the keeping of experience data for experience rating purposes. The idea might possibly be worked out in the case of manufacturing plants which have more or less permanent locations but, when it is attempted to follow the procedure through in the case of contracting operations, we are immediately confronted with the problem of segregating experience by individual contracts which, as time went on, would probably result in considerable confusion, if not in chaos. Imagine the difficulties which would ensue under such a system if, in addition to changes in ownership and management, there were also concurrent changes in the insurance carrier, and this would probably happen in the majority of cases.

The solution, therefore, seems to be in the direction of clarifying the present rule. As a matter of fact, "experience rating *in personam*" is not so very far removed from "experience rating *in rem*" for, under the present rule, the procedure is to follow the experience of the risk as at present defined unless conclusive evidence can be shown why such experience should be disregarded. In the majority of cases "experience rating *in rem*" and "experience rating *in personam*" are of course identical. When the occasional case is met with where there has been a change in ownership and/or management, the burden of proof always rests

on the side of those advocating the elimination of the past experience of the risk. If, however, it can be definitely shown that the change in ownership and management is of such a nature as will affect the conditions responsible for the experience of the risk, then and then only is it proper to exclude the past experience.

The revised ruling adopted by the New York Board which is quoted in Mr. Senior's article represents a decided improvement in the clarification of the rule and should go a long way toward eliminating the element of judgment which has caused most of the difficulty in rendering decisions on doubtful or borderline cases. The National Council on Compensation Insurance and the National Bureau of Casualty and Surety Underwriters have adopted a set of rules defining "nominal changes" and "material changes" in management which are more detailed than those incorporated in the New York Experience Rating Plan but to all intents and purposes the New York rule should prove altogether satisfactory.

Mr. Senior has directed attention to one of the most troublesome features in connection with the administration of experience rating and it is felt that Mr. Senior's intelligent analysis and review of this subject not only will prove most helpful to rating organizations and insurance carriers in dealing with this problem but also is a valuable contribution to the literature available for the education of all students of compensation ratemaking and its related problems.

MR. GEORGE F. HAYDON:

The title "Experience Rating *In Rem* and *In Personam*" incorporates within itself a degree of allurements and promise which the body of the article bears out in the fullest measure. Mr. Senior elected to elaborate on a subject which easily leads itself to dissection, one which is very definitely alive and, despite any disposition which may be made of it at present or in the future, will always remain a potential subject for renewed discussion.

In referring to the proposal that the present mode of procedure stipulated in Rule No. 32 be upset, Mr. Senior states in part that

"the new proposal should be divided so as to give proper weight to the legal as well as to the underwriting aspects of the case, and that preference should be given to the legal viewpoint as being the more important of the two."

In this connection, unless my observations have misled me, Mr. Senior can always be relied upon to dignify the most mundane and unexpected subject with the mantle of the Law. To the mind untrained in legal technique, invoking or anticipating a legal sequence is merely courting unnecessary tribulation and creating an atmosphere or screen behind which the legal wizards may befuddle the senses. It must be admitted, however, that the mantle brings to our otherwise sadly maligned system of Experience Rating a degree of added importance resulting in a psychological reaction of no mean measure. But is the added prestige a good investment? Does it make for an enduring admiration without a penalty attachment? Might it not be that the precedent of making a legal inquiry into a specific rule or practice might provoke similar treatment in the case of other rules and practices, with the prospect of never ending and interminable quibbles and misunderstandings? In the interest of smooth application—not expediency by any means—might it not be advisable to study each problem on its merits and be governed by the procedure which promises to ensure the most equitable treatment to all concerned, and leave out any suggestion of resorting to legal technique, except as such technique may be made to serve as a factor, with no more weight than the remaining considerations which, combined together, constitute the whole?

Turning to the merits of the question, Mr. Senior has not committed himself to any personal opinion except as to act as arbiter of the various opinions offered and to draw certain conclusions therefrom. The outstanding impression gained from a careful perusal of the opinions, is that considerable thought and study was given generally before the conclusions were reached; this being equally true in the opinions given in favor of the proposal, as in the case of those cast against it. Of the five opinions given by the Committee of distinguished lawyers, three were in favor of the proposal and two against, which, from the standpoint of numerical weight, would award the decision in favor of the proposal. This, however, was reversed in the case of the opinions submitted by the underwriters, wherein it is noted that out of conclusions reached by seven underwriters, three were in favor of the proposal and four against. Grouping the two sets of conclusions together, we find an even division, there being six in favor of the proposal and six against. Adoption of this method of

measurement, without further consideration, suggests a deadlock; hence, it becomes necessary to examine the worth of the conclusions and draw an arbitrary decision therefrom. This then introduces the element of personal opinion, and it is with a definite knowledge of treading on delicate ground that I undertake the trespass.

A summary of the high lights for the proposal, submitted by both the legal profession and underwriters, appear to be substantially as follows: That new ownership should inherit experience on a basis similar to that upon which it accepts the degree of good will and other intangible but influencing circumstances which may be bequeathed to it; that it is logical for the experience to follow the risk because the mental picture created in the mind of the underwriter is that of a tangible physical matter which promises to remain indefinitely and which is expected to ride along as a distinct and individual unit regardless of management change, paying the penalty of its own sins, and collecting its own rewards, this being particularly true in the case of manufacturing establishments; that the management of a plant may go out of business entirely, in which event, under the application of the existing rule, the experience of the risk would become lost; that if the experience is not held to follow the risk, there would be no inducement or incentive for the successor to cure, correct and remedy the equipment of the risk, the experience arising out of which was unfavorable; finally, should the experience follow the risk rather than the person, the uncertainties of the schedule and legal requirements fixing material changes in ownership and management would be definitely avoided and thereby solve a present day rating difficulty. In short, it is claimed that the proposal would create a situation which would be simple, effective and equitable.

An analysis of the conclusions against the proposal might be summarized as follows: That it is unfair to charge a new ownership with the misdeeds or ill luck of a previous one, if only from the standpoint of handicapping a new ownership inheriting poor experience as compared with one inheriting good experience, or, none at all; that in those cases where unfavorable experience is due to poor physical conditions, the penalty will continue to be imposed regardless, by virtue of the application of the schedule rating system; that experience rating is intended to measure the

moral quality of the management and thus, manifestly, should follow the management responsible for such experience; that, if an assured owns or acquires separate enterprises, each enterprise, for the purpose of experience rating, would have to be treated as a separate risk rather than part of the whole as at present; that, in the case of contractors, in the event of new ownership, on account of the absence of physical characteristics, it would be much more logical for the experience to follow the person than the risk. In short, any proposal to reverse the existing rule, would introduce a grave note of discrimination.

If the foregoing can be accepted as a true picture of the high lights then, from an impartial review, I am not satisfied that Mr. Senior's conclusion

"that the theory for Rule No. 32 seems to be in accord with the general principle of the plan itself; that it is not proper either in law or insurance practice to charge a new owner with the sins of the past or to give rewards for experience not earned under his supervision"

is a fair and balanced judgment of the various opinions. On the contrary, if either one of the viewpoints is more meritorious than the other, I am inclined to believe that Mr. Senior has selected the wrong one. This may not necessarily mean that the reversal of the present rule is the proper thing to do, for it is quite within the realms of possibility that the proponents of the new proposal made the best of their case, and that the champions of the existing practice did not; however, the fact remains, and it is difficult to conceive how Mr. Senior could award the laurels to either viewpoint with such degree of definitiveness.

In conclusion, it would be out of harmony with the pleasure I derived in perusing the article, to do so without first paying tribute to the clarity of Mr. Senior's expression and to the purity of his English, it being of a character calculated to give sweetness to any article which otherwise may be very mediocre and, which decidedly Mr. Senior's is not.

#### AUTHOR'S REVIEW OF DISCUSSIONS

##### MR. LEON S. SENIOR:

Of the three discussions submitted on this paper, Miss Maycrink and Mr. Pinney favor the theory that experience rating shall follow *in personam*, while Mr. Haydon appears to take exception

to this view. After paying a graceful compliment to the author for the manner in which the subject has been presented, he questions the necessity of delving into the law of the case. The impression I get is that Mr. Haydon feels that the points involved could be settled on underwriting principles without reference to the law. I think the answer to Mr. Haydon is that we are forced to recognize the legal question since our practice affects important property rights. To deprive an employer of the right of using past experience amounts to a deprivation of property rights and cannot be done without a justifiable legal basis. The very essence of the workmen's compensation policy is to protect the employer against losses arising because of certain legal liabilities. The nature of the insurable hazard differs: first, because of differences in state laws, and second, because of differences in the physical character of the risk. The law furnishes the foundation for the contract, and it would be just as impossible for the underwriter to ignore the legal principles involved in experience rating as to ignore the differences between the New York and Wisconsin laws in determining premium rates for New York and Wisconsin risks. Aside from this criticism, Mr. Haydon thinks that I have reached the wrong conclusion in sustaining the advocates of experience *in personam*. It is to be regretted, however, that Mr. Haydon's judgment is not supported by more definite reasons. No effective answer is presented to the particular obstacle which confronts the proponents of experience *in rem* in the treatment of contracting risks. If experience *in rem* is sound it should not be difficult to establish its value for contracting as well as manufacturing risks. The theory, however, seems to break down completely in the case of contracting operations. It is conceded that experience *in rem* does not fit in properly with this type of risk. Here we are confronted with personal and corporate organizations. To apply experience *in rem* would seem to be out of the question. Miss Maycrink makes that clear in a very effective sentence: "The idea of making the risk the criterion for merit rating, regardless of ownership, if followed to its inevitable conclusion, becomes as fantastic as Frankenstein—a mere matter of structure and mechanisms lacking authoritative control." This is the whole story in a nutshell. Mr. Pinney makes a telling point by an apt illustration: If a manufacturer with a high reputation, turning out a fine

product, purchases another plant turning out an inferior product, it is reasonable to believe that the purchaser will change the character of the plant and its product so as to compare favorably with the original plant. This example furnishes a perfect analogy and provides an excellent argument in support of the idea that experience rating should follow the owner and not the *res*.

It is a matter of deep satisfaction that the subject so lightly treated in my original paper has been carefully discussed by competent critics. I am grateful for the generous form of the criticism and believe that the discussion will prove useful in the application of the principle to cases that arise in daily practice.

STATE REGULATION OF INSURANCE RATES—CLARENCE W. HOBBS

VOL. XI., PAGE 218

WRITTEN DISCUSSION

MR. A. H. MOWBRAY:

We, of the insurance business, are apt to think of ourselves as being excessively subject to regulation if not persecution by state officialdom. It is well, therefore, that we have now and then from the pen of an experienced legislator and public official so sound an exposition of the tendency of legislative thinking on the regulation of economic activities in general as is contained in the earlier paragraphs of Mr. Hobbs' paper.

It is difficult to discuss a descriptive paper such as this, especially when written by a master hand and none can dispute that Mr. Hobbs' experience in public life makes his such. One can only comment on the philosophy of the situation and the policy of action indicated.

If one may digest the analysis of the situation as set forth in this paper, we should say that it shows a beginning of regulation to enforce competition, now passing out of date but still leaving certain traces in the statutes, in some cases at variance with the spirit if not the actual letter of later legislation in the same jurisdiction. This is followed by a tendency to supervise cooperative regulation following through to definite state regulation which in turn tends to develop into actual state prescription.

There is evidence in the material adduced by Mr. Hobbs of the lack of community of interest between the agent and the company or companies he represents, for example in legislation forbidding



cooperation to regulate commissions and, though not mentioned by Mr. Hobbs, resident agent laws. We are all inclined to look after our own interests first even when we are charged with the responsibility of agency. But class legislation of this kind in the long run being inimical to the business as a whole is adverse to the best interests of the agents themselves. Despite the existing keen competition to secure agents the burden is on the companies it seems to me to bring home to the field men as a whole the proper realization of this fact. This is especially so because of the power of the agents as a body in local affairs and through local representatives on legislation of which the laws cited are evidence.

There is a tendency to resist with all our force interference with our own lives, that is, if we are the usual type of Anglo-Saxon individualists. But force tends to call forth force in opposition and rarely is reaction the road to power. There is a real danger to the companies in the possible abuse of power of State officials charged with regulation of rates. Mr Hobbs has outlined the legal resources and the attitude of the courts, from which it appears that relief can be had from them only on reasonable proof that rates are or have become confiscatory. Difficult as it is to offer convincing proof in the case of such public service corporations as railroads, it is far worse in our business especially without clearly accepted standards. Such standards are accepted in the field of life insurance and they should be in ours.

Mr. Hobbs has quoted the usual official standard in the following language:—"Now adequacy for rate making purposes is determined by taking the aggregate loss experience of the carriers concerned and the aggregate expenses, and comparing the results with the rates." (Page 272). But can we accept this as it stands? Must we not consider the trend of experience, the likelihood that over a long period of time it is getting better or worse? And must we not recognize the effect of the economic phenomenon known as the business cycle? If it has an effect on our experience it seems to me we must. We may not adjust our rates accurately to its swing. But if we do not, must we not consider its variations in selecting the period for test? Or rather, since not we but the officials and the courts will make the tests, must we not find the evidence that will convince them in this regard. I have had the privilege of participating in making a study that

seems to point clearly to a cyclic swing and we expect to present the results in a paper at this meeting.

Naturally this Society is the forum in which the facts leading to such standards can be most impartially and successfully brought out and Mr. Hobbs' paper should spur us to further effort in this regard.

MR. MORRIS PIKE:

It is a privilege to be permitted to discuss the very interesting and informative paper delivered by Mr. Hobbs on the subject of State Regulation of Insurance Rates.

Mr. Hobbs has ably presented the philosophy and theory behind this regulatory movement and has furnished detailed information with respect to its genesis and nature. The paper under observation is conspicuous for the numerous citations of the legal authorities both in the insurance and the public utility field, the latter field having been subjected to a degree of regulation somewhat similar to that in the insurance line and having the added advantage in that many of its regulatory statutes have already come before the judicial authorities for determination.

With respect to the arrangement of Mr. Hobbs' paper, I have one suggestion to make, and that is that possibly some of the readers of his paper might be aided by a table presenting a concise summary of the insurance statutes of the forty-eight states. It would not be a simple task to adequately so summarize the statutes but possibly the benefit to be derived therefrom might warrant the undertaking.

The reader of Mr. Hobbs' paper cannot but be impressed with the heterogeneous character of the insurance statutes of the various states. The business of insurance has long been regarded as affected with a public interest and calling for State supervision. This supervision has subjected to its scrutiny the solvency of the carriers; the imposition of taxes; the fixing of limits of liability on individual risks; the filing of annual reports on condition and affairs; the examination of the nature and amount of the carriers' investments, capital stock and deposits; and, latterly, jurisdiction over rates, policy forms and profits. In particular, multitudinous differences make their appearance in insurance rate making laws affecting such matters as:—

Prohibition against acting in concert; membership in rating organizations; membership in stamping offices; permission to deviate from the rating organizations' rate level; the filing of rating data; the filing of experience statistics; approval as to non-discriminatory character of rates; approval as to the adequacy of rates; approval as to the reasonableness of rates; manner of determining such non-discriminatory, adequate or reasonable rates; exemptions for certain lines of insurance; exemptions for certain types of carriers; approval of policy forms and clauses; etc.

This diversity in the extent and manner of insurance regulation can not but be reflected in diversity in the carriers' methods of conducting the business. The increased cost of doing business in compliance with the various requirements has often been referred to by company executives. How much money would be saved by a uniform system of regulation can only be estimated. Certain it is that the discord engendered by the differences in the state laws does not promote efficiency and that a uniform set of regulations would go a long way toward reducing the expense of conducting the insurance business and ultimately, therefore, toward reducing the cost to the public.

A measure of uniformity in insurance legislation has, however, been obtained through the efforts of the National Convention of Insurance Commissioners, an organization of state supervisory officials organized for the purpose of discussing problems of mutual interest and conferring with respect to their regulatory problems from a national point of view.

### *Anti-discrimination*

A word or two may not be out of order with respect to Mr. Hobbs' comments upon anti-discrimination laws, with particular reference to his statement that

"The principle that all persons are entitled to equal treatment by insurance companies is the natural concomitant of the doctrine that insurance is a business public in its nature."

Many statutes prohibit the employment of unfairly discriminatory rates. It is, however, at times a perplexing question as to when a discrimination ceases to be fair and becomes unfair. It surely was not intended that all persons should receive equal treatment irrespective of the character of the hazards of their

risks and the above quotation is not to be interpreted in that light. Then again, the term "hazards" has often been subjected to close analysis. Does it connote merely a risk's physical hazards? Possibly at the time of the enactment of many of the state laws, underwriters depended, mainly, if not exclusively, on the evaluation of physical hazards in rate making. More recently, however, especially in workmen's compensation line, consideration has been given to a risk's past experience as disclosed by an experience rating plan for determining the hazards under observation. Indeed, the laws of a number of states, California, Georgia, Delaware and Pennsylvania, for example, take official cognizance of the merit rating plans in vogue in the workmen's compensation line.

In addition to rate variations depending upon the "hazards" disclosed by the application of a schedule evaluating a risk's physical features and a merit rating plan for measuring its general "desirability" or "undesirability," distinctions in rates are made for the presence or absence of clauses in the policy contracts affecting the extent of the carriers' net liability. The use of such clauses as the deductible collision clause or the monthly reducing clause in connection with automobile insurance has generally been regarded as calling for rates different from those applied to other forms of automobile contracts.

In recent years attention has been directed towards the expense factor in insurance rate making as perhaps justifying additional differences in rates. An insurance rate may be subdivided into a "pure premium" and a "loading." Differences in the "pure premium" may be expected to provide for variations in hazards and in policy contracts. A variable "loading" can likewise reflect differences in the expense of conducting the business. Of the various factors entering into the "loading" the allowance for commissions is perhaps the most readily determinable and most important. Differences in the rates of commission paid for various lines of insurance or even for classes of risks in a given line are reflected in the corresponding insurance rates. It is a more difficult problem to weigh the differences in some of the other items composing the loading factor such as "home office supervision" and "inspection of risks." On the question of graduating the expense loading in the workmen's compensation line by size of risk, the interested reader is re-

ferred to Mr. Hobbs' comments on pages 16, 17 and 18 of his "Report Relative to the National Council on Compensation Insurance made to the National Convention of Insurance Commissioners" under date of December 9th, 1924.

In other words, the determination as to whether or not a discrimination in rates is unfair may at times become a complicated matter involving, or coming close to involving, questions of adequacy and reasonableness of rates.

### *Reinsurance Business*

It has been heretofore generally held that a state's interest in rating matters could properly be confined to the direct insurance relationship of the carriers and their policy holders. Little, if any, attention has been given in rating laws to reinsurance agreements between companies. In particular the New York Rating Law neither expressly includes or excludes reinsurance business from its jurisdiction. From time to time, it has been alleged that the absence of such regulation presents a loophole calling for legislative action. The possibility has been cited of a group of Insurance companies designating one of their number to operate at other than "board" rates while the remaining members of the group employ "board" rates but accept nevertheless reinsurance lines from the "non-board" company. Such an arrangement would encourage the use of unfairly discriminatory rates, large assureds being referred to the "non-board" company to be accepted at its rate level with the understanding that the line would be reinsured in whole or in major part in the "board" companies. Aside from the specific use of discriminatory rates as alleged above, the question has been raised whether a company which accepts through reinsurance, business at a rate level other than that employed by it for direct insurance, is not employing two rate levels in violation of the laws of such states as require the filing of a schedule of rates and adherence thereto.

Some company organizations have regulated their members' reinsurance activities to the extent of prohibiting their reinsuring the business of non-member companies. Aside from this indirect and limited control of rates probably inspired more by the desire to discourage this form of assistance to non-member companies than to maintain uniform rates, little restriction has

been placed by company organizations upon reinsurance underwriting practice. Furthermore, no control has been exercised over commissions on reinsurance business so that a given gross premium can be readily adjusted through the commission payment to yield an agreed upon net premium for the sake of accommodating a particular insured, broker or insurer. It is not to be expected that regulation of the complicated problems arising in reinsurance underwriting will be entered upon lightly or hastily. In such states as permit the companies to employ discounts from or surcharges to "board" rates, restriction upon reinsurance agreements might deprive such companies of an adequate reinsurance market.

This problem too, is therefore not without its complications.

### *Inter-State Risks*

State insurance laws are generally applicable specifically to risks located within their boundaries. In view of the heterogeneous character of the state laws an assured often finds itself subject to different degrees of regulation in the various states in which it transacts business. It has been charged that upon occasion liberal discounts have been permitted on portions of risks located in non-regulated states to offset the requirements upon the portions in the well regulated states. Such a course of action not only constitutes an evasion of the spirit of rate regulation but reacts against the states with the higher requirements, the business of men of the latter being held to a rate level higher than that required of their competitors in the adjoining states. The importance of the item of insurance cost has been attracting attention of late, especially in the automobile line and consideration has been paid to the competitive advantages possible under differences in state regulation. These differences have been so marked as to encourage underwriters to hope from time to time for a national rating system operating with the sanction of public authorities. It is hardly to be expected, however, that such relief is to come from the federal authorities so long as the decision of the United States Supreme Court holding that insurance is not a commodity and, therefore, is not subject to inter-state regulation, stands. Stress must therefore be laid upon the already mentioned activities of the

National Convention of Insurance Commissioners towards encouraging uniformity in state regulation and upon the efforts of the rate making organizations to control their membership nationwide where permitted by law.

### *Regulation of the Fire Insurance Line*

In addition to the many details of state regulation of insurance rates as presented by Mr. Hobbs, there are several special features of this regulation as applied to the fire insurance line, that are perhaps worthy of special reference.

### *Valued Policies*

The first of these is the attitude of the various states towards what are known as "valued" policies. From the standpoint of the degree of protection they offer, insurance policies fall into two classes—those which seek to indemnify the policy holder to the extent of the value of the loss suffered and those (not so often met with as the first class) which provide for the payment of a stipulated sum on the occurrence of a certain contingency irrespective of the actual value of the loss sustained at the time. A common example of the first of these policy forms is to be found in the automobile collision insurance clause wherein it is provided that

"The Company shall not be liable beyond the actual cash value of the property at the time any loss or damage occurs and the loss or damage shall be ascertained or estimated accordingly, with proper deduction for depreciation however caused, (and without compensation for the loss of use of the property), and shall in no event exceed what it would then cost to repair or replace the automobile or such parts thereof as may be damaged with other of like kind and quality; such ascertainment or estimate shall be made by the Assured and the Company, or if they differ, then by appraisal as hereinafter provided."

A common example of the second of the above classes is to be found in the life insurance contract, where the carrier agrees to pay the face amount of the policy (subject, of course, to adjustments on account of unpaid premiums, dividends and interest) upon the occurrence of the eventuality insured against. There

is here no question as to whether the deceased (if the contingency insured against was "death") was overinsured for the life insurance contract is not a contract of indemnity.

The coverage provided by the standard fire insurance policy of the state of New York falls within the first of the above classes, the insuring clause thereof reading:—

"In consideration of the stipulations herein named and of.....dollars premium does insure  
 .....  
 .....  
 and legal representatives, to the extent of the actual cash value (ascertained with proper deductions for depreciation) of the property at the time of loss or damage, but not exceeding the amount which it would cost to repair or replace the same with material of like kind and quality within a reasonable time after such loss or damage, without allowance for any increased cost of repair or reconstruction by reason of any ordinance or law regulating construction or repair and without compensation for loss resulting from interruption of business or manufacture, for the term of .....  
 .....  
 from the.....day of.....  
 ....19..... at noon, to the.....  
 .....day of.....  
 ....19..... at noon, against all **DIRECT LOSS AND DAMAGE BY FIRE** and by removal from premises endangered by fire, except as herein provided, to an amount not exceeding..... Dollars, to the following described property while located and contained as described herein, or pro rata for five days at each proper place to which any of the property shall necessarily be removed for preservation from fire, but not elsewhere, to wit:."

In Arkansas, however, the amount of insurance stated in the policy becomes in the event of a total loss, the liability which the insurance company is to meet irrespective of the actual value of the property destroyed at the time of fire. In other words, the value of the property at the time of total loss is fixed at the face amount of the policy. This form of statute is quite popular throughout the West and South of the country, approximately



half of the states of the Union having enacted laws of this sort. Its aim is generally considered to be a desire to prevent overinsurance on the part of agents. It was feared that some agents were overinsuring property and extracting from the public premiums in excess of those required for adequate protection. In behalf of the valued policy laws it has been stated that companies are thereby urged to be careful to adjust the amount of insurance to the value of the property covered. As against such laws, it has been argued that they would encourage overinsurance since the carriers are not in a position to inspect and reinspect all risks with a view to adjusting the insurance to the value of the property without incurring considerable expense.

#### *Anti-Coinsurance Laws*

For many years fire insurance underwriters have where practicable, differentiated between policyholders who carry adequate insurance and those who insure only a small percentage of their property. Where partial losses predominate, the latter class of policyholders are able to obtain as much actual protection as the former and at less cost. To offset the situation coinsurance clauses have been introduced in fire insurance policies to automatically relate the carriers' liability to the proportion of the value of the property insured at the time of the fire. A typical coinsurance clause in New York state provides that:—

“If at the time of fire the whole amount of insurance on the property covered by this policy shall be less than 80 per cent. of the actual cash value thereof, this Company shall, in case of loss or damage, be liable for only such portion of such loss or damage as the amount insured by this policy shall bear to the said 80 per cent. of the actual cash value of such property.”

However, a number of states view with disfavor the use of coinsurance forms, probably because their application introduces a “correction factor” in the amount of insurance and may thus penalize an insured in the time of urgent need. Thus, the states of Arkansas, Florida, New Hampshire and Ohio prohibit the employment of coinsurance clauses covering buildings. Other states such as Indiana, Kentucky, etc., leave it optional with the insured to accept or refuse a coinsurance clause. Where the use of coinsurance forms is optional, fire underwriters usually

make an allowance in rate for their employment. An extreme case of such rate differential is to be found in the action of a rating organization controlling one of the side lines written by fire insurance companies in establishing a 900% surcharge for the non-use of its coinsurance provision.

*Standardization of Underwriting Practices and Rating Forms*

Attention should be called to the movement now on foot in the fire insurance lines towards effecting a standardization of underwriting practices and rating forms throughout the country. There are at the present time about forty-five rating and inspection company organizations concerned with fire insurance underwriting. Some of these organizations are confined to individual cities; others function for entire states or large sections of states while still others function for groups of states. Numerous differences in their methods of operations extending to the very nature of the schedules employed by them are also apparent.

The National Board of Fire Underwriters with which are affiliated the majority of fire insurance companies doing business in the United States, has appointed a committee to cooperate with the National Convention of Insurance Commissioners to bring about this much desired standardization. The results of this Committee's deliberations are being looked forward to with great expectation although the obstacles in its way are not to be minimized.

AUTHOR'S REVIEW OF DISCUSSIONS

MR. CLARENCE W. HOBBS:

The discussions submitted by Messrs. Mowbray and Pike on my paper "State Regulation of Insurance Rates," are phrased in such kindly terms and present so little evidence of divergence in opinion, that I am hardly justified in doing more than to express my sincere appreciation of both discussions and adding a word as to one or two points presented.

1. Mr. Mowbray quotes the phrase "Now adequacy for rate making purposes is determined by taking the aggregate loss experience of the carriers concerned and the aggregate expenses, and comparing the results with the rates," and questions whether this can be accepted as it stands. On this point he is quite cor-

rect. The statement was not intended to be more than a general indication of the data by which adequacy is determined, and is far from a complete picture of the entire process of determining adequacy. The experience data as they stand indicate no more than what has been the experience of the past series of years. A comparison of these data with the rates shows nothing more than whether those rates would for that series of years have yielded an excess or produced a deficiency of premium. It is of at least equal importance to determine whether the conditions then experienced now prevail or will prevail in the immediate future; for to these present or future conditions rates must be adjusted. The experience record to be sure if sufficiently extensive and properly analyzed may yield valuable clues as to the trend in loss ratios, and such trends should undoubtedly be taken into consideration. If the changes in loss ratios can be definitely and closely linked up with the business cycle, a long step forward will have been taken towards the goal of a compensation rating system which adjusts itself with speed and accuracy to the ever varying conditions of the business. Hence, the study which Mr. Mowbray refers to is of great importance.

It may be added that supervising authorities have not refused to permit pure premiums to be adjusted for rate making purposes by means of factors designed to bring rates to the average level indicated by assumed future conditions. The possibility of a rate revision coming to the attention of the courts is, of course, by no means remote, and the criteria which will be applied by them not at all certain. It may, however, be doubted if a court would confine itself solely to the experience record, and not take into consideration such very pertinent elements as whether the experience shows that loss ratios are progressively increasing or decreasing. Undoubtedly, in looking to the future, the courts would desire that any theory of trends should be backed up and supported by a convincing background of fact. It is to be hoped, that before emergency arises, Mr. Mowbray's investigation may be able to supply this background.

2. Mr. Pike suggests the preparation of a table presenting a concise summary of the insurance statutes of the forty-eight states. Certain publications have at one time or another prepared summaries of what they consider the leading points of the several insurance codes, or at least the points of most practical

use to their subscribers. In the preparation of these summaries, however, there is an abundant opportunity either for error in interpretation or for error of omission, so that their practical utility is on the whole slight. As a rule, the value of a summary is about in inverse proportion to its conciseness. A more valuable work would be to prepare a compilation of the insurance laws with annotations, indexes and cross-references, so that the corresponding laws in the several states could be readily assembled and compared. Several states issue well edited and complete indexes of the insurance law, but quite a number leave much to be desired both in the compilation and the indexing.

3. Mr. Pike has given some attention to the statement "The principle that all persons are entitled to equal treatment by insurance companies is the natural concomitant of the doctrine that insurance is a business public in its nature." He points out very justly that it must not be inferred that persons are entitled to equal treatment irrespective of the character of their risks, and further that physical characteristics are not the only elements of hazard which should be taken into consideration. He refers to differences in hazard measured by past experience, differences produced by variations in the insurance contract, differences in expense. Undoubtedly, all these may properly be reflected in the rate without producing legal discrimination. One may go a step further and state that no two risks are precisely the same in hazard. The ordinary language of the anti-discrimination law is to inhibit discrimination between risks of the same class or involving the same hazards. In the absence of positive regulation, the only limits on a company's power to classify its risks or to recognize differences in hazard are those established by the rule of reason. One prominent underwriter has stated the anti-discrimination law is a dead letter. It is not quite that, but its possibilities are distinctly limited, and we have seen the states extend the principle of this law by attempting to regulate classifications, determine uniform policy forms, and delve into the practices of companies and rating organizations in assigning risks to classes and in a word into all the detail of rate making and rate administration. Mr. Pike points out that the problems of discrimination and the problems of adequacy and reasonableness of rates are very closely allied and this point is unquestionably well taken.

One would like to go into the points raised by Mr. Pike's very illuminating comments upon reinsurance, uniform state laws and the effect of the valued policy law and the anti co-insurance law as affecting fire insurance, but this opens up such a spacious field that no casual notice can do them justice.

## AUTOMOBILE RATE MAKING—H. P. STELLWAGEN

VOL. XI., PAGE 276

## WRITTEN DISCUSSION

MISS M. E. UHL:

In presenting his paper, "Automobile Rate Making" at the last meeting of the Society, Mr. Stellwagen has rendered an important service to students of automobile insurance. He has given a very complete, clear and detailed exposition of the method of rate making developed by the Automobile Department of the National Bureau and employed in the rate revisions of 1923 and 1924. (I might add here that the method used in the 1925 revision is essentially the same as that for the two preceding years). While a considerable amount of literature dealing with workmen's compensation insurance is now available, very little has been written on the subject of automobile insurance from a strictly actuarial point of view. Mr. Stellwagen's paper is, therefore, peculiarly valuable and timely.

The problem of automobile rate making has, of course, increased in importance rapidly in recent years with the demand for this type of insurance which accompanies the increased use of the automobile. To meet this situation, a system of automobile rate making has been developed which is believed to be as sound as the body of available statistics permits. The methods in use at the present time already compare favorably with those employed for workmen's compensation insurance.

Mr. Stellwagen has described so fully the development in automobile rate making up to the date of his paper that there remains very little opportunity for discussion of the paper itself. I shall therefore merely attempt to supplement what he has written by a few comments which may be helpful to those who study this subject.

In the first part of Mr. Stellwagen's paper he makes a brief reference to the Automobile Statistical Plan. I should like to point out here that the territorial schedules given in the automobile manual to which rates are actually assigned have never been in complete agreement with the territorial divisions for which experience is accumulated under the Automobile Statistical Plan. In the beginning a comparatively few manual territories were set up based almost wholly upon judgment. Later the Automobile Statistical Plan was formulated and the country was divided into many independent statistical territories upon the basis of judgment with the idea that the existing manual territories would be justified by statistics accumulated or that more and different manual territories could be set up where the statistical evidence indicated the necessity therefor. The manual territories have subsequently increased until at the present time there are about as many manual as statistical territories with a troublesome lack of coincidence in many cases between the assignments under the statistical codes and those in accordance with the manual. For instance, in the automobile manual the city of Rochester in Monroe County, New York, together with ten adjacent townships is defined as "Rochester territory" and assigned to a certain rate schedule. The manual defines "Rochester suburban territory" as the remainder of Monroe County with the exception of three townships which are assigned to the "Remainder of state" territory schedule. Thus, the manual provides three territory schedules within Monroe County, New York. But the statistical plan provides two territorial divisions for Monroe County, namely, "Rochester city territory" comprising the city of Rochester alone (not including the ten adjacent townships as in the manual) and the remainder of Monroe County which is coded as "Rochester surrounding." The inconvenience of this disagreement between manual and statistical territories is obvious. There no longer exists any reason for discrepancy between the manual and statistical territories. It has accordingly been decided that beginning with policy year 1926, the manual and statistical territories will be made to coincide.

Further on in Mr. Stellwagen's paper, he explains the treatment of the incomplete policy year used in the rate making process. He points out that the factor applicable to the immature experience is a combination of an earned factor and a decreasing

cost factor. Obviously, it is not possible to estimate exactly what the earned factor would be unaffected by decreasing or increasing cost. It is, of course, necessary to take into account the element of increasing or decreasing cost. As long as costs decrease or increase uniformly year by year there is no danger involved in using approximately the factor as calculated. However, if a period of decreasing costs should be followed abruptly by one of increasing costs, or vice versa, the development of the experience for the incomplete policy year would not be similar to that of the preceding year and the adjustment of pure premiums and indicated rates (see steps 3 and 9 under heading "Derivation of Average Territorial Rates" described in Mr. Stellwagen's paper) would be out of line. Fortunately, the use of the ultimate factor as described has worked out very satisfactorily thus far, and the uncertainty involved in the use of the factor is perhaps more than off-set by the advantage resulting from the use of the later experience.

The second step in the process of establishing territorial rates as described in the paper under discussion consists of the selection of pure premiums with regard to trends and local conditions. This step consists of a study of the territorial pure premiums for each of the policy years used in the experience together with the average pure premiums for all years and the selection of a pure premium for each territory. Mr. Stellwagen states that in the selection of pure premiums, "particular attention is paid to trends in the experience." It occurs to the writer that as a possible refinement of the work at this point, a definite system of weighting might be introduced, assigning greater weight to the pure premium of the later years. For instance, where the experience of three years is used, weights of 1, 2, and 3 might be applied to the experience beginning with the earliest year in order to take account of the trend in a uniform way for all territories. In this connection, Mr. Stellwagen states that "consideration is also given to any local conditions of recent development." This consideration enters into the process of selection when, for instance, a recently organized and well established safety movement is functioning. In such a case the experience developed during the years before the safety organization was established might be entirely disregarded. I believe, however, that such instances are not sufficiently frequent as

to seriously interfere with the operation of a weighting scheme in the general procedure.

With the rapid growth of the business of automobile insurance and with the introduction of the principle of compulsory insurance, more and more attention will certainly be given to the scientific development of rates for this line of insurance. The situation at the present time as respects automobile rate making should be regarded as very favorable inasmuch as the methods have already at this comparatively early date been developed on a sound actuarial basis.



## REVIEWS OF PUBLICATIONS

RALPH H. BLANCHARD, BOOK REVIEW EDITOR

*Principles and Methods of Statistics.* Robert Emmet Chaddock  
Houghton Mifflin Co., New York, 1925. Pp. xvi, 471.

Prof. Chaddock labels this book in his preface "an introductory text for general use in colleges and universities." His point of view in approaching his subject is "logical and empirical rather than mathematical." His reason for this is that "A large number of technical and mathematical books on statistical methods have appeared in recent years. The author recognizes the value of these for the highly specialized student but doubts their utility for the beginner in the subject. The need at present is a clear understanding of fundamental principles in the treatment of numerical data." These quotations will make clear at once the general character of this latest (within the reviewer's notice) of the many recent treatises on statistics.

The book is divided into three parts with the addition of five appendices. Part I is introductory and devoted to Preliminary Considerations. Here are two chapters, the first on The Appeal to Facts and the third on Statistics in the Service of Science which present general considerations on the need and the nature of the statistical method which are along rather usual lines. The second on Misuses of Statistical Data is unusual in such a treatise but strikes a much needed note for statistical training and practise of insistence on a critical and scientific attitude not only in handling statistical material but in interpretation or inference therefrom. This excellent point of emphasis brought out especially in this chapter is repeatedly stressed throughout the book.

Part II, entitled Classification and Description of Mass Data, constitutes the bulk of the book, 325 of its total of 471 pages. After a brief chapter of general observations on classification of statistical data, this part takes up in detail the subjects of frequency distribution, the arithmetic mean, the median and geometric mean, the mode, variation, index numbers, measurement of unreliability, correlation, and time series, in that order.

Part III, on Gathering and Presentation of Statistical Data, in three chapters considers collection of statistical data, tabular

presentation, and graphic representation. To the mind of the working statistician the subjects in Part III would logically precede Part II, but Prof. Chaddock explains his arrangement as one that he has found by trial to be preferable for teaching purposes as students usually have had no experience in methods of collecting data but usually have come into contact with statistical data as used in the ordinary sources of such material.

Five appendices present an alphabetical list of the selected references given at the close of each chapter, a summary of statistical symbols, equations and formulae used, and reprints from Rugg's *Statistical Methods Applied to Education* of three tables for computing certain factors in equations and formulae.

It is not an easy matter to write a text book on statistics that is always clear in definition and description but Prof. Chaddock's book is notably successful in this respect. It bears at all points evidence of the perfecting of its matter in the exacting tests imposed by the necessity of clarity in class room use. Constant illustration of points by examples drawn from familiar experience and building up step by step from simple to more complex propositions are notable points of style throughout.

As above noted, this is designed for an elementary text-book for teaching. The present reviewer is not prepared to appraise it for class-room technique. But from the field of practical statistical work, he has gathered a very favorable impression of its substance and spirit as calculated to afford at once both fundamental and practical training for statistical work. It seems to him a first class elementary manual for the working statistician, affording in the first place most of the reference matter on technique which a statistician ordinarily needs for refreshing his memory as to method, and in the second place ever recalling the necessity for an exacting critical and scientific attitude in all statistical work.

LEONARD W. HATCH

*Elementary Statistical Methods.* William G. Sutcliffe. McGraw-Hill Book Co., New York, 1925. Pp. xvii, 338.

This text is designed to furnish to those interested in the subject of statistical control in the business sciences, an exposition of the development of elementary statistical methods involved in such control. In an attempt to give the reader a better

understanding and appreciation of the several types of analysis rather than the several types of formula, Mr. Sutcliffe in the presentation of his subject has reduced to a minimum the space allotted to the mathematical derivation of formula and the use of higher mathematics. On the other hand he has stressed instead the application of the science of statistics.

The text contains numerous quotations from other texts, and at the end of each chapter a list of references bearing on the particular phase of the subject discussed is presented. A number of questions are also presented at the end of each chapter which enables the student to test his ability in the practical application of his theoretical knowledge.

Part I presents no departure from the usual method of placing the subject of statistics before the reader, although the order of presentation is a distinct improvement over the majority of other texts in the field. Having introduced the reader to the subject and explained the technique by which statistics are compiled and put in shape for analysis as well as graphic methods of presentation, Mr. Sutcliffe devotes Part II to "Statistical Methods for Frequency Series," in which he explains what a frequency series is, the classification and tabulation of such series, and proceeds to an explanation of the methods by which these series may be analyzed and interpreted.

Part III is given over to a study of "Statistical Methods for Time Series." After treating time series and index numbers the author proceeds to a discussion of seasonal variation, secular trend and cyclic fluctuations, and completes the text with a chapter on "Business Barometers," which is a sort of rounding off of the entire discussion.

In his discussion of the mode, Mr. Sutcliffe uses the term "moving average" in finding the mode of a bimodal series. While the author is technically correct in employing the term "moving average" in this connection it may be misleading to the student since the process involves merely the enlarging and shifting of the class interval until the mode or an approximation thereto is found.

Several errors appear in the book which are probably typographical in character. On Page 138, in discussing the formula for computation of the mean, the author refers to small "v" in the formula as large "V". On Pages 156 and 157, in discussing the mode of the series found in Table XXXVII, confusion

arises through a wrong numbering of the columns. The column headed "Frequency" apparently should be numbered (1) and the other columns in sequence.

The arrangement is in general very good, leading the reader logically from point to point. As a detailed exposition of the subject it falls some distance short of adequately filling the long felt need of a satisfactory text book covering the elements of statistics. It does however possess a real and genuine merit, in that the manner of presentation is calculated to interest beginners in the subject of statistics, and in this it excels most of the text books now in the field.

W. F. ROEBER

*Mathematics of Life Insurance.* L. Wayland Dowling. McGraw-Hill Book Co., New York, 1925. Pp. x, 121.

This book is an addition to the already rather long list of books dealing with the elements of actuarial science. In his preface, the author (on whose lectures in the University of Wisconsin the work is based) states that the book "is intended primarily as a first course for those . . . who wish to become trained actuaries; or as a final course for other students who desire an elementary knowledge of the fundamental mathematical principles" underlying insurance. The development of the subject is consistent with this statement and the necessity for brevity is clear, when it is understood that between the covers of this small book we have chapters on Interest and Annuities Certain, Probability, Morality Table, Net Premiums and Reserves, Policy Options, Joint Life Functions and Theory of Error. The academic nature of the work is exemplified in the description of the method of loading premiums or of calculation of non-forfeiture options on terms policies, as well as in the lack of qualification in such a statement as that "the American Experience Table understates mortality by something like 40%." The selection of material, however, constitutes a logical development of the subject and should serve as a very suitable framework for a more advanced study, although a list of references would perhaps have been helpful to some students. The notation for the most part is standard and the book is, in all respects, typographically agreeable. Appended is a short collection of actuarial tables.

JOHN S. THOMPSON

*Practise of Workmen's Compensation Insurance.* Saul B. Ackerman. The Spectator Company, New York, 1925. Pp. vii, 196.

It is next to impossible to enjoy reading a primer on any subject unless the reader happens to be in the primer class. Mr. Ackerman's book on the "Practice of Workmen's Compensation Insurance" has been made so studiously simple that the reviewer could not truthfully state that he enjoyed reading it which probably is tantamount to saying that Mr. Ackerman was successful in his endeavor.

The author covers the field of workmen's compensation insurance as it is conducted in the state of New York very thoroughly. He reviews briefly the necessities for and tendencies of compensation legislation, gives his impression of how claims should be investigated and adjusted, as well as a description of the functions of the other services which should be rendered to the assured and injured. Besides describing the Universal Standard Workmen's Compensation policy, he carries the reader through the various stages of manual rate making and modification to fit the individual risk by the application of the various rating plans. The concluding chapters are given up to description of the various types of insurance carriers.

Fortunately, or by commendable design, as the book progresses, Mr. Ackerman has allowed himself a little more rhetorical latitude, which makes the latter portion of the book, which by natural process of the development of the subject becomes a little more complicated, much more easy to read and therefore more comprehensible.

If the foregoing has been an indication that the "Practice of Workmen's Compensation Insurance" will not prove a valuable addition to the library of any one interested in compensation insurance, such thoughts must be dispelled at once because Mr. Ackerman has clearly demonstrated a very close contact with every phase of the Compensation business although it is equally clear that his contact has been limited to, or possibly it might better be said, has been intimate with workmen's compensation practice in New York state.

There are several points in connection with Mr. Ackermans'

treatment of his subject that might well be discussed at somewhat extended length but immediately it would carry the implication that Mr. Ackerman's book was intended to be of the more profound variety instead of the more elementary, and it is the writer's belief that it was intended to be elementary and, therefore, that any discussion based upon any other premise would be unfair to the author.

SANFORD B. PERKINS

## CURRENT NOTES

S. D. PINNEY, CURRENT NOTES EDITOR

Acknowledgment is made with appreciation to Messrs. L. L. Hall, W. F. Roeber, and L. M. Mauro for their assistance in the preparation of these notes.

## WORKMEN'S COMPENSATION INSURANCE IN ITALY

The following notes dealing with workmen's compensation insurance in Italy have been translated by Mr. L. M. Mauro from a report submitted by Signor Guido Toja, Director of the Italian Insurance Institute, and a Fellow of this Society.

The administrative, technical and financial organization of the National Insurance Institute dealing with accidents in the agricultural field is radically different from that part of insurance which deals with industrial accidents. We must bear this fact in mind in order to appreciate the methods followed in the collecting of statistical data regarding accidents, cost, etc., in agricultural and industrial enterprises, and the criteria followed in the determination of workmen's compensation insurance rates.

## CHAPTER I

## WORKMEN'S COMPENSATION INSURANCE IN THE INDUSTRIAL FIELD

This branch of insurance is regulated by the Act of 1904 subsequently modified by Royal decree under date of November 17th, 1918, and by the Act of March 20th, 1921. In order to have a clear idea of the methods followed in the calculation of workmen's compensation insurance rates, it is essential to make a few brief remarks regarding the nature of the accidents which workmen's compensation insurance covers. The Italian Workmen's Compensation Act provides indemnity for death or bodily injuries sustained by an employee in the course of his employment whenever such injuries incapacitate the injured party for a period of over five (5) days. The amounts provided by law for the various kinds of accidents are:

1. For permanent total disability an amount equal to six (6)

yearly salaries with a minimum compensation of 6000 *lire*\* and a maximum of 36000.

2. For permanent partial disability an indemnity equal to six (6) times the reduction of the yearly salary, such a yearly salary never to be considered as less than 1000 *lire* per annum.

3. For death the indemnity shall be equal to five (5) yearly salaries with a minimum of 5000 *lire* and a maximum of 30000 *lire*.

4. For temporary total disability the daily indemnity shall be equal to one-half the wages which the injured was earning and such amount shall be paid during the entire period of such disability.

5. In the case of permanent disability other than indemnities mentioned in No. 1 and No. 2, the insurance carrier must pay indemnity for temporary total disability during the entire time in which the injured employee must absent himself from work, with a maximum indemnity of three (3) months from the time the accident occurred. Within two (2) years after the occurrence of an accident the injured party or the insurance carrier may request a revision of the case in the event that the settlement of the claim is found to be in error or whenever the injuries sustained by an employee have caused further complications.

The civil responsibility of an employer toward his employees is only recognized when it is found that the accident is due to negligence on the part of the employer or his representatives.

Workmen's compensation insurance in Italy is competitive. Insurance may be written by (a) the National Insurance Institute, a body created by law on July 8th, 1883, and which later became an organization of the government, (b) by private insurance companies, (c) by mutual associations of employers or insurance syndicates, (d) by private associations organized by single industrial establishments for the exclusive benefit of their own employees.

Insurance organizations which come under the (a) and (b) groups cannot write insurance without the authorization of the government. Such authorization is given after the insurance organization has furnished adequate bonds as to its financial soundness. The organizations coming under groups (c) and (d) furnish similar bonds and can only exercise the right of insuring their employees when the number of such employees is above 500.

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(\*NOTE: The U. S. par value of the *lira* is 19.3 cents.)



At the present time, other than the National Insurance Institute, there are in Italy eleven (11) private insurance companies, fifty-one (51) mutual associations and eleven (11) self-insuring establishments.

## CHAPTER 2

### ACCIDENT STATISTICS AND RATE MAKING PROCEDURE

The National Insurance Institute, private insurance companies and other bodies mentioned in the foregoing chapter are free to compile their own accident statistics or experience in the manner in which they see fit, and establish their own rates. The insurance rates, however, do not differ widely from carrier to carrier as will be shown later.

#### 1. *Compilation of Accident Statistics.*

At the present time neither the government, the National Insurance Institute, or private companies are compiling statistical data regarding industrial accidents on a sound scientific basis. Because of the lack of statistical data the basic rates of the National Insurance Institute during the twenty (20) years since workmen's compensation insurance has been obligatory have not been revised on the basis of experience in the Kingdom of Italy. The National Insurance Institute as well as the Secretary of National Economy, however, have gathered and are gathering important statistical data on the subject. These data are obtained as follows:

The Secretary of National Economy maintains a Statistical Bureau which receives a complete report for each industrial accident. Such a report must be filed by the Statistical Department of the National Insurance Institute or any other insurance organization operating in the kingdom. The main reason why such a bureau has been created is to furnish all of the insurance carriers with complete information relative to the injuries sustained by an employee, thus avoiding the possibility of fraudulent claims for injuries received at a previous time and for which a settlement was made. The government also desires to keep complete record of all industrial accidents for statistical purposes. Schedule "Z" blanks are furnished to all the insurance carriers

for this purpose. Even when compensation is denied to an injured employee a report of the accident must be filed.

## 2. *Rate Making Procedure*

The basic rates of the National Insurance Institute were approved by the government in 1903 and substantially modified later in the year when the compensation act was amended as respects the obligatory insurance clause. As obligatory insurance had only been in effect for four (4) years, the data collected by the National Insurance Institute were rather limited and could not be used, therefore, as the basis for new manual rates. Only the data pertaining to temporary disability were of some value since such injuries occur with sufficient regularity even when the risk class does not cover a large number of employees.

Because of the lack of sufficient data, it was necessary to utilize all of the information available in foreign countries, particularly Germany and Austria. In these latter countries a tabulation of industrial accidents was made and published periodically, thus enabling the Italian actuaries to predict with a certain degree of accuracy how frequently accidents in a specific industry occurred.

The basic rates of other insurance enterprises were also carefully analyzed not only with the object of establishing insurance rates for the National Insurance Institute but principally to describe each individual risk or each group of analogous industries. Many other publications were also studied, especially the reports of the International Labor Congresses which contained so much illuminating information on industrial accidents.

Having thus determined through various sources the pure premiums, compensation insurance rates were established. The pure premiums were loaded individually; that is, a certain loading for death, one for permanent disability, and one for temporary disability. For each one of these types of injuries it was not difficult to select pure premiums. In view of the fact that the possibility of abuses and frauds is limited in the case of fatal accidents, the death pure premium was loaded by 2%. For permanent disability cases, on the other hand, since the possibility of frauds and simulations is greater, the loading amounted to 20% while for temporary disability since the indemnity is paid daily and since it only corresponds to one-half of the

daily wages, a loading of 10% was considered sufficient. The loading for overhead expenses and reserves was fixed at 25% of the total wages paid in the form of indemnities. In this manner manual rates were established to cover only the legal responsibility of the employer without any guarantee as to his civil responsibility, but since workmen's compensation insurance policies usually contain a clause which protects the employer against civil claims, it was later decided to revise the basic rates in order to include a civil guarantee, a guarantee which never covers the entire responsibility but only a part of it which never exceeds nine-tenths. A reduction of  $\frac{1}{3}$ % of the basic rate was established for those policies which did not include the civil responsibility clause. This reduction was found adequate since past experience indicated that civil suits had been very limited in number.

The rates selected for the various classifications were many. They were finally reduced to thirty-two (32) different groups.

The selection of pure premiums being based on such a diversity of elements of large approximation, the rate itself is only an approximation of the class risk.

### 3. *Classification of Risks*

In the present manual of rates of the National Insurance Institute the industries are separated into fifteen (15) groups which, if not entirely homogeneous, are sufficiently individualized:

- 1st. Agriculture, breeding of live stock and forestry.
- 2nd. Food, oil, tobacco.
- 3rd. Paper, leather, rubber, printing.
- 4th. Chemicals.
- 5th. Building construction, road making and hydraulic enterprises.
- 6th. Electricity.
- 7th. Clays, ceramics, glassware.
- 8th. Lumber.
- 9th. Mechanic.
- 10th. Metals.
- 11th. Mining.
- 12th. Textiles.
- 13th. Transportation.
- 14th. Clothing.
- 15th. Miscellaneous.

Each group is further divided into a number of subdivisions and for each subdivision, assigned to a specific code number, rates are shown in the manual. The rates are supposed to represent the hazards of the individual risk. The assignment of a risk to a specific code number depends on the presence or absence of power-driven machinery and other mechanical equipment, the kind of raw materials used, the methods of production, the product itself, and the diversity of operations performed by various groups of employees within the plant. In the manual of rates used by the National Insurance Institute, 531 classifications are shown and are distributed into 32 distinct classes of risks. A risk which is assigned to the first class takes a rate of 2.42 *lire* per 1000 *lire* in wages, while a risk assignable to the thirty-second class is charged 291 *lire* per 1000 *lire* in wages.

For example:—Clothing Manufacturing with power-driven machinery is assigned to Group 14, Code 472, Class 6, and takes a rate of 7 *lire* per 1000.

—Ice Manufacturing is found in Group 2, Code 35, Class 22, with a rate of 50 *lire* per 1000.

#### 4. *Rate Making Bodies*

The premiums are established by each insurance organization. However, in view of the very keen competition existing, the difference in the rates quoted by the various insurance carriers is hardly appreciable. Moreover, the rates as well as the conditions existing in the policies must be approved by the Government which may request from any insurance company changes or modifications whenever it is found necessary. All the insurance companies must file with the government their policy forms and table of rates as well as an application to write workmen's compensation insurance. The authorization to write insurance is given after policy forms and rates have been subject to very careful scrutiny. The applications to write insurance are filed with the Department of National Economy. This department is not authorized by law to approve applications but it has the right and the duty to examine them and may deny such authorization or may request that modifications be made in the rates whenever it finds that such rates are not adequate and may defeat the purpose of workmen's compensation insurance.

Mutual insurance syndicates are founded on the principle of

repartition. They exact from the members an anticipated premium determined more or less arbitrarily but calculated finally at the end of the policy year after the overhead expenses and losses have been taken into consideration and after a careful audit has been made of the wages paid to the workers covered.

##### 5. *How Rates Are Quoted*

In the sixth subdivision of this paper the question of whether rates are susceptible to modifications will be discussed. It is essential here to state that the workmen's compensation insurance rates are not so fixed in the sense that the National Insurance Institute or the insurance companies can only apply a specific rate for a particular classification. However, although the insurance carriers have the right to apply different rates from those shown in the rate table, the difference in the rate is always justified by an analysis of the merits or demerits of the risk under consideration, such as the special processes followed in the production of a certain article and the region in which the risk is located; also the attitude on the part of the employer toward the prevention of industrial accidents and so forth. These elements concur to modify the average risk which was used as a basis in the calculation of the rate level for that particular industry.

It must be said also that the change in rates is not infrequently determined by competitive considerations but it is necessary to note that in order to avoid the ill-effects of competition when competition manifests itself by a reckless reduction of insurance rates which would defeat the economical and social aspect of the compensation law, the following regulations exist:

1. The National Insurance Institute has in its Board of Directors representatives of the government as well as employers and employees. The Institute is directly supervised by the government. Its existence is not based on speculation or profit. Its insurance rates are approved by the government and any departure therefrom is limited. The government places thus at the disposal of employers who are obliged to carry insurance an institution which presents the greatest guarantee of financial stability and which by using certain established insurance rates keeps the other insurance organizations within certain limits. The Insurance Institute also cannot decline to insure a risk whatever be its merits or demerits.

2. The insurance companies must obtain the authorization from the government to write workmen's compensation insurance and to obtain this authorization they must deposit a bond which must correspond to two-thirds of the premium collected for each policy year and such a sum must never be less than 500,000 *lire*.

3. The insurance carriers are also under the careful supervision of the Secretary of National Economy to whom they must transmit their balances compiled in the manner required by law, and must furnish all the statistical data that the Secretary may require. The Secretary has also the right to inspect at any time the books of the insurance carriers and whenever it is found that the institution is not properly organized or does not properly function, the Secretary may through Royal decree disband the administration of such insurance organization and place its affairs in the hands of a representative of the government. If the carrier is guilty of a serious offense against the law or governmental regulations, its license to write workmen's compensation insurance may be revoked.

The above regulations tend to obviate or remove the evils which insurance carriers may bring upon themselves and upon others by quoting inadequate insurance rates while the existence of the National Insurance Institute gives an employer the opportunity to buy insurance whenever a private company refuses to write the risk except at rates which are excessive.

#### 6. *Modification in the Basic Rates*

The basic rate is supposed to cover the average risk. Even when the rate should be based on very extensive experience which could only reflect the average risk since there are many circumstances and factors which might change the aspect of the individual risk, such as: organization, management, personnel, methods of production, raw materials, mechanical equipment, and accident prevention. There is also the so-called risk of "environment" which must be taken into consideration and which derives its name from the abuses which manifest themselves in a very extraordinary manner for purposes of speculation, such as: the filing of fraudulent claims, injuries which have been artfully rendered more serious, and claims in which doctors, either through sympathy or in collusion with the claimant, have had

a hand in the filing of such claims and in the collecting of the indemnity.

From the foregoing it is obvious that the basic rate may be either increased or reduced as the risk is superior or inferior to the average risk. In the manual of rates there are certain notes next to each classification which indicate the conditions which may justify this rate fluctuation.

### CHAPTER 3

#### WORKMEN'S COMPENSATION INSURANCE IN THE AGRICULTURAL FIELD

Agricultural workers are covered by the Italian workmen's compensation act. The compensation law does not prescribe that the landholders insure their employees against accidents. It merely provides that all the agrarian workers, including landholders doing manual labor, are "*ipso jure, ope legis*", insured for injuries sustained. It is apparent, therefore, that agricultural workers are automatically insured.

The administrative procedure of this branch of workmen's compensation insurance is entirely different from compensation insurance in the industrial field, and calls for a much different technical and financial organization.

The Kingdom of Italy is for the purpose separated into geographical insurance divisions or districts, comprising one or more provinces.

In this field of insurance there are no competitive situations to consider since private companies or self-insurers are excluded, although some exceptions exist as respects mutual organizations or syndicates which were already in existence prior to the enactment of the law.

The insurance rates are established by the government. They represent an additional charge on the land taxes and are collected by the municipal revenue officer.

Indemnities paid for injuries are not based on the wages of the injured employees since it is frequently the case that such employees are not remunerated in actual money. It is also obvious that it would be very difficult to make accurate audits of the wages paid.

Indemnities vary according to the age and sex of the injured party.

## 1. PERMANENT TOTAL DISABILITY

Age	Indemnity	
	Male	Female
12 to 15 years.....	5400 <i>lire</i>	3600 <i>lire</i>
15 " 23 " .....	7500 "	4500 "
23 " 55 " .....	9750 "	6000 "
55 " 65 " .....	6000 "	3000 "

To these amounts which are paid in installments is added one-tenth for the wife and each dependent child under 15 years of age, or if the injured party is a woman, one-tenth for each child under 15 years of age. The total additional payment shall not exceed, however, 50% of the specified indemnity. Thus the maximum payable to a man is 14625 *lire* while to a woman is 9000 *lire*.

## 2. PERMANENT PARTIAL DISABILITY WHICH REDUCES THE PRODUCTIVE ABILITY OF THE INJURED PARTY MORE THAN 15%

## Indemnity

The indemnity is calculated on the basis of the indemnity established for permanent total disability indicated above, but reduced in the same proportion in which the producing ability of the injured is reduced as result of the accident.

## 3. DEATH

Age	Indemnity	
	Male	Female
12 to 15 years.....	3000 <i>lire</i>	2250 <i>lire</i>
15 " 23 " .....	6000 "	3000 "
23 " 55 " .....	7500 "	3750 "
55 " 65 " .....	4500 "	2250 "

As in the case of permanent total disability, to the specified indemnity one-tenth is added for the wife and each dependent child under 15 years of age, or if the injured party is a woman, one-tenth is added for each dependent child under 15 years of age, but provided that such additional amount shall not exceed 50 % of the indemnity paid. Thus, the maximum indemnity paid under this group could be only 11250 *lire* if the victim is a man or 5625 *lire* if it be a woman.

Indemnity is only paid when the injuries sustained will incapacitate the injured party for more than 10 days in which case the Compensation paid becomes retroactive from the day the accident occurred. No indemnity is paid to landholders, tenants and their wives and children, if the nature of the disability is temporary, but if permanent, landholders and their dependents are also indemnified.

Rates are based on the average number of employees in each



district and are calculated on the basis of past losses or experience for that particular district. The rates include administrative expenses, reserve funds, and 2% of the premium income to be paid to the government for the enforcement and administration of the law. If the past experience has shown a deficit, the rates are augmented accordingly. If a credit, they are reduced. The rates are established by the government and are not subject to any modifications except when complementary or incidental operations are of such magnitude as to change to a great extent the character of the risk.

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#### COMPENSATION EXPERIENCE RATING IN WISCONSIN

On July 1, 1925 by action of the Wisconsin legislature a law became effective which will permit the application of experience rating to compensation risks in the state of Wisconsin. It is interesting to note that the wording of the law is such that it is not compulsory for the Wisconsin Compensation Insurance Board to apply experience rating. During the fall a committee of insurance carriers was appointed by the Wisconsin Compensation Rating and Inspection Bureau to assist the Insurance Board in the formulation of the details of the plan of experience rating which would be most desirable for Wisconsin. In the course of deliberations the Insurance Commissioner, W. Stanley Smith, felt that it would be desirable to submit the various proposals to a conference of employers, insurance representatives and representatives of the Wisconsin Federation of Labor. As far as can be determined, this is the first time that the employers have been called upon to decide a question of this sort and the interest which the employers and representatives of labor took in this question is noteworthy. A committee consisting of representative employers of the state was finally constituted to study the subject and make its recommendation to the Insurance Board. Commissioner Smith in the course of the deliberations of this committee made the statement that he would be largely governed by the recommendations of the committee of employers in his decision as to what plan of experience rating should be adopted in Wisconsin. The employers recommended the National Council Plan with certain minor modifications. It is expected that the plan upon approval by the Wisconsin Compensation Insurance Board will become operative as of July 1, 1926.

ACTUARIAL AND STATISTICAL NOTES  
CREDIBILITY TABLES FOR EXPERIENCE RATING

There are approximately 45,000 workmen's compensation insurance risks in the United States subject to experience rating. As a part of the work of making each one of these ratings, it is necessary to calculate the credibility to be assigned to the difference between the actual and the expected experience. This credibility varies directly with the size and/or hazard of the risk and is determined from the following general formula:

$$\frac{P}{P + K} = Z$$

Where:

$P$  = the risk premium subject to experience rating

$K$  = a constant

$Z$  = the credibility to be attached to the difference between the actual and expected experience

Actually however, in the present plan of Experience Rating, the comparison between the actual and expected experience is divided into two parts. That is, the risk "excess" losses are compared with the expected "excess" losses while the risk "normal" losses are compared with the expected "normal" losses. Furthermore, the credibility attached to difference between the actual and expected "excess" experience is not the same as the credibility attached to differences between the actual and expected "normal" experience and it is therefore necessary to calculate two credibility values for each rating. Accordingly, the general formula is used as

$$\frac{P_e}{P_e + K_e} = Z_e \text{ for the "excess" comparison}$$

$$\frac{P_n}{P_n + K_n} = Z_n \text{ for the "normal" comparison}$$

Where the subscript "e" and "n" denote "excess" and "normal" respectively.

Considering the number of ratings, it was believed that it would not only be possible to save labor but also promote greater accuracy by calculating the values in advance and placing them in tabular form.

First, it might be mentioned that the value of  $Z$  is usually

calculated to three decimal places and while there are 999 possible values, it was found by inspection that there were comparatively few ratings where the  $Z$  value exceeded .600. It is apparent then that a table capable of taking care of the majority of ratings would need to contain only the limiting values of  $P_e$  and  $P_n$  for each three place value of  $Z$  from .001 to .600.

It might also be added that as the values of  $K_e$  and  $K_n$  vary from state to state, it was necessary to calculate a table for each state.

It was found that by rearrangement of the ordinary credibility formula, it was possible to lay out the work sheets in such form as to make certain portions of the calculations applicable for all state tables.

This involved expressing the general credibility formula:

$$P = \left( \frac{Z}{1 - Z} \right) K$$

The calculations of  $\frac{Z}{1 - Z}$  when made for all values of  $Z$  from .001 to .600 are the same for all states and need to be multiplied only by the respective values of  $K_e$  and  $K_n$  to give values of  $P$ .

If however, this exact form were used, the values of  $P$  derived would be the mean values for each value of  $Z$  and as limiting values were necessary, the following modification of the formula

was used  $\frac{Z + .0005}{1 - (Z + .0005)} K = P$ .

The next step was the calculation of a table of values of  $\frac{Z + .0005}{1 - (Z + .0005)}$  for each three place value of  $Z$  from .001 to .600. These were calculated to seven decimal places and were then put in work sheet form thus:

State		$K_e$	$K_n$
1	2	3	4
$Z$	$\frac{Z + .0005}{1 - (Z + .0005)}$	$P_e$	$P_n$
.001	.0015023	$K_e \times \text{Col. 2}$	$K_n \times \text{Col. 2}$
.002	.0025063		
.003	.0035123		
.004	.0045203		
.005	.0055300		

Then to work out a table for any state, it was only necessary to multiply the values in Column No. 2 by the values of  $K_e$  and  $K_n$  for the particular state and enter the results in Columns  $P_e$  and  $P_n$  respectively. These products were carried to two decimal places (cents) and as the partial subject premiums for experience rating are always in dollars only, it was only necessary to drop off the cents column in order to have the limiting values of  $P_e$  and  $P_n$  in dollars for each value of  $Z$ . Where however, the product resulted in even dollars, it was necessary to drop off one dollar otherwise the result would have been the partial premium which would have exactly produced a  $Z$  where the fourth place would have been exactly .0005 and this would have thrown it in the next higher three place  $Z$  group.

It might also be added that at the time these tables were calculated, there were several states still using the 1920 Experience Rating Plan. That Plan used the formula

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

=  $Z_2$  for the comparison between the actual and expected "all other" experience where both  $C$  and  $K_2$  were constants. This formula in form for solution for  $P$  would be:

$$\frac{(Z)}{1 - Z} K - C = P$$

Consequently it was possible to obtain values of  $P$  by deducting the value of  $C$  from products resulting from the multiplication of  $K_2$  by the values in Column 2 of the work sheet.

The tables for each state were furnished to carriers and rating organizations and were reproduced on a single convenient sized sheet with the limiting values  $P_e$  and  $P_n$  opposite each value of  $Z$ . These values of  $P_e$  and  $P_n$  appear as Items 53 and 56 respectively as those are the item numbers for those particular values on the rating sheets. A facsimile of one of the completed tables follows:



## COMPENSATION STATE PREMIUM TAXES AND EXPENSE LOADINGS

The following exhibit has recently been prepared by the National Council on Compensation Insurance and contains the makeup of the state premium tax in the various compensation states as well as the total expense loading and expense multipliers which are applied to pure premiums for the various states.

The first five columns of the exhibit show the makeup of the state premium tax. The normal state premium tax provided for in both the industrial and coal mine loadings is 2%. If the normal state premium tax is less than 2% and the law is retaliatory, 2% is taken as the amount for that particular state, otherwise the amount fixed by law is used without modification. The percentage shown under "City", Column (3), is the ratio of the total amount of city taxes paid to the entire premium writings of the state. Column (4), headed Miscellaneous, includes additional tax to cover such items as expenses of Industrial Commission. There is also shown a comparison by parts of the expense loadings used in the 1920 Revision and those used at the present time.

**WORKMEN'S COMPENSATION INSURANCE STATE PREMIUM TAX AND EXPENSE LOADING**  
(Corrected to January 1, 1926)

State	"State" Premium Tax					Total Expense Loading		Expense Multipliers	
	State %	Retal-atory	City %	Misc. %	Total %	Industrial %	Coal Mine %	Industrial	Coal Mine
Alabama.....	2.	no	.7	..	2.7	40.7	34.7	1.686	1.531
Alaska.....	2.	no	..	..	2.	40.	34.	1.667	1.515
Arizona.....	2.	yes	..	..	2.	40.	34.	1.667	1.515
California.....	2.6	yes	..	..	2.6	40.6	34.6	1.684	1.529
Colorado.....	2.	no	..	..	2.	40.	34.	1.667	1.515
Connecticut.....	2.	yes	..	..	2.	40.	34.	1.667	1.515
Georgia.....	1.5	no	1.	3. (a)	5.5	43.5	37.5	1.770	1.600
Hawaii.....	2.	no	..	..	2.	40.	34.	1.667	1.515
Idaho.....	2.	no	..	..	2.	40.	34.	1.667	1.515
Illinois.....	2.	yes	..	..	2.	40.	34.	1.667	1.515
Indiana.....	1.2	yes	..	..	2.	40.	34.	1.667	1.515
Iowa.....	2.5	yes	..	..	2.5	40.5	34.5	1.681	1.527
Kansas.....	2.	yes	..	..	2.	40.	34.	1.667	1.515
Kentucky.....	2.	no	..	..	2.	40.	34.	1.667	1.515
Louisiana.....	1.8	no	..	..	1.8	39.8	33.8	1.661	1.511

Note: (a) For expenses of the Industrial Commission.

WORKMEN'S COMPENSATION INSURANCE STATE PREMIUM TAX AND EXPENSE LOADING  
(Corrected to January 1, 1926)—Continued

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ACTUARIAL AND STATISTICAL NOTES

State	"State" Premium Tax					Total Expense Loading		Expense Multipliers	
	State %	Retal-iatory	City %	Misc. %	Total %	Industrial %	Coal Mine %	Industrial	Coal Mine
Maine.....	1.5	yes	..	..	2.	40.	34.	1.667	1.515
Maryland.....	1.	no	..	3. (a)	4.	42.	36.	1.724	1.563
Massachusetts.....	2.	yes	..	..	2.	40.	34.	1.667	1.515
Michigan.....	2.	yes	..	..	2.	40.	34.	1.667	1.515
Minnesota.....	2.	no	..	..	2.	40.	34.	1.667	1.515
Missouri.....	2.	yes	..	..	2.	40.	34.	1.667	1.515
Montana.....	2.	yes	..	..	2.	40.	34.	1.667	1.515
Nebraska.....	2.	no	..	..	2.	40.	34.	1.667	1.515
New Hampshire.....	2.	yes	..	..	2.	40.	34.	1.667	1.515
New Jersey.....	2.	yes	..	.75 (b)	2.75	40.75	34.75	1.688	1.533
New Mexico.....	2.	yes	..	..	2.	40.	34.	1.667	1.515
New York.....	1.	yes	..	1.8	3.8	40. (c)	34.	1.667	1.515
Oklahoma.....	2.	no	..	..	2.	40.	34.	1.667	1.515
Rhode Island.....	2.	yes	..	..	2.	40.	34.	1.667	1.515
South Dakota.....	2.5	yes	..	..	2.5	40.5	34.5	1.681	1.527
Tennessee.....	4.	no	..	..	4.	42.	36.	1.724	1.563
Texas.....	2.6	no	..	..	2.6	40.6	34.6	1.684	1.529
Utah.....	1.5	yes	..	..	2.	40.	34.	1.667	1.515
Vermont.....	2.	yes	..	..	2.	40.	34.	1.667	1.515
Virginia.....	3.5	yes	..	..	3.5	41.5	35.5	1.709	1.550
Wisconsin.....	2.	no	..	..	2.	varies by kind of company			

Notes: (a) For expenses of the Industrial Commission.

(b) Includes .5% towards special fund for "second injury" cases and .25% for expenses of Banking and Insurance Commission.

(c) Loading of 41.8% disapproved by Insurance Commissioner, 40% being approved instead.



COMPARISON OF COMPENSATION EXPENSE LOADINGS

Present		
Kind of Expense	Industrial %	Coal Mine %
Inspection & Acc. Prevention	2.5	4.0
Claim.....	8.0	8.0
Payroll Audits.....	2.0	2.0
Total Service Items.....	12.5	14.0
Home Office.....	7.5	7.5
Taxes*.....	2.5	2.5
Acquisition.....	17.5	10.0
Total other expenses and taxes.....	27.5	20.0
Total Loading.....	40.0	34.0
1920 Revision		
Inspection.....	2.0	4.0
Claim.....	7.0	7.0
Home Office.....	8.0	8.0
Taxes*.....	3.5	3.5
Acquisition.....	17.5	10.0
Total Loading.....	38.0	32.5

\*Note: Normal State Premium Tax of 2% assumed.

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## OBITUARY

### THEODORE E. GATY

Born, March 9, 1861

Died, August 22, 1925

With the passing of Theodore E. Gaty a notable figure was lost to the world of casualty insurance. A graduate of Washington University of St. Louis, and a mining and mechanical engineer, his earlier years were spent in the direction and management of important industries where his training and natural ability, which was of a high order, made him valuable; and enabled him to develop and broaden, by practical experience, his knowledge of, and acquaintance with, business operations in general.

In the infancy of liability insurance, in the year 1894, Mr. Gaty became associated with the Union Casualty Company of St. Louis and in the brief period of six years, rose from Inspector of Liability Risks to Vice President and General Manager. He joined forces with the Fidelity and Casualty Company of New York on January 1, 1900 as Superintendent of the Liability Department and brought to that office a knowledge of the casualty business which made him a valuable asset to the company. Not only did he possess this knowledge but his well trained mind was coupled with good judgment and insight. His decisions were made promptly and decisively. He was a student to the end of his days. He made a specially close and careful study of workmen's compensation insurance. His reasoning was sound and convincing and he became a recognized authority in all questions affecting the various lines of casualty insurance.

Mr. Gaty, like all strong men, was positive and decided. No one could possibly doubt where he stood on any question submitted to him. Withal, he was a kindly man always ready to advise those who sought his help. Courageous and uncomplaining, in the face of physical ailments which would wring the soul of any of us, he never failed to preserve a cheerful manner and a brave spirit.

We miss him very much. His fund of anecdote, his superior mind, his genial way with his friends, and his all round lovable qualities, endeared him to all of his associates, and especially to those of us who were privileged to be close to him and to enjoy his full confidence.

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## CASUALTY ACTUARIAL SOCIETY

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### THE COUNCIL

<i>*Officers:</i>	G. F. MICHELBACHER.....	<i>President</i>
	SANFORD B. PERKINS.....	<i>Vice-President</i>
	RALPH H. BLANCHARD.....	<i>Vice-President</i>
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	ROBERT J. McMANUS.....	<i>Editor</i>
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	FRANK R. MULLANEY.....	1927
	JAMES S. ELSTON.....	1927
	EDWIN W. KOPF.....	1928
	JOSEPH H. WOODWARD.....	1928
	GEORGE D. MOORE.....	1928

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*\*Terms expire at the annual meeting in November, 1926.*

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



ABSTRACT FROM THE MINUTES OF THE TWELFTH  
ANNUAL MEETING, NOVEMBER 18, 1925

The twelfth annual (twenty-fifth regular) meeting of the Casualty Actuarial Society was held at the Hotel Belmont, New York, on Wednesday, November 18, 1925.

President Michelbacher called the meeting to order at 10.15 A. M. The roll was called showing the following thirty-five Fellows and twenty Associates present:

FELLOWS

BLANCHARD	KOPF	PERKINS
BUDLONG	LAWRENCE	PINNEY
CRAIG	LESLIE	ROEBER
DEUTSCHBERGER	LEAL	RUBINOW
DORWEILER	LITTLE	RYAN
DUNLAP	MCMANUS	SCHEITLIN
ELSTON	MAYCRINCK	SENIOR
FONDILLER	MELTZER	TARBELL
GINSBURGH	MICHELbacher	VAN TUYL
GLOVER	MOORE, G. D.	WHITNEY
HATCH	MULLANEY	WOODWARD
JACKSON, C. W.	OUTWATER	

ASSOCIATES

AULT	HAUGH	SIBLEY
BLACK, N. C.	HULL	SMITH, A. G.
CONSTABLE	MATTHEWS	SPENCER
COMSTOCK	PIKE	STOKE
FLEMING	RICHTER	THOMPSON, A. E.
GRAHAM, C. M.	ROBBINS	WILKINSON
HALL, L. L.	SAWYER	

President Michelbacher read his presidential address.

The minutes of the meeting held June 5, 1925, were approved as printed in the *Proceedings*.

The Secretary-Treasurer read the report of the Council and upon motion, it was adopted by the Society. J. H. Washburn had been enrolled as an Associate without examination. Diplomas had been sent to W. M. Corcoran and L. A. H. Warren who had been admitted as Fellows under the 1925 examinations. The new Syllabus and the

new Recommendations for Study, both submitted by the Educational Committee, were approved for printing as the Fourth Edition. Examination rules Nos. 4, 5 and 6 appearing in the 1925 Year Book, had been amended as shown in the 1926 Year Book. The memorial notice of Theodore E. Gaty appearing in this Number was read.

The Council reported that the following Associates had passed the necessary examinations and had been enrolled as Fellows:

W. M. CORCORAN

L. A. H. WARREN

The Council also reported that the following candidates had passed the necessary examinations and had been enrolled as Associates:

W. H. BITTEL

E. H. NICHOLSON

H. C. CRANE

M. R. PRENNER

M. E. DAVIS

A. Z. SKELDING

C. H. FREDRICKSON

A. SOMMER

W. D. HALL

S. H. TAO

S. K. LI

A. C. WELLMAN

J. MALMUTH

J. M. WOOLERY

The reports of the Secretary-Treasurer (Richard Fondiller) and of the Librarian (Edward R. Hardy) were read and accepted. The annual report of finances follows:

### ANNUAL REPORT OF FINANCES

FOR THE YEAR ENDING OCTOBER 31, 1925

#### Assets November 1, 1924:

Cash.....	\$ 861.87	
\$1,000 Liberty Loan Bonds $4\frac{1}{4}\%$ at cost.	1,000.00	\$1,861.87
Loss—Disbursements over income, year ending October 31, 1925.....	568.38	

#### Assets October 31, 1925.

Cash.....	293.49	
\$1,000 Liberty Loan Bonds $4\frac{1}{4}\%$ at cost.	1,000.00	\$1,293.49

#### INCOME

Members' Dues.....	\$1,950.00	
Sales of Proceedings.....	1,035.82	
Sales of Index.....	563.90	
Examination Fees.....	305.00	
Luncheons.....	133.00	
10th Anniversary Dinner.....	144.00	
Reprints of two papers.....	41.00	\$4,172.72

DISBURSEMENTS

Printing and Stationery.....	\$3,182. 83	
Postage, telegrams and express.....	133. 62	
Secretarial Work.....	360. 00	
Luncheons.....	203. 90	
10th Anniversary Dinner and Entertainment..	447. 00	
Editorial Work.....	68. 50	
Examination Expense.....	236. 34	
Books for Hartford Library.....	29. 25	
Books for New York Library.....	38. 59	
Miscellaneous.....	41. 07	\$4,741. 10
Loss for the year as above.....		\$ 568.38

The Auditing Committee (Charles E. Heath, Chairman) reported that the books of the Secretary-Treasurer had been audited and his accounts verified.

The Educational Committee (Edwin W. Kopf, Chairman) reported upon the new Syllabus, the new Recommendations for Study, and the text books for students which are in preparation.

The Secretary-Treasurer announced that the Council had elected Robert J. McManus as Editor and William Breiby as Librarian, subject to confirmation by the Society. The annual elections were then held and the following officers and members of the Council were declared elected:

- President..... G. F. MICHELbacher
- Vice-President..... SANFORD B. PERKINS
- Vice-President..... RALPH H. BLANCHARD
- Secretary-Treasurer..... RICHARD FONDILLER
- Editor..... ROBERT J. McMANUS
- Librarian..... WILLIAM BREIBY

Members of Council (terms expire 1928)

EDWIN W. KOPF    JOSEPH H. WOODWARD    GEORGE D. MOORE

A vote of thanks was tendered by the Society to the retiring officers and members of committees.

Recess was taken until 2 P. M.

By invitation of the Committee on Program, Dr. Roy B. Kester, Professor of Accounting, Columbia University, spoke on "The Interrelations between Management and Accounting" and Mr. Buckner Speed of the Bell Telephone Laboratories presented "Note on the Normal Probability Curve."

The papers printed in this Number were read or presented.

Upon motion the meeting adjourned at 5 P. M.

## SYLLABUS OF EXAMINATIONS

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SUBJECTS

ASSOCIATESHIP: (*Part I: Sections 1 to 4; Part II: Sections 5 to 8*)

- Section 1. Advanced algebra*
- Section 2. Compound interest and annuities certain*
- Section 3. Descriptive and analytical statistics*
- Section 4. Elements of accounting, including double-entry bookkeeping*
- Section 5. Finite differences*
- Section 6. Differential and integral calculus*
- Section 7. Probabilities*
- Section 8. Elements of the theory of life contingencies; life annuities; life assurances*

FELLOWSHIP: (*Part I: Sections 9 to 12; Part II: Sections 13 to 16*)

- Section 9. Policy forms and underwriting practice in casualty insurance*
- Section 10. Investments of insurance companies*
- Section 11. Insurance law and legislation*
- Section 12. Economics of insurance*
- Section 13. Calculation of premiums and reserves for casualty (including social) insurance*
- Section 14. Advanced practical problems in casualty (including social) insurance statistics*
- Section 15. Advanced problems and practical methods of casualty insurance accounting*
- Section 16. Advanced problems in underwriting, administrative and service elements of casualty (including social) insurance*



RULES REGARDING EXAMINATIONS FOR  
ADMISSION TO THE SOCIETY  
(As Amended November 17, 1925)

The Council adopted the following rules providing for the examination system of the Society:

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

2. Application for admission to examination should be made on the Society's blank form, which may be obtained from the Secretary-Treasurer. No applications will be considered unless received before the first day of March preceding the dates of examination.

3. A fee of \$5.00 will be charged for admission to examination. This fee is the same whether the candidate sits for one or two parts and is payable for each year in which the candidate presents himself. Examination fees are payable to the Secretary-Treasurer and must be in his hands before the first day of March preceding the dates of examination.

4. The examination for Associateship consists of two parts. No candidate will be permitted to present himself for Part II unless he has previously passed in Part I or takes Parts I and II in the same year. If a candidate takes both parts in the same year and passes in one and fails in the other, he will be given credit for the part passed. Upon the candidate having passed both Parts I and II he will be enrolled as an Associate, provided he presents evidence of at least one year experience in actuarial, accounting or statistical work in casualty insurance offices or in the teaching of casualty insurance science at a recognized college or university, or other evidence of his knowledge of the actuarial, accounting and statistical work of casualty insurance offices as is satisfactory to the Council.

5. In the case of applicants in the following classes, the Council may, upon receipt of satisfactory evidence that applicants are within the terms of this rule, waive the passing of both Parts I and II of the Associateship Examination. Such applicants may become Associates upon passing Part I of the

Fellowship Examination, and may be admitted as Fellows by examination, provided they subsequently pass Part II of the Fellowship Examination.

- (a) Casualty insurance men not less than thirty years of age who have been in the business a number of years and who have attained responsible actuarial, statistical, accounting or semi-executive positions.\*
- (b) Fellows and Associates by examination of the Actuarial Society of America or of the American Institute of Actuaries.

6. The examination for Fellowship is divided into two parts. No candidate will be permitted to present himself for Part II unless he has previously passed in Part I or takes Parts I and II in the same year. If a candidate takes both parts in the same year and passes in one and fails in the other, he will be given credit for the part passed.

7. As an alternative to the passing of Part II of the Fellowship examination, a candidate may elect to present an original thesis on an approved subject relating to casualty or social insurance. Candidates electing this alternative should communicate with the Secretary-Treasurer as to the approval of the subject chosen. All theses must be in the hands of the Secretary-Treasurer before the first Thursday 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*.

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\*In support of the candidate's claim that he is within the terms of this rule, he should attach to his application a letter from each of the nominators signing his application. These letters should state the facts of the candidate's experience which appear to entitle the candidate to the benefit of this rule.

## RECOMMENDATIONS FOR STUDY\*

NOTE: The number in parentheses after the title refers to the more complete description of the book in the *Index* at the end of these *Recommendations*. The text volumes which should be studied closely are denoted thus: (†).

ASSOCIATESHIP (Sections 1 to 8)

(PART I, SECTIONS 1 to 4; PART II, SECTIONS 5 to 8)

SECTIONS 1 to 4 comprise the first Part of Associateship subjects and SECTIONS 5 to 8 the second Part.

### *Section 1. Advanced algebra.*

This subject includes the matter in the ordinary college algebra, except determinants, continued fractions, and the theory and solution of equations higher than the quadratic. Special emphasis should be placed upon permutations and combinations. Preparation in elementary and intermediate high school algebra and in practical business arithmetic is presupposed.

#### *Texts:*

(†) *Wells, W.* College algebra. (72). Chapters XX to XXXIV, and Chapters XXXVI, XXXIX; (†) *Hall and Knight.* Higher algebra. (30). First 16 chapters, except Chapters VI, VII and XV; *Rietz, H. L. and A. R. Crathorne.* College algebra. (59); *Skinner, E. B.* Mathematical theory of investment. (65). Chapters I to IV. (A brief review of some phases of algebra that will be especially useful in studying later sections of the syllabus.)

### *Section 2. Compound interest and annuities certain.*

#### *Texts:*

(†) *Skinner, E. B.* Mathematical theory of investment (65). Chapters V to X of 1924 edition, or Chapters V to VIII of 1913 edition; (†) *Rietz, Crathorne and Rietz.* Mathematics of finance (58). Chapters I to IV; *Hart, W. L.* Mathematics of investment (33). (Facility with problems in the mathematics of finance will be obtained by working as many as possible of the 100 exercises given at the close of Part I of this text by Professor Hart); *Mackenzie, M. A.* Interest and bond values (45).

NOTE ON SECTION 2: Any one of the above texts should be mastered as the main text and the others used to clear up points not readily understood. The principal advantage in using the series of texts is the variety of problems, the solution of which is valuable in clarifying the subject.

\*Fourth Edition.

*Section 3. Descriptive and analytical statistics.*

This subject covers the commonly accepted elementary and intermediate methods of statistical description and analysis, but excludes advanced mathematical methods applicable only to special problems.

- (†) *Chaddock, R. E.* Principles and methods of statistics. (8); *Crum, W. L. and A. C. Patton.* Economic statistics. (15); *Mills, F. C.* Statistical methods applied to economics and business. (50); (†) *Karsten, K.* Charts and graphs. (42). (†) *Yule, G. Udny.* Introduction to the theory of statistics. (76) is an excellent text for intermediate study leading to the more advanced methods.

*Section 4. Elements of accounting, including double-entry bookkeeping.*

The student should have an understanding of the basic principles of double-entry bookkeeping and their application to the following: theory of debit and credit and its application to the presentation of simple accounting facts; the uses and relations of the basic accounting books,—ledger, journal, cash-book and voucher register, with simple columnar development; the technique of periodic adjustments affecting accruals, use of subsidiary ledgers and of controlling accounts; meaning and relation of the balance sheet, loss and gain account and the technique of their preparation as applied to simple problems. The student will not be expected to be familiar in detail with the elements of accounting which apply chiefly to mercantile and manufacturing accounts (inventory, manufacturing and cost accounts, partnership, consignments, discounts, valuation of assets and good will and issuance of capital stock, and corporate organizations.)

*Texts:*

- (†) *Hull, R. S.* Casualty insurance accounting. Part I. (38) (In preparation.); (†) *Kester, R. B.* Accounting theory and practice. Volume I, Chapters I to XXX. (43); (†) *McKinsey, J. O.* Bookkeeping and accounting. (46); SUPPLEMENTARY READING. (†) *Hodge, A. C. and J. O. McKinsey.* Principles of accounting. (35).

*Section 5. Finite differences.**Texts:*

- (†) *Burn, J. and Brown, E. H.* Elements of finite differences. Chapters I to III, chapter V to Section 101. (Second edition, 1915). (7); (†) *Forsyth, C. H.* Introduction to the mathematical analysis of statistics. Chapters II and III, except Sections 20 and 21. (25); *Henry, Alfred.* Calculus and probability for actuarial students. (34). Chapters II to IX; (†) *Institute of Actuaries, Great Britain.* Textbook, Volume II, Second Edition, Chapters XXII to XXIV, Section 20, may be read as alternate to *Burn and Brown.* (39).

*Section 6. Differential and integral calculus.**Texts:*

- (†) *Granville, W. A. and P. F. Smith.* Elements of the differential and integral calculus. (28). (For students who have not previously studied any other text). Sections 1 to 60, 75 to 77, 87 to 110, 116 to 127, 147 to 159, 181 to 183, 185 to 197, 204, 208 to 216, 219 to 221. All theory and problems involving trigonometry may be omitted; *Thompson, S. P.* Calculus made easy. (69). (This will serve as a review text.)

*Section 7. Probabilities.*

This subject covers the algebraic treatment of probabilities, with elementary concepts of the probability integral.

- Texts:* (†) *Hall and Knight.* Higher algebra. (30). Chapter XXXII (except geometrical methods).

The following selected readings are also recommended.

- (†) *Pearl, R.* Medical biometry and statistics. Chapter XI. (53); *Skinner, E. B.* Mathematical theory of investment. Chapter XV in 1924 edition or Chapter XI in 1913 edition. (65); (†) *Henry, Alfred.* Calculus and probability for actuarial students. Chapter XXI. (34); *Forsyth, C. H.* An introduction to the mathematical analysis of statistics. Chapter V. (25); *Rietz, H. L. and A. R. Crathorne.* College algebra. (59). Chapters

on permutations, combinations and probabilities; *Rietz, Crathorne and Rietz*. Mathematics of finance. Chapter VII. (58); *Wells, W.* College algebra. Chapter XXXVII. (72); *Griffin, F. L.* An introduction to mathematical analysis. Chapter XIV. (29); *Mellor, J. W.* Higher mathematics for students of chemistry and physics. pp. 344-345. (48).

*Section 8. Elements of the theory of life contingencies; life annuities; life assurances.*

- (†) *Dowling, L. Wayland.* Mathematics of life insurance. (17). Chapters 1 to 6 and 9; *Moir, H.* Life assurance primer. Chapters I to VIII and Chapter X. (51); *Forsyth, C. H.* Mathematical theory of life insurance (Except sections 19 to 23). (26).

The following may be read as introductions to the preceding texts.

*Rietz, Crathorne and Rietz.* Mathematics of finance. Chapters VIII and IX. (58); *Skinner, E. B.* Mathematical theory of investment. Chapter XII. (65).

NOTE ON SECTION 8: The student is urged to pay particular attention to the subject of life annuities.

## FELLOWSHIP (Sections 9 to 16)

(PART I, SECTIONS 9 TO 12; PART II, SECTIONS 13 TO 16)

SECTIONS 9 to 12 comprise the first Part of Fellowship subjects and SECTIONS 13 to 16 the second Part.

*Section 9. Policy forms and underwriting practice in casualty insurance.*

The student should be thoroughly familiar with the policy forms and rate manuals in use in the several divisions of casualty insurance. The analysis of the policy contract and the study of the descriptive matter and rate tables of the manuals will give the student a sound understanding of the various kinds of insurance. The following items require particular attention:

- A. *The Insuring Clauses of the Contract:* (a) subject matter of the insurance; (b) the contingency insured against; (c) service in investigations and settlements; (d) defense of suits; (e) payment of expenses; (f) exceptions as to coverage; (g) period of insurance; (h) conditions relieving insurer of liability.
  
- B. *The Premium:* (a) unit on which computed; (b) when payable; (c) methods of adjustment when policy is cancelled by insurer or assured.
  
- C. *General Provisions:* (a) inspection of premises or subject of the insurance by the insurer; (b) inspection of the assured's books; (c) notice of loss; (d) subrogation.

*Texts:*

- (†) *Blanchard, R. H.* Liability and compensation insurance. (4); (†) *Downey, E. H.* Workmen's compensation insurance. (18); *Dunham, H. P.* Business of insurance. (20) Chapter LXIII; *Hord, E. F.* History and organization of automobile insurance. Maryland Casualty Co., Baltimore, 1919; (†) *Insurance Society of New York*, Lectures on insurance; Junior, Intermediate and Senior Courses. (1921-1925.) Weekly Underwriter, 80 Maiden Lane N. Y. City, \$1.00 each; *Insurance Society of New York*. Lectures on automobile insurance. Published by the Society, New York, 1924.; *Insurance Library Association of Boston*. Lectures on casualty insurance. 1922. (40); *Lunt, E. C.* Surety bonds. (44).; (†) *Michelbacher, G. F. and Nial, T. M.* Workmen's compensation insurance. (49); (†) *Riegel R. and Loman, H. J.* Insurance principles and practices. (57). Chapters XI, XII, XX, XXI, XXII, XXIII; *Ryder, Ambrose.* Automobile insurance. (62); *Towner, R. H.* Premiums and rates (fidelity and surety). 1925. Also, Scientific basis of fidelity and surety rates, 1924. Towner Rating Bureau, New York.

*Readings in Periodical Literature:*

- Blanchard, R. H. and G. D. Moore.* Corporate bonding Proc. VII, 23; *Federal Reserve Board.* Federal Reserve Bulletin, Final edition. Credit insurance. June, 1922. Page 667. Washington, D. C.; *Fitch, F. M.* Some distinctive features of steam boiler underwriting and their bearing upon the formulation of premium rates. Proc. II, 407; *Garrison, F. S.* Plate glass insurance. Proc. XI, p. 200; *Hobbs, C. W.* Insurance coverages as affected by the charter powers of insurance companies (a paper before the National Convention of Insurance Commissioners, August 1, 1923); *Laird, J. M.* Non-cancellable accident and health insurance underwriting problems. Proc. VII, 302; *Michelbacher, G. F.* Manufac-



turers' and contractors' public liability insurance. PROC. IV, 89 and Casualty insurance for automobile owners. PROC. V, 213; *Michelbacher, G. F. and L. H. Carr.* Burglary, theft and robbery insurance. PROC. XI, 33; *Pinney, S. D.* Miscellaneous property damage insurance. PROC. X, 33; *Stellwagen, H. P.* Automobile rate making. PROC. XI, 276.

*Section 10. Investments of insurance companies, with special emphasis upon the investment principles and practice of casualty and allied lines of insurance.*

Preparation in introductory economics and in the principles of investment banking is presupposed. References are given, however, in the prerequisite subjects for the guidance of students through this preparatory work.

*Introductory economics.*

- (†) *Taussig, F. W.* Principles of economics. (68); or *Ely, Richard T.* Outlines of economics. (22).

*Investments.*

- (†) *Zartman, L. F.* Investments of life insurance companies. (77); *Chamberlain, L.* Principles of bond investment. (9); *Conant, C. A.* Principles of money and banking. (13); *Dewey, D. R., and Shugrue, M.* Banking and credit. (16); *Jordan, D. F.* Investments. (41); *Withers, Hartley.* The meaning of money. (74); *Dunbar, C. F.* Theory and history of banking. (19); *Rose, D. H.* Investments of insurance companies with special reference to modern developments. *Transactions, International Congress of Actuaries.* Vol. I, p. 403.

The student will be expected to show familiarity with current investment practices of casualty companies, including the law governing such investments.

*Section 11. Insurance law and legislation*, including supervision, regulation and taxation of casualty and allied branches of insurance and the more important statutes of the United States (and Canada, for Canadian candidates) relating to casualty insurance.

*A. Introduction to the law; commercial law.*

This subject covers the instruction usually given in undergraduate courses on business or commercial law. The student will be expected to have an understanding of the basic principles of the law.

(†) *Clayton, Byron*. Introduction to the law for insurance students. Vol. I of the texts on insurance law being prepared for the Society under supervision of Mr. William Brosmith. (10); (†) *Bacon, C. F.* Readings in contracts (principles and cases); agency and sales; negotiable instruments; bankruptcy. (1); *Stone, H. F.* Law and its administration. (67); *Pound, Roscoe*. Jurisprudence. (55).

*B. General Insurance Law.*

*Vance, W. R.* Handbook of the law of insurance (70), or *Richards, G.* Treatise on the law of insurance. Also *Richards'*, Cases on the law in insurance. (56).

*C. Casualty Insurance Law.*

*Brosmith, William and associates*. Casualty insurance law. Vols. II *et seq.* (6). (In preparation).

*D. Accident and Employers' Liability Insurance Law.*

*Fuller, H. B.* Law of accident and employers' liability insurance. (27).

*E. Current Decisions.*

See Legal Notes in the *Proceedings* of the *Casualty Actuarial Society* also in the *Transactions* of the *Actuarial Society of America*. It is hardly necessary to go back more than three years in examining these notes. See also the *Insurance Law Journal*, published by The Insurance Law Journal Co., 27 Cedar Street, New York City.

*F. Workmen's Compensation Insurance Law.*

*Bradbury, H. B.* Workmen's compensation and state insurance law. (5); or *Bradbury's Workmen's*

compensation law, 3rd edition, 1917, 5(a); or *Honnold, A. B.* Treatise on the American and English workmen's compensation laws. (36); *Workmen's Compensation Publicity Bureau*, 80 Maiden Lane, N. Y. City. Digest of Workmen's Compensation Laws, 9th edition, 1925.

*G. Current Decisions on Workmen's Compensation.*

Reported decisions of administrative commissions, particularly those of Massachusetts, New York, Connecticut and California. These decisions are generally reported in some official publication, such as the *Bulletin* of the New York State Industrial Commission or the *Monthly Review* of the United States Bureau of Labor Statistics.

*H. Statute Law Governing Insurance Companies.*

The student can generally obtain from the insurance departments of the several states, a pamphlet reprint of the insurance law, and he should be familiar with the laws relating to casualty companies. In some states, as in New York for example, the law cannot be obtained in this way but must be found in a publication such as: *Baldwin, W. E.* New York insurance law (annotated) (2). *Cooley, R. W.* Briefs on the law of insurance. (14); *Hobbs, C. W.* State regulation of insurance rates, Proc. XI, 218.

*Section 12. Economics of insurance.*

This subject includes the theory of risk, and the theory and practice of social insurance.

Preparation in introductory economics is pre-supposed. See Section 10, Fellowship syllabus, "Investments of insurance companies."

*Texts:*

- (†) *Willett, A. H.* Economic theory of risk and insurance. Chapters 1 and 7. (73); *Hardy, C. O.* Risk and risk-bearing. (32); *Fisher, Irving.* Nature of capital and income. Chapter XVI. (24); (†) *Zartman, L. and W. H. Price.* Yale Readings in Insurance—Personal insurance. Chapters I, II, III, IV. (78); *Huebner, S. S.* Property insurance. (37). Chapter I. Although concerned with fire insurance, the ideas in this chapter are applicable to other forms

of insurance; *Seager, H. R.* Social insurance. (64); *Rubinow, I. M.* Social insurance. (60). Standards of health insurance. (61); *Cohen, J. L.* Social insurance unified and other essays (including mothers' pensions). (11). Insurance against unemployment. (12); *Beveridge, W. H.* Unemployment. (3); *Craig, J. D.* Unemployment insurance. *Transactions of the Actuarial Society of America* V. 24, pt. 1, 1923, p. 168; *Halsey, O. S.* Unemployment insurance. (31); *International Labour Office, League of Nations, Geneva.* Sickness insurance, (Series M, No. 4). Unemployment insurance. (Series C, No. 10). General problems of Social insurance, (Series M. No. 1). Compensation for industrial diseases, (Series M. No. 3); Compensation for industrial diseases, (Series M, No. 2). Workmen's compensation legislation in the United States (Prepared by R. H. Blanchard).

The student having access to a good general library should consult H. W. Wilson Company's "*Index to Periodical Literature*" and the "*Public Affairs Information Service*" Bulletin for articles on social insurance and allied topics. The publications of the *American Economic Association*, the *Association for Labor Legislation* and the *United States Bureau of Labor Statistics* should be consulted also.

*Section 13. Calculation of premiums and reserves, including basis for reserves, for accident, sickness, workmen's compensation, pensions, unemployment and other branches of casualty (and social) insurance.*

(a) *Workmen's Compensation Manual Rates.*

*Blanchard, R. H.* Liability and compensation insurance. (4). Chapters XVII, XVIII and XXI; *Downey, E. H.* Classification of industries for workmen's compensation insurance. PROC. II, 10; Uses and abuses of Schedule Z. PROC. X, 67; *Greene, W. W.* Compensation rate making problem in the light of the 1923-1924 Revision. PROC. X, 163; *Hobbs, C. W.* Permanent ratemaking method adopted by the National Council on Compensation Insurance; *Mowbray, A. H.* How extensive a payroll

is necessary to give a dependable pure premium? PROC. I, 24; Actuarial problems of the 1920 national revision of workmen's compensation insurance rates. PROC. VI, 250; Classification of risks as the basis of insurance rate making. PROC. VIII, 77; Procedure for making rates for workmen's compensation insurance. PROC. IX, 186; Legal limits of weekly compensation in their bearing on ratemaking. PROC. IX, 208; *Michelbacher, G. F.* Theory of law differentials. PROC. III, 195; Technique of ratemaking as illustrated by the 1920 national revision of workmen's compensation insurance rates. PROC. VI, 201; *Michelbacher, G. F.* and *Nial, T. M.* Workmen's compensation insurance. (49); *Perkins, S. B.* Some observations on the development of manual rates for workmen's compensation insurance. PROC. IX, 269; A suggested system of standard notation for actuarial work in workmen's compensation insurance. PROC. VII, 36; *Rubinow, I. M.* Scientific methods of computing compensation rates. PROC. I, 10; *Ryan, H. E.* Revision of workmen's compensation rates. PROC. III, 175; *Wilson, W. N.* Permanent total disability from accidental causes. PROC. IX, 65; *Woodward, J. H.* Fraternal Sicknes Insurance, *Proceedings of the Fraternal Actuarial Association*, No. 6, 1923.

(b) *Merit Rating.*

*Various:* Schedule rating in compensation insurance. PROC. I, No. 3. (This whole meeting was devoted to a discussion of schedule rating).

*Blanchard, R. H.* Liability and compensation insurance. (4). Chapters XIX and XX; *Downey, E. H.* Preliminary test of the coal mine rating schedule of the associated companies. PROC. II, 387; Some principles of compensation merit rating. PROC. III, 26; The industrial compensation rating schedule, 1918. PROC. IV, 325; *Hobbs, C. W.* Experience rating in compensation insurance. (A paper read at the 55th Session of the National

Convention of Insurance Commissioners, August 1, 1924); *Michelbacher, G. F.* Practice of experience rating. PROC. IV, 293; *Mowbray, A. H.* Scheduled experience rating. PROC. III, 14; *Perkins, S. B. and R. A. Wheeler.* 1922 revision of the industrial compensation rating schedule. PROC. IX, 11; *Senior, Leon S.* Experience rating, *in rem* and *in personam*. PROC. XI, 211; *Whitney, A. W.* Theory of experience rating. PROC. IV, 274; Study of schedule rating. PROC. VII, 225; *Woodward, J. H.* Experience rating of workmen's compensation risks. PROC. II, 356.

(c) *Loss Reserves for Workmen's Compensation.*

*Various:* Compensation and liability claim reserves. PROC. I, No. 2. (An entire meeting was devoted to this topic. The several papers should be carefully read); *Blanchard, R. H.* Liability and compensation insurance (4). Chapter XXI; *Fondiller, R.* Tables for computing present value of death benefits. PROC. II, 110; *Woodward, J. H.* Premiums and reserves of the Swiss Accident Insurance Institution. PROC. IV, 45; Valuation of benefits to widows and children provided by New York workmen's compensation law as amended in 1922. *Transactions of the Actuarial Society of America.* XXIV, 414; *Penman, W., Jr.* On the valuation of the liabilities of an insurance company under its employers' liability contracts. JOURNAL of the *Institute of Actuaries.* XLV, 101.

(d) *For Premiums on Other Casualty Lines.*

*Cammack, E. E.* Premiums and reserves for non-cancellable accident and health insurance. PROC. VII, 267; *Elderton, W. P. and R. C. Fippard.* Construction of mortality and sickness tables. (21); *Fallow, E. S.* Accident statistics and reserves. Accident and Health Insurance Lectures. Insurance Institute of Hartford. (23); *Hardy, G. F.* Friendly Societies. JOURNAL of the *Institute of Actuaries.* XXVII, 245; *Kirkpatrick, A. L.* Development of public liability insurance rates for

automobiles. PROC. VIII, 35; *Laird, J. M.* Non-cancellable accident and health insurance underwriting problems. PROC. VII, 302; *Parks, F. R.* Accident and health experience. (52); *Spurgeon, E. F.* Life contingencies. (66). Chapters I to IV, VII, IX, XI, XII, XIII, XV; *Watson, A. W.* Friendly society finance considered in its actuarial aspects. (71); Some points of interest in the operations of friendly societies. JOURNAL of the *Institute of Actuaries*. XLIV, 168; *Woodward, J. H.* Industrial retirement systems based on the money-purchase principle. PROC. VIII, 13; *Craig, J. D.* Health insurance from a theoretical and practical aspect. *Transactions of the Actuarial Society of America*. XV, 271; *King, W. I.* Accident and health insurance from an actuarial viewpoint. PROC. II, 49. NOTE: The student having access to a file of the *Journal* of the Institute of Actuaries of Great Britain should consult the index for recent years for articles on unemployment, health and other social insurance statistical and rate making practices.

(e) *Pensions.**Foundation for pension formulae*

*Manly, H. W.* On staff pension funds. JOURNAL of the *Institute of Actuaries*, XLV, 149; *King, G.* On staff pension funds. JOURNAL of the *Institute of Actuaries*, XXXIX, 129; *M'Lauchlan, J. J.* Fundamental principles of pension funds. TRANSACTIONS, *Faculty of Actuaries of Scotland*, IV, 195.

*Special pension funds*

*Buck, George B.* Valuation of pension funds, PROC. II, 370; *Commission on Pensions, City of New York.* Reports. Parts I, II and III. (Part I, pp. 1-83; part II, pp. 13-31, 41-65, 307-365; part III, pp. 1-23; Appendix, pp. 45-54); Report on the Police Pension Fund of the City of New York, 1913, pp. 149-212; Third annual report of Teachers' Retirement Fund of the City of New York. pp. 18-55; *Meriam, Lewis.* Principles governing retirement of public employees. (47); *Rietz, H. L.* Articles on pension

funds. *Record of the American Institute of Actuaries*. III, 33; VIII, 1; X, 1.

*Operation of establishment pension plans*

*British Board of Trade*. Report of the Committee . . . to inquire into the constitution, rules, administration and financial position of the superannuation and similar funds of railway companies. (Cd 5349-Wyman and Sons, 1910, London); *King Edward's Hospital Funds for London*. Report of the Executive Committee on pensions for Hospital Officers and Staffs. C. & E. Layton, London, 1919. (Spectator Co., N. Y. City).

*Section 14. Advanced problems in casualty (including social insurance statistics.*

This subject includes (A) *the planning and use of statistical manuals and systems*, for the compilation and presentation of casualty insurance statistics, for rate-making and administrative purposes; (B) *the chief characteristics, sources and uses of external statistics* auxiliary to rate-making and administrative procedures in casualty (and social) insurance.

(A) *Internal Statistics of the Casualty and Allied Lines.*

The study of statistical plans in use in connection with casualty and related lines is essential. The "Workmen's Compensation Statistical Plan" may be obtained from the *National Council on Compensation Insurance*, 151 Fifth Avenue, New York City. Plans for several other lines are published by the *National Bureau of Casualty and Surety Underwriters*, 120 West 42nd Street, New York City.

*Bureau of Personal Accident and Health Underwriters*  
(80 Maiden Lane, New York City).

- (1) Non-cancellable accident and health statistical plan.
- (2) Personal accident and health statistical plan. (Accident section).
- (3) Personal accident and health statistical plan. (Health section.)
- (4) Classification of occupations for accident and health experience.
- (5) Combined health experience on commercial policies. Policy year 1921. (\$5.00 for non-member companies or for additional copy to member companies.)



*Cammack, E.* System of analyzing workmen's compensation business by means of perforated cards. PROC. II, 90; *Downey, E. H.* Remarriage experience of Pennsylvania compensation insurance carriers. Policy years 1916-1919. PROC. VIII, 201; Uses and abuses of Schedule Z. PROC. X, 67; *Maddrill, J. D.* Compensation cost of occupational disease. PROC. II, 208; *Moore, W. F.* Plate glass statistical classification codes and information. (80 Maiden Lane, New York City); *National Bureau of Casualty and Surety Underwriters.* Burglary insurance statistical plan. (120 West 42nd Street, New York City); *Outwater, O. E.* An American accident table. PROC. VII, 57; *Pinney, S. D.* Review of statistical problems of casualty companies. PROC. X, 136.

(B) *External statistics—characteristics, methods and sources of value in rate-making and administrative procedure in casualty (and social) insurance.*

*Persons, W. M. (and others).* The problem of business forecasting. (54); *Whitney, A. W. and O. E. Outwater.* The past and future of workmen's compensation rate-making. PROC. X, 148; *Mowbray, A. H. and Vooght, W. G.* Industrial accident rates in the business cycle, PROC. XII; *United States Bureau of Labor Statistics.* Monthly Labor Review. (This *Bulletin* contains current articles and digests of statistical investigations into social, economic and insurance problems); Methods of Procuring and Computing Statistical Information of the Bureau of Labor Statistics. *Bulletin* No. 326. Bulletin Series of the United States Bureau of Labor Statistics. (Prices and the cost of living; wages and hours of labor; employment and unemployment; workmen's compensation and laws relating thereto; industrial accidents, diseases and injuries; conciliation and arbitration; labor laws; safety codes. A list of such publications may be secured upon application to the Commissioner of Labor Statistics, Department of Labor, Washington, D. C.); *Schmecke-*

bier, L. F. Statistical work of the United States Government. (63); *Federal Reserve Board*, Washington, D. C. Federal Reserve Bulletin. (Contains current statistics of interest and value to insurance statisticians.); *District Federal Reserve Banks*. Monthly bulletins. (The bulletins of the Federal Reserve Banks in New York, Boston and Philadelphia may be had upon application to the Federal Reserve Agent in each district).

*Cleveland Trust Company*, Cleveland, O. Monthly bulletin. (This contains current economic and business statistics, with analysis. Monthly reports of other banks of interest to insurance statisticians are issued by: National City Bank, N. Y. City; Chase National Bank, N. Y. City; First National Bank of St. Louis; National Bank of Commerce, N. Y. City; Royal Bank of Canada, Montreal, Canada); *Department of Commerce*, Washington, D. C. Survey of current business. (Contains an extensive collection of current data on insurance and business conditions); *American Statistical Association*, 474 W. 24th Street, N. Y. City, *Journal*; and *Royal Statistical Society*, London, England, *Journal*. These publications contain current articles on statistical methods and results which are helpful in insurance statistical work; *Harvard University, Committee on Economic Research. Review of Economic Statistics*. 1919 to date, Cambridge, Mass.; *State Publications on Labor Statistics*. The student should have access to the "Industrial Bulletin" of the New York (State) Industrial Commission (Albany); "Labor and Industry," Pennsylvania Dept. of Labor and Industry (Harrisburg); "Wisconsin Labor Market," Wisconsin Industrial Commission (Madison). *National Bureau of Economic Research*, 474 W. 24th Street, N. Y. City. Current bulletins and reports.

*Section 15. Advanced problems and practical methods of casualty insurance accounting*, including the preparation of schedules, exhibits and annual statements.

This subject includes the treatment of advanced practical problems of modern insurance operating accounts. The purpose and the technique of the preparation of the annual

statement, with accompanying schedules including schedule W and the New York Casualty Experience Exhibit, should be thoroughly understood.

*Text:*

Hull, R. S. Casualty insurance accounting, Part II. (38). (In preparation.)

*Readings:*

Craig, J. D. Allocation of expenses. PROC. X, 9; Hull, R. S. Allocation of administrative expense by lines for casualty insurance companies. PROC. IX, 38; Scattergood, Claude E. Cost accounting in casualty insurance. PROC. II, 253; Tarbell, Thomas F. Determination of acquisition and field supervision cost. PROC. X, 107; Van Tuyl, H. O. New experience exhibit for casualty insurance companies. PROC. X, 17; Wolfe, S. H. The examination of insurance companies. (75).

The accounting provisions of the liability and compensation loss reserve laws in force in New York, Massachusetts, Illinois and other States should be carefully examined. The student should endeavor to obtain from practical discussion and close observation, critical reading and original thinking, a facility for the solution of the accounting problems which come to the supervisory actuary of a casualty and miscellaneous line office.

*Section 16. Advanced problems in underwriting, administrative and service elements of casualty (including social) insurance.*

Technical proficiency in these subjects can be developed only by direct discussion with competent executives, underwriters, engineers and adjustors, and through extensive reading of the professional papers read before the several societies of supervisory and administrative officials. It is strongly recommended that students seek instruction through these means. Insurance periodicals, proceedings of conferences and conventions, technical papers in journals devoted to applied economics, featuring the insurance sciences, texts such as Dunham's "Business of Insurance" (20), afford sidelights on major problems of the casualty insurance business, its administration, and its relation to the public interest.

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## PROCEEDINGS

MAY 21, 1926

ON SOME INSURANCE PROBLEMS INCIDENTAL TO  
COMPULSORY AUTOMOBILE INSURANCE

PRESIDENTIAL ADDRESS, G. F. MICHELbacher

The present agitation for compulsory automobile insurance affords many excellent opportunities for acrimonious discussion; the subject is "full of dynamite." It might be considered wise under these circumstances to refrain from injecting the topic into the deliberations of a society such as this, where interests of every description are represented. I recognize this point of view and respect it for I feel that it is not our function to debate fundamental issues but rather to permit these questions to be decided elsewhere, and to limit our activity to the analysis and solution of technical problems which will arise once a definite policy has been formulated for our guidance.

This attitude may be taken in this particular case for the reason that there is a law actually on the statute books of one state and it is possible, therefore, to determine what problems such a law presents for consideration by the technicians of the business. Reference is made to the situation in the state of Massachusetts, where the so-called "Compulsory Automobile Liability Security Act," enacted in 1925, will become effective January 1, 1927, unless some unexpected legal process intervenes to render it inoperative. I intend to present a synopsis of the provisions of this law and, without attempting to say what the solution may be, to point out several problems confronting the insurance carriers which will operate under it.

## GENERAL PROVISIONS OF THE LAW\*

The purpose of the law is to make certain within reasonable limitations that those who, without fault on their part, suffer

\*Much of the material on this subject was obtained from a pamphlet published by the Employers' Liability Assurance Corporation of Boston, Massachusetts, entitled "Explanation, Text and Digest of the Massachusetts Compulsory Automobile Liability Security Act (1925, c. 346)."

because of bodily injuries resulting from the negligent operation of motor vehicles by others, will be able to collect damages from the negligent parties. It does not alter the existing legal relation of the parties at all; it merely requires each resident of Massachusetts who desires to operate a motor vehicle upon the highways of the state to demonstrate his ability to respond in damages if and when an injured person or his dependents obtain a judgment against him. Injured persons and their dependents, therefore, stand in exactly the same position as heretofore except that they are given assurance that, if their claims for damages are recoverable under the law, they will be able within certain limits to realize upon the judgments awarded to them by the courts;† hence the statement that this and similar legislation is designed to establish "financial responsibility for automobile accidents."

Motor vehicle owners with few exceptions—the state of Massachusetts, counties, cities or towns located in the state, corporations subject to the supervision of the Department of Public Utilities, and street railway companies under public control—are required to arrange for one of three forms of security before they can obtain licenses to operate their vehicles in the state:

(1) A "Motor Vehicle Liability Policy" may be purchased from any insurance carrier licensed by the insurance department to transact the business of automobile public liability insurance within the state. This is a policy corresponding in a general way to the usual automobile public liability policy with limits upon the liability of the carrier of \$5,000 on account of injury to or death of any one person, and subject to this limit as respects injury to or death of one person, of \$10,000 on account of any one accident resulting in injury to or death of more than one person (hereinafter referred to as limits of 5/10). The policy must contain certain provisions specified in the law and its form is subject to approval by the Insurance Commissioner. It must cover accidents caused not only by the owner of the motor vehicle, but also by any person responsible for its operation with the express or implied consent of the owner. It may not be cancelled by the policyholder unless the motor

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†This is true in general; however, it is obvious that the law cannot refer in any way to injuries inflicted by foreign, unidentified, stolen and unlicensed cars. Claimants who are unfortunate enough to sustain such injuries will be in no better position under the new law than they are at present.

vehicle which is covered has been transferred, lost, stolen or destroyed, or the policyholder has elected to substitute for it as security a deposit of money or securities. If cancellation by either policyholder or carrier is to be valid, proper notice must be filed with the Registrar of Motor Vehicles. The liability of the carrier may not be avoided by the death, insolvency or bankruptcy of the policyholder within the policy period; neither is the carrier's responsibility affected by statements made by the policyholder or in his behalf, or by violation by the policyholder of any of the terms of the policy. In short, every precaution is taken to safeguard the claimant's rights following the occurrence of an accident for which he is entitled to collect damages.

(2) A "Motor Vehicle Liability Bond" may be procured from any surety company licensed to transact business in the state. This is in the form of a guarantee that the owner's obligation (subject, as in the case of the motor vehicle liability policy, to limits of 5/10) will be fulfilled within thirty days after a judgment is rendered against him. If the owner should fail to pay within the specified period, the person entitled to the judgment may bring an action against the surety company in the name of the Commonwealth in whose favor the bond must be drawn. Here again the law enumerates certain provisions similar to those required for motor vehicle liability policies, and specifies that the form of the bond must be approved by the Insurance Commissioner.

(3) Five Thousand Dollars (\$5,000) in cash or securities may be deposited with the Division of Highways in the Department of Public Works.

In any case the owner of the motor vehicle will obtain a certificate indicating the method adopted by him for providing the security required by law. He must present this certificate with his application for registration to the Registrar of Motor Vehicles. It, therefore, becomes an important matter in the average case for the motor vehicle owner to be able to secure protection either in the form of an insurance policy or a bond, for it is obvious that few persons will elect to adopt the third alternative and deposit money or securities.

The law recognizes the seriousness of this situation by providing that the motor vehicle owner who is unable to secure a policy or a bond, or whose coverage has been cancelled, may have his case considered by a special tribunal called the "Board of Appeal on Motor Vehicle Liability Policies and Bonds," which is to be composed of the Insurance Commissioner or his representative,

the Registrar of Motor Vehicles or a representative to be designated by the Commissioner of Public Works, and an Assistant Attorney General, to be designated by the Attorney General. This Board has authority either to approve the action of the carrier or to order it to issue a policy or bond, as the case may be. Its findings are binding upon both parties unless they take an appeal to the courts.

The cost of policies or bonds is also recognized as important. Both in the act itself and in a companion act, the purpose of which is "to require insurance companies to file certain data with the Commissioner of Insurance," the Insurance Commissioner is required to undertake grave responsibilities for the approval of policy forms and bonds, for the promulgation of various underwriting rules and practices, for the determination of classes of risks, for the establishment of rates which shall be adequate, just, reasonable and non-discriminatory, and for the regulation of the remuneration of producers upon the particular business to be written under the law. To safeguard both carriers and policyholders, the law provides that an appeal may be taken to the courts from any order, finding or decision of the Insurance Commissioner.

This law is entirely experimental inasmuch as no other legislation similar in character or as extensive in scope has yet become effective in this country. It, therefore, creates many problems for the various parties in interest—motor vehicle owners, claimants, state authorities and insurance carriers. It is to the problems peculiar to insurance carriers that I intend to address myself.

## INSURANCE PROBLEMS

### I

#### COVERAGE

The form of policy or bond which meets the exact requirements of the law and goes no further will leave the motor vehicle owner unprotected against several phases of his potential liability under the law of negligence. It will offer protection within limits of 5/10 against liability for personal injury or death arising out of accidents which occur upon the public highways of the state of Massachusetts and will, therefore, be deficient in the following respects:



(1) It will not apply while the motor vehicle is being operated within the state but off the public highways as, for example, upon private property or upon private ways.

(2) It will not apply while the motor vehicle is being operated outside the state.

(3) It will provide coverage for limits of 5/10 only, although verdicts exceeding both these limits are possible under the law.

(4) It will provide coverage only for liability for personal injury or death and will not, therefore, touch the motor vehicle owner's liability for damage to the property of others.

Here are numerous coverages which an individual motor vehicle owner requires if his protection is to be complete. How are the carriers to meet this situation?

It seems probable that the motor vehicle liability policy or bond will have to be limited in its scope to the coverage specified by law, for it is expected that the majority of policyholders will demand contracts which provide just what the law prescribes and nothing more. Furthermore, the form of the policy or bond must be approved by the Insurance Commissioner; it must contain several provisions imposing serious responsibilities upon the carriers which they may not wish to apply to allied coverages; it must be written in accordance with special rules regarding underwriting, classification and cancellation; and the price will be promulgated by the Insurance Commissioner. Under the circumstances an endorsement attached to the motor vehicle liability policy or bond may not be practicable either from an administrative or from an underwriting point of view. Furthermore, individual motor vehicle owners may desire some of these allied coverages but not others.

Here is a problem of some importance, for naturally the carriers must continue to furnish adequate protection to their clients in spite of legislation which introduces new and irrational legal distinctions.

## II

### RATE MAKING

The duties of rate makers are not simple under the most auspicious circumstances. Past experience representing the cost of insurance under known conditions is usually available but there is always a question as to the fidelity with which these conditions will be reproduced during the future period for which

rates are intended. Influences may be at work which tend to vitiate past experience as a guide for the future. But the coverages and classifications remain unchanged so that there is reasonable continuity, and it is possible, by observing the experience over a long period of years and in diverse situations, to anticipate the effect of various factors which are known to react upon insurance cost from time to time. Normally, the rate maker has evidence of some sort which he may use to supplement his judgment. Under the Massachusetts Compulsory Automobile Liability Security Act, however, he has little or nothing upon which to base his predictions.

To be sure, there is a large body of statistical data available but this represents the underwriting results experienced by insurance carriers under the usual automobile public liability policies, the coverage of which does not closely correspond to that specified in the law. Furthermore, there is every reason to expect that conditions respecting the occurrence of accidents, the adjustment of losses and the administration of the business will be radically different under compulsory automobile insurance. Rate makers are, therefore, confronted with an extraordinary crisis. They are required to produce rates which conform to the tests of adequacy, reasonableness, fairness and equity from a paucity of facts concerning a situation which is unique in the annals of casualty insurance in the world at large. They do not have, as in the similar emergency which existed when workmen's compensation insurance was introduced in this country, any useful data concerning the cost of similar insurance in foreign countries. They stand alone with little to rely upon except their good common sense.

These circumstances will inevitably complicate the solution of the rate making problem. As is usual where judgment rules and facts are not available upon which to settle disputed points, there is likely to be difficulty in resolving differences of opinion on important questions. Fortunately the Insurance Commissioner is entrusted with the responsibility of producing rates so that there cannot be any extended controversy. But conditions are favorable for the exploitation of all manner of queer theories concerning rate making. For example: notwithstanding the fact that the law specifies that rates must be equitable and non-discriminatory, it is proposed to eliminate territorial and class

variations in cost so that a low priced private passenger car garaged in the rural districts would be charged the same premium as a high priced car garaged in Metropolitan Boston; it is argued that universality of insurance will materially reduce cost so that rates may be fixed at a figure which seems utterly unjustifiable in the light of our present knowledge. Other propositions equally strange will be offered in large numbers and technicians will be at a disadvantage because, without facts bearing on the specific matters in controversy, they will have no adequate evidence on which to base opposition to these propositions.

It will be interesting five years hence to check up the first set of rates promulgated under the Massachusetts Compulsory Automobile Liability Security Act in the light of the actual experience which will be available at that time.

### III

#### UNDERWRITING

The function of the automobile underwriter should be to see that the risks assumed by his carrier are of good moral and physical hazard. In the accomplishment of this objective he must be reasonably free to decline to insure certain risks, and if such risks should evade the barrier which he maintains, he must have considerable latitude in cancelling them before they have an opportunity to draw too largely upon the resources of the carrier. The privileges of declination and cancellation of risks are indispensable to careful underwriting. Both of these privileges are seriously restricted under the Massachusetts Compulsory Automobile Liability Security Act.

Motor vehicle owners cannot secure licenses to operate on the highways of the state without demonstrating their financial responsibility for automobile accidents. As a usual rule this will be done by purchasing a motor vehicle liability policy or bond, and because one of these instruments is essential if a license is to be procured, every motor vehicle owner, irrespective of color, race, occupation, age, physical or mental state, or previous condition of servitude, will demand coverage. The undesirable will not take "no" for an answer; in fact, he is not required to do so for he may appeal to the Board of Appeal on Motor Vehicle Liability Policies and Bonds and force the carrier to justify its

refusal to serve him. Similarly, if the carrier inadvertently accepts an undesirable risk and subsequently cancels it, its decision is subject to review by the Board. To be sure, the carrier may contest the ruling of the Board by taking its case to the courts, but this will involve litigation and expense. At any rate, the underwriter is not as untrammled as he should be. His decisions sometimes depend upon intuition and judgment, and he may not always be able to justify them until the adverse experience of the risk has been acquired; then it is too late to say anything except "I told you so," and that is not a very satisfactory explanation of an excessive loss ratio.

#### IV

##### PSYCHOLOGICAL REACTIONS

Finally, there are certain problems arising out of the psychological reactions of two parties in interest: policyholders and claimants.

Every one of the owners of the 750,000 motor vehicles in the state is a prospect for an insurance policy or a bond. Today not more than one-quarter of these persons have voluntarily purchased coverage; under the law the remaining three-quarters will be compelled to do so. No matter how cogent the argument in favor of compulsion may be, the fact remains that compulsion is obnoxious to the average citizen. He instinctively resents force or restraint when his personal freedom is at stake.

The new law, as does the Federal prohibition amendment, classifies as criminal a condition which many people find it difficult to consider particularly reprehensible; and because it does not affect one class alone but is universal in its application, the reaction against it will be extensive in scope and may be violent in character. The sentiment thus created will seek opportunity for expression; and it may be predicted that it will involve insurance carriers in a difficult predicament.

Instead of placing the responsibility where it belongs, uninformed persons will be inclined to hold the carriers responsible for the law, believing that they deliberately sought an opportunity in this manner to enlarge the scope of their operations. These persons will purchase the bare limit of compulsory coverage, and then complain when claims are legitimately rejected for lack

of coverage. They will grumble at the cost. They will find fault with underwriting practices; with what is done and with what is left undone. In a word, the carriers will be required to bear the brunt of a great deal of irrational and unjustifiable criticism, just as they did in the days of employers' liability insurance, when they were the victims of circumstances which they did not create and which were beyond their control.

Again it is questionable whether motor vehicle owners will be more or less careful in the operation of their vehicles under the new law. What is really needed is some efficient means of preventing the occurrence of automobile accidents. Whether compulsory automobile insurance will have this effect remains to be seen. It is not unlikely that the large body of motor vehicle owners who are compelled to insure for the first time will feel that they may take chances heretofore avoided. Nor is there any way of judging what the attitude of those who are now insured will be when they realize that Tom, Dick and Harry are brought into the system and are required to pay no more than they pay for coverage. Where careful and careless, efficient and inefficient drivers are all placed on an equal footing, there may be a tendency for the careful, efficient driver to relax to some extent the precautions which he has always observed. If these reactions take place, the frequency of automobile accidents will increase.

Under the law it will be generally known that some form of security is available every time anyone sustains personal injury in an automobile accident. Furthermore, the exact method of providing security in each case, together with the name of the carrier, if a motor vehicle liability policy or bond is outstanding, may be obtained upon inquiry. The result is bound to be an increase in the number of claims presented by members of the public. Then there is more than a possibility that the number of claims arising from accidents to passengers of private passenger cars (friends and members of the family) will materially increase. Today such claims constitute approximately 2% of the total number; under the new law with the conditions which will obtain, claims from this source will undoubtedly show a substantial increase in frequency. It is likely that all claims will be presented with the known limitations of the law in mind and, therefore, will uniformly be of substantial amounts.

How juries will react to the situation cannot be predicted but if experience is any guide it may be taken for granted that their attitude will be more liberal than heretofore, with the result that the cost of settlements and verdicts will show a decided upward tendency.

#### CONCLUSION

It may be said that I have taken a pessimistic view of conditions which will arise under the new law; that I have suggested certain problems which either will not present themselves or which, if they do occur, will be much less serious than I have described them. This may be true but I sincerely believe that the problems are inherent in the situation, and that they will be realized. I am confident, however, that insurance carriers will not find them insurmountable, and that they will continue in the future as they have in the past to render effective service in spite of all the obstacles thrown in their way. In fact, it is fortunate under the circumstances that the technical skill of numerous carriers is available for it requires the clash of many minds in crises like this to formulate the most efficient system for accomplishing the desired result.

ACCOUNTING METHODS FOR CASUALTY COMPANIES  
BY USE OF THE HOLLERITH SYSTEM

BY

THOMAS F. TARBELL

The main purpose of this paper is not to give a detailed description of the Hollerith system of accounting but rather to emphasize certain uses of the system in accounting work which are somewhat out of the ordinary or not in general use.

The system is so well known to all casualty men connected with accounting in companies or bureaus that a description of its fundamentals is scarcely justified. However, for the benefit of those in our membership who may not be familiar with the system I will describe briefly some of the more important features.

## BASIC RECORD

The basic record of any system of Hollerith work is the punch card. The standard card is  $7\frac{3}{8}$  inches by  $3\frac{1}{4}$  inches and contains forty-five spaces or columns. There are twelve positions in each column, the first two being designating or sorting positions and the remaining ten adding positions\*. For accounting purposes the card is divided into so-called fields. The number of fields and the number of columns included in the fields are limited only by the physical limitation of the card. As a rule cards are designed to meet the particular kind of accounting (premiums, losses, etc.) to be provided for. Fields are of two distinct kinds, sorting or designating fields and adding or monetary (amount) fields. It is the general practice to use the left hand section of the card for the sorting fields and the right hand section for the adding fields. This arrangement is the most convenient as the sorting process precedes the tabulating process and it is of advantage to have the sorting fields grouped as much as possible.

The Hollerith card shown on page 216 will serve to illustrate the points brought out in the previous paragraph. This card which is designated as a "premium analysis" card is used for all accounting (and certain experience) data in connection with written

\*On one form of tabulating machine all twelve positions can be used as adding positions.

Journal	Klnd	Identification No.	Number Policies	12		Term	Agent or Company	State	Policy Year	11		Premium	Amt. Ins. Nearest \$100.00 Wr. or Can.	23 24 25		1 2 3 4 5 6					
				Expiry Tr. No.	11					Class 10	Year			Year	Month	Month	Month	Month	Month	Month	
	00	00000	0	00	00		000	00	00	000	000000	00000	000000	000000	000000	000000	000000				
IT	11	11111	1	11	11		111	11	11	111	111111	111111	111111	111111	111111	111111	111111				
A	22	22222	2	22	22		222	22	22	222	222222	222222	222222	222222	222222	222222	222222				
B	33	33333	3	33	33		333	33	33	333	333333	333333	333333	333333	333333	333333	333333				
C	44	44444	4	44	44		444	44	44	444	444444	444444	444444	444444	444444	444444	444444				
D	55	55555	5	55	55		555	55	55	555	555555	555555	555555	555555	555555	555555	555555				
E	66	66666	6	66	66		666	66	66	666	666666	666666	666666	666666	666666	666666	666666				
Re-ins	77	77777	7	77	77		777	77	77	777	777777	777777	777777	777777	777777	777777	777777				
Re-ins	88	88888	8	88	88		888	88	88	888	888888	888888	888888	888888	888888	888888	888888				
C	99	99999	9	99	99		999	99	99	999	999999	999999	999999	999999	999999	999999	999999				

PREMIUM ANALYSIS

106857



premiums in case of all lines of insurance written by the Ætna Life Insurance Company ( Accident and Liability Department), the Ætna Casualty and Surety Company and automobile business written by the Automobile Insurance Company. This card will be referred to at a further point in the paper.

The first step in the process of Hollerith accounting is the transferring of the necessary data from the source to the Hollerith card. The individual Hollerith card when punched may be considered as representing or standing in the place of an individual entry in an original book of record of the day book or journal type, but does not take the place of any accounting record as it is not, from a practical standpoint, of a permanent nature. The storage requirements necessary to retain cards indefinitely would entail too heavy an expense.

#### SOURCES OF DATA FOR PUNCHING

In case of written premium Hollerith accounting the sources of the data are applications, renewal receipts, endorsements, cancelation and change sheets and miscellaneous or special forms. In the Ætna organizations it is the practice to use an original form, such as the application, as the basis of transcription wherever possible. An intermediate form is necessary for some lines such as fidelity and surety and in case of liability and compensation where several card records are necessary, such as audit, inspection, experience, expiration, collection, etc., it is advantageous to prepare all such cards, and an accounting card for transcribing to the Hollerith card, by the so-called "ditto" system. It is the practice of some companies to use an intermediate form exclusively as the source of written premium accounting transcription. This system has the advantage of releasing applications to the various underwriting departments with a minimum of delay but has the disadvantage of the expense of preparing the intermediate form in case of those lines of business where such form serves no other use than that of supplying data for Hollerith work.

Certain information such as kind of business, agent and state must be transcribed through the adoption of codes. As to whether or not the particular code numbers should be inserted on the form used as a basis for transcribing depends upon the practice of individual companies. If a company punches both accounting

and experience data on the same card or on separate cards but as consecutive operations, there is a certain advantage in having all information coded on the form as the punch operator does not have to go through the mental process of transferring to code or referring to a code in case of doubt as to the correct code number. In the Ætna organization the punching of cards for accounting and experience purposes are, with one exception, entirely separate and distinct operations and much of the data submitted for accounts punching purposes is not complete for experience punching purposes. Accordingly we furnish the operators with codes for kind of business, agent and state and rely upon them to select the proper code numbers. The code numbers are quickly memorized and we believe that this plan is less expensive than complete coding of data prior to receipt in the Hollerith department. I should point out that we have only about sixty agencies to consider for accounting purposes. If the number of agencies ran into the hundreds, it would be more economical to have the agency coded beforehand.

#### WRITTEN PREMIUM ACCOUNTING

Referring again to the "premium analysis" card illustrated on page 216, I will refer briefly to those fields which I believe may require some explanation. Before doing so I wish to state that I do not put this card forward as a model or worthy of imitation. I will state, however, that in my opinion, it is best suited to our own particular methods and requirements. I will refer to the fields according to headings:

*Company.* As we deal with the accounts of three companies it is desirable for us to devote a column to designate the company to which the item applies. Where a single Hollerith department handles the accounting work of two companies this column can be saved by using different colored cards or by using the eleventh and twelfth positions (generally known as the "X" and "Y" positions) in the first column of the identification number field.

*Journal.* This column is provided to indicate the kind of premium transaction for annual statement purposes (written, reinsurance, return and not taken), including the identification of payroll audit premiums for Schedule P purposes. The abbreviations stand for the following premium transactions:

R—Applications, renewal certificates, renewal receipts, and first year premiums on three year annual premium policies.

LT—Second and third year premiums on three year annual premium policies.

A—Additional premiums (other than payroll audit).

B—Payroll audit additional premiums.

C—Payroll audit refund premiums.

D—Return premiums (other than payroll audit.)

E—Not taken premiums (flat cancellations).

Reins W—Written reinsurance ceded.

Reins C—Canceled reinsurance ceded.

*Kind.* This field designates the line of business.

*Identification No.* This column requires no comments. I wish to say, however, that policy numbers should be kept down to as few digits as possible and the practice of starting a new series of policies with 1,000,000, 2,000,000, etc., should be discouraged. Six columns is a liberal allotment for policy numbers. This will take care of policy numbers running to 2,999,999 by double punching (*i. e.*, punching two positions in the same column) using the X and Y positions in the first column of the field to designate the millions. Double punching, however, should be avoided wherever possible.

*Number of Policies.* This column is for statistical rather than accounting purposes and is provided to furnish the number of written and not taken risks.

*Expiry.* The year and month of expiry are required for unearned premium reserve purposes. In case of companies computing this reserve on the semi-annual basis only the year of expiry is necessary.

*Term.* This column also is necessary for unearned premium reserve purposes.

*Agent or Company.* This field is used to designate the agent in case of direct business and the company in case of reinsurance assumed or ceded. In case of reinsurance assumed or ceded, company is required for state tax return purposes.

*State.* This field is required for state tax return purposes.

*Policy Year.* This field is used for the purpose of allocating

liability and workmen's compensation premiums to Schedule P by policy years.

*Class.* This is not an accounting field but an experience field and is used for recording premiums by classes in case of fidelity and surety business. Fidelity and surety experience being on a calendar year rather than a policy year basis, we are able, by inserting this field, to avoid the necessity of punching an extra set of cards for experience purposes.

*Premium.* This column requires no comments.

*Amount of Insurance, etc.* This column is used for accident business and further is necessary in case of our organization because of the requirement for showing the amount of automobile fire insurance in the fire annual statement blank.

*Return Premiums.* The return premium column requires no comments.

*Premium Canceled.* The canceled premium column is necessary for unearned premium reserve purposes.

*Year—Month.* The year and month is punched out for identification of the cards as to year and month which the premiums are put through the records. These columns are gang punched.

It will be noted that the card in question provides for both debit and credit premium transactions. Some companies use separate cards for debit and credit premiums and, owing to the limitation of the card, it is necessary to adopt this procedure where a company provides for both accounting and experience data on the same card. The advantage of having both debits and credits on the same card is that total debits and credits can be obtained for a particular tabulation by a single run of cards through the tabulating machine, whereas if separate cards are used two runs are necessary.

#### CHECKING OF CARDS

The method of checking employed by the Ætna organization is to have two sets of cards punched in different colors by different operators and compared individually by matching and holding up to the light. Some companies use a verifying machine for checking purposes. We have always favored the duplicate card system as practically the only additional expense as com-

pared with the verifying system is the cost of the cards and we also find considerable use for the duplicate set.

### BALANCING AND CONTROL

After the duplicate sets of cards have been compared, they are run through a tabulating machine and balanced. Under our system, two methods of control of premium writings are in use. In some cases accounting control figures accompany the data submitted for punching while in others the control figures are furnished by the Hollerith department. Under both methods there is maintained a balance between the Hollerith and accounting departments. In some cases this balance is on a net premium (debits less credits) basis and without distinction as to line of business. In this connection I wish to emphasize that in my opinion it is of considerable value in the interest of economy to provide for a control balance between the accounting and Hollerith departments on the basis of a net total without distinction as to lines of business or kind of transaction, any further analysis of the net total being furnished by the latter department. This rule is followed wherever possible.

### TABULATIONS

All accounting tabulations of whatever nature are made monthly. This is due in part to our practice of preparing rather complete monthly statements on the same basis as the annual statement. A monthly tabulation also has the advantage of overcoming peak loads in the tabulating work which result where certain tabulations are made quarterly, semi-annually or annually.

The first tabulation of the written premium cards is by line of business, by kind of premium transaction. The cards are first sorted by line of business and next by kind of premium transaction ("journal"). The journal groupings to produce the written premium entries for the general books are as follows:

Gross premiums written or renewed . . Journals R, LT,  
A and B.

Return Premiums on policies canceled . Journals C and D.

Premiums on policies not taken . . . . . Journal E.

Reinsurance written is a separate tabulation.

While the above journals as grouped represent in theory either total debits or total credits, in practice some or all will be made up of both debits and credits. This results from restorations or reversing entries. For example, if a policy is canceled at short rates, which would be a journal D transaction, and is later reinstated the second transaction would be a journal D transaction, the premium being entered in the debit premium column.

From the tabulated results statements are prepared and furnished to the bookkeeping division and postings are made direct from these sheets to the proper accounts in the general ledgers. The sheets are bound in loose leaf binders which are designated as written premium journals. The control totals previously referred to are posted to monthly sheets in a division of the accounting department and the accumulated totals balanced monthly with the Hollerith department totals.

I have gone somewhat into detail in explaining our method of arriving at the premiums written for the general books as I believe that the simplicity of the system warrants my bringing it to your attention. It will be noted that under this system the Hollerith results control the general books, but that a further control is maintained in the accounting department.

#### UNEARNED PREMIUM RESERVE

For tabulating the unearned premium reserve the cards, which, regardless of the last previous tabulation are in order by lines by journal groupings are further sorted by term and by year and month of expiry, the debit and credit journal groupings being preserved. The results are transferred direct from the tabulating machine to working reserve sheets, separate sheets being used for "written" (debits) and "terminated" (canceled premium credits). A copy of the working reserve sheet is shown on page 225. All items with expirations in the current month or prior are grouped and entered on the first line. These, of course, do not affect the reserve but are carried to the sheets for balancing purposes. The working reserve sheet results are transferred to the final reserve sheets and the net amount of premiums in force at the end of the month compiled. As the final reserve sheet is

a rather large size sheet it is not illustrated. The headings of the various columns, however, are as follows:

- Term
- Expiration
- Business in force (beginning of month)
- Business written (during month)
- Business terminated (during month)
- Business in force (end of month).

By using a perforated sheet and filing in a ring type loose leaf binder the part showing the business in force at the end of the month is torn off after the reserve is compiled and transferred to be used as the business in force at the beginning of the next month, thus doing away with the necessity of recopying.

The gross and reinsurance unearned premium reserves are computed separately and the results transferred to summary reserve sheets of substantially the same form as the Recapitulation of Premiums on page 7 of the annual statement blank.

The unearned premium reserve is computed on the semi-monthly basis in case of the business of the *Ætna Life Insurance Company* (Accident and Liability Department). The method used is that described by Mr. E. E. Cammack, Vice President and Actuary, *Ætna Life Insurance Company*, in a \*paper presented to this society in 1915 and is as follows:

“A movable slip is prepared, as illustrated below, with the lines at the same distance apart as those on the unearned premium reserve sheet, with the fractions  $1/24$ ,  $3/24$ ,  $5/24$  . . .  $23/24$  entered one below the other, expressed in decimals.

VALUATION FRACTIONS

<u>Premiums Expiring in</u>	<u>Fraction Unearned</u>
0— 1 month	.041667
1— 2 months	.125000
2— 3 months	.208333
3— 4 months	.291667
4— 5 months	.375000
5— 6 months	.458333
6— 7 months	.541666
7— 8 months	.625000
8— 9 months	.708333
9—10 months	.791667
10—11 months	.875000
11—12 months	.958333

\*A system of analyzing Workmen's Compensation Business by Means of Perforated cards. *Proceedings*, Vol. II, page 90.

"This slip is placed beside a table of premiums upon policies in force classified by months of expiration, and the amount of premiums for each month is successively multiplied by the corresponding factor upon the slip by means of any standard calculating machine, the product after each multiplication has been made not being effaced from the machine. After the last multiplication has been made, the total on the face of the machine will be the computed amount of unearned premiums. Similar slips can be prepared for policies whose terms are 2, 3, 4, 5 years, etc."

#### REINSTATEMENTS

In discussing the tabulation of written premiums I referred briefly to reinstatements. Such items present difficulties from the unearned premium reserve standpoint. In our organization we handle this in a rather simple manner. Our rule is to disregard the reserve premium which should theoretically be reinstated if the policy expires in the current calendar year. In case of items with expirations subsequent to the current calendar year, a memorandum or blotter record is kept containing the necessary reserve data and the reserve premium to be reinstated. From this record a special set of cards are punched up following the end of the year. These are tabulated on separate working reserve sheets and incorporated with the balance of the end of the year reserve data in the regular reserve sheets.

The result of the above procedure is a slight understatement of the reserve during the year.

#### MISCELLANEOUS TABULATIONS

Some of the other more or less usual written premium tabulations are the following:

(a) Liability and compensation additional and refund premiums by policy years.

(b) Net premiums written by states by kinds of business.

(c) Premiums written by agencies by lines of business. (These tabulations can be made with a scope varying from net premiums written to premiums written subdivided into gross, return, not taken and net, or in case of liability and compensation, gross, miscellaneous additional, payroll audit additional, payroll audit refunds, return, not taken and net.)

(d) Reinsurance premiums written and ceded by states by lines of business by reinsuring companies.

(e) Reinsurance premiums in force by lines of business by reinsuring companies.





Part II of the New York Casualty Experience Exhibit calls for net premiums written on direct business. Home office reinsurance assumed presents no difficulty but where a company accepts reinsurance through branch offices or general agents, and such business is treated as agency business, the ordinary Hollerith card providing only a combination agency or company field does not meet the situation. It is therefore desirable to provide, if possible, separate fields for agency and company. We meet this situation by punching the agency in the "agent or company" field and the reinsured company in the "amount of ins." field.

#### TABULATION RECORDS

I have previously stated that all tabulations are made monthly. The various tabulations are transcribed monthly to summary cards, the postings being made direct from the tabulating machine. An illustration of the type of summary card used is given on page 228. An accumulative total is maintained so that any desired information in connection with our regular tabulations can be had at a moment's notice. An alternative method which is somewhat less expensive is to draw off the tabulations on the printing tabulator and punch master cards to be tabulated semi-annually or annually. We believe, however, that the advantages of our present method are worth the slight additional cost.

#### ORDER OF TABULATIONS

The order of tabulations in Hollerith work should be given careful consideration. Under an accounting system depending upon the Hollerith department for the written premium results, the first tabulation must be written premiums by lines by journal groupings. Of the remaining tabulations necessary for a monthly statement, the next in importance is the unearned premium reserve.

In the *Ætna Life Insurance Company* (Accident and Liability Department) our major written premium tabulations for compensation and liability insurance are the following:

- Premiums written.
- Premiums written by agents.
- Premiums written by states.
- Premiums written by policy years.
- Unearned premium reserve.

The tabulations are carried out in the order given and a study of this order, considering our grouping by journals, will show that the amount of sorting required is reduced to a minimum. I might add that as an extra check on our work the duplicate set of cards punched primarily for checking purposes is used for the tabulation by agents and the written premium results are not released to the bookkeeping division until a balance between the two sets is effected. In case of necessity the duplicate set could be used for still further tabulations.

#### AUTOMOBILE SUSPENSION ENDORSEMENTS

Before leaving the matter of written premiums and reserves, I will refer briefly to our method of handling the accounting in connection with automobile suspension endorsements during the suspension period. We make no book entries in connection with these endorsements but handle the accounting entirely through the Hollerith system. A record of all suspensions is furnished the Hollerith department as the endorsements are received by the underwriting department and a special card is punched with such of the usual accounting data as is necessary and with the exception that the year and month of suspension are punched instead of the year and month of expiration. The cards are then sorted by month of suspension and a reserve is built up to offset the reserve automatically taken down. For example: At the end of January our automobile suspension reserve sheets would show suspension premiums in force effective in November, December and January. We would compute the special reserves as follows:  $5/24$ ths of the November premiums,  $3/24$ ths of the December premiums and  $1/24$ th of the January premiums. The premiums referred to are, of course, the annual premiums written in the policies. As notices of termination of suspension are received the Hollerith department receives a record and withdraws the original card from file. This method is extremely simple and avoids the necessity of putting any entries through the accounting records until the period of suspension is completed and the exact credit due the assured determined.

#### PAID PREMIUM AND COMMISSION ANALYSIS

Practically all companies find it desirable to compile a record of paid premiums and commissions by agencies. This is also

**ÆTNA LIFE INSURANCE COMPANY**  
**ACCIDENT AND LIABILITY DEPARTMENT**

.....Compensation..... Department

Year <u>1925</u>		State <u>Vermont</u>			Agent					
DATE WRITER	PREMIUMS WRITTEN	MISC. ADDITIONALS	ADDITIONAL EARNED PREMIUMS	MISC. REFUND PREMIUMS	REFUND PREMIUMS	FLAT RISKS	FLAT CANCELLATIONS	NET GROSS PREMIUMS	RANK	
Jan.	437375		14664		5224		31906	414909		
Feb.	522429		327433		33027		145519	671316		
	<u>959804</u>		<u>474097</u>		<u>38251</u>		<u>177425</u>	<u>1086225</u>		
Mar.	502627	350	105356	5280	12876		24286	565871		
	<u>1462431</u>	<u>350</u>	<u>447433</u>	<u>5280</u>	<u>51127</u>		<u>201711</u>	<u>1652096</u>		
Apr.										
May										
June										
July										
Aug.										
Sept.										
Oct.										
Nov.										
Dec.										

necessary for most companies because of the requirements of the New York Casualty Experience Exhibit. Prior to September, 1923, it was the practice in our organization to spread the paid premiums and commissions on the paid premium journals by lines of business and to compile the agency results by hand methods. At that time we decided to handle practically all paid premium and commission results by the Hollerith system. We redesigned the paid premium journals to provide only a single column for premiums and a single column for commissions. Totals only of premiums and commissions are entered on the journals from the recapitulations of the accounts and the accounts are then sent to the Hollerith department where the premiums and commissions are punched out by lines and balanced to the daily control sheets accompanying the accounts. At the end of each month the premiums and commissions are analyzed by lines of business and statements furnished the bookkeeping division from which journal entries are prepared closing the general premium and commission accounts and setting up the premiums and commissions by lines of business for posting to the general ledgers. Agency reinsurance assumed is reported separately on the account recapitulation and the Hollerith department statements separate the direct and assumed business. The cards are then tabulated by agencies and posted to cards similar to that illustrated on page 228.

A copy of the Hollerith card used for the above analysis is given on page 231. The card is simple and requires no comments. It will be noted that ample fields have been provided for recording both agency and reinsured company in case of agency reinsurance assumed.

#### PREMIUMS IN COURSE OF COLLECTION

Since September, 1925, the detail of premiums in course of collection for casualty business at our New York branch has been maintained by means of the Hollerith system. The plan is briefly as follows: Duplicate cards are punched from the copy of the bill mailed to the broker or agent. These cards are checked in the usual manner and balanced to the daily control of net writings. One set is used to tabulate the writings for the month and make such other tabulations as the branch requires. The other set is filed into a perpetual inventory file by brokers.

All cards of this set are filed including not takens. Subsequently the cards representing the not taken items and the original charges therefor are pulled from the file, the debits and credits balanced and the cards discarded. Paid items are withdrawn from the file and the cards balanced to the daily net cash received (the commissions are not punched originally but only as the paid items are pulled from the file). The single column paid premium and commission journal principle is also in effect at the New York branch. At the end of the month the paid premium and commission analysis is made from the pulled cards. Items which are paid for but have not gone through the writings and put into file are taken care of by punching two additional cards of different colors and distinct from the colors used in the regular punching. One card goes in with the pulled cards to balance the paid premiums and commissions and the other is placed in a special "paid not charged" file. The regular file is gone through periodically with the paid not charged cards and as the original charge cards are located they are pulled, matched up with the corresponding paid not charged cards, balanced and destroyed.

Partial payments are taken care of by punching two new cards, one showing the amount of payment and corresponding commission which goes in with the regular paid cards and the other showing the balance still unpaid which is filed back with the outstanding. Both cards are marked "partial payment". The original outstanding card is, of course, withdrawn from file. This also is marked "partial payment" and filed away in a special file for reference purposes should any question arise making it necessary to look up the original item.

This system does away with the keeping of between 7000 and 8000 individual brokers ledger accounts and, although we have not had enough experience as yet under the system to pronounce it an unqualified success, the results to date have been satisfactory. The printing tabulating machine is used extensively in this work and in addition to the Hollerith file of outstanding items by brokers, a similar file of such items in the form of collection slips is maintained. Listings of the individual Hollerith items representing brokers accounts are made periodically on the tabulating printing machine and a reconciliation effected with the collection slips.

108323

Kind of Policy	Report No.	General Agent	Reporting Agent	Premium			Commission			Credit Premium			Credit Commission			Date Rec.	
																12	11
																Tr	Mo
0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0	0 0 0 0	0 0	0 0 0 0	0 0	0 0 0 0	0 0	0 0 0 0	0 0	0 0 0 0	0 0	0 0 0 0	0 0	0 0
1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1	1 1 1 1	1 1	1 1 1 1	1 1	1 1 1 1	1 1	1 1 1 1	1 1	1 1 1 1	1 1	1 1 1 1	1 1	1 1
2 2	2 2 2 2	2 2 2 2	2 2 2 2	2 2	2 2 2 2	2 2	2 2 2 2	2 2	2 2 2 2	2 2	2 2 2 2	2 2	2 2 2 2	2 2	2 2 2 2	2 2	2 2
3 3	3 3 3 3	3 3 3 3	3 3 3 3	3 3	3 3 3 3	3 3	3 3 3 3	3 3	3 3 3 3	3 3	3 3 3 3	3 3	3 3 3 3	3 3	3 3 3 3	3 3	3 3
4 4	4 4 4 4	4 4 4 4	4 4 4 4	4 4	4 4 4 4	4 4	4 4 4 4	4 4	4 4 4 4	4 4	4 4 4 4	4 4	4 4 4 4	4 4	4 4 4 4	4 4	4 4
5 5	5 5 5 5	5 5 5 5	5 5 5 5	5 5	5 5 5 5	5 5	5 5 5 5	5 5	5 5 5 5	5 5	5 5 5 5	5 5	5 5 5 5	5 5	5 5 5 5	5 5	5 5
6 6	6 6 6 6	6 6 6 6	6 6 6 6	6 6	6 6 6 6	6 6	6 6 6 6	6 6	6 6 6 6	6 6	6 6 6 6	6 6	6 6 6 6	6 6	6 6 6 6	6 6	6 6
7 7	7 7 7 7	7 7 7 7	7 7 7 7	7 7	7 7 7 7	7 7	7 7 7 7	7 7	7 7 7 7	7 7	7 7 7 7	7 7	7 7 7 7	7 7	7 7 7 7	7 7	7 7
8 8	8 8 8 8	8 8 8 8	8 8 8 8	8 8	8 8 8 8	8 8	8 8 8 8	8 8	8 8 8 8	8 8	8 8 8 8	8 8	8 8 8 8	8 8	8 8 8 8	8 8	8 8
9 9	9 9 9 9	9 9 9 9	9 9 9 9	9 9	9 9 9 9	9 9	9 9 9 9	9 9	9 9 9 9	9 9	9 9 9 9	9 9	9 9 9 9	9 9	9 9 9 9	9 9	9 9

PAID PREMIUM ANALYSIS

An incidental compilation that we expect to obtain from the paid cards for 1926 is the amounts paid brokers as commissions, required for income tax purposes. This compilation when made by hand is a rather slow, laborious and costly operation.

A copy of the card used in connection with the above system is given on page 233. This requires but little explanation. The card is not a complete accounting card as it is not designed to produce state results or unearned premium reserve data. The journal code is the same as that used at the home office. The first column in the Branch and Broker field designates the local branch, *i. e.*, Brooklyn, 42nd Street or 100 William Street. The remaining four columns are used for broker.

The card could be better arranged. For example, the "credit premium" and "debit commission" fields could be interchanged to advantage. It was not practical to use an ideal arrangement when the card was designed for the reason that an inventory was made by the Hollerith system of the premiums in course of collection as of August 31, 1925, without any thought of adopting the present system. When it was later decided to adopt this system it was necessary to design the new card to harmonize with the original inventory cards.

While the above system is a specialized agency accounting operation, the writer feels that it can be adapted to fit into the conditions of home office premiums in course of collection accounting and is at the present time making tests at the home office with that end in view. In case of companies punching cards in duplicate, as in the case of the *Ætna* organization, the set of cards necessary for keeping up the perpetual inventory is automatically provided.

One of the most difficult features in connection with the operation of such a system is the punching up of the original inventory.

### LOSS ACCOUNTING

For Hollerith loss accounting work we use the same card for both accounting and experience purposes, except for accident and health where for experience work we use the loss cards designed by the Committee of Five on Statistics of the Bureau of Personal Accident and Health Underwriters.

A copy of our loss card is given on page 235. The card, so far as



112937  
 CO. 2 LIFE CAS  
 AUG. CO.

JOURNAL	BRANCH AND BROKER		DATE OF POLICY		POLICY YEAR	BILL NUMBER					KIND	DEBIT PREMIUM					CREDIT PREMIUM					DEBIT COMMISSION					CREDIT COMMISSION					DATE CHARGED		DATE PAID		
	11	12	MO	YR		0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9

N. Y. BRANCH PREMIUM ANALYSIS

accounting data is concerned, is simple and requires very little explanation. It will be noted that column 1 gives us both the company and the annual statement division of losses. The date of accident is used for determining the amount of losses paid during the current year on losses incurred in previous years for certain lines of business in connection with compiling Schedule O of the annual statement blank. The kind of payment field is for experience purposes except column 22, position 4, which covers specific loss expense and is used for both accounting and experience purposes. The card, in harmony with our other cards, provides for both debit and credit payments. This materially facilitates the computation of the annual statement data.

In general our methods of checking cards, making tabulations and recording tabulations are the same for losses as for premiums. Two sets of cards are punched, one serving for accounting work and the other for experience work.

#### SINGLE COLUMN LOSS JOURNAL

Prior to January 1, 1926, our loss journals provided two columns for each line of business, one for loss and the other for expense. The loss journals are maintained in an accounting division known as the voucher audit division. Losses are paid principally by drafts issued by field adjusters. When a draft is issued a carbon copy thereof is mailed to the voucher audit division where it is held in file awaiting presentation of the original draft for payment by the bank. As the original drafts are presented, the duplicate copies are drawn and a check requisition made up listing the draft numbers and amounts. The duplicate copies of drafts contain spaces for inserting the necessary Hollerith data for accounting and experience purposes. The voucher audit division, under the system in effect prior to January 1, 1926, classified the drafts to the best of their ability as respects line of business and loss or expense and entered the analysis of each check requisition based upon their classification on the loss journal. The requisitions, drafts and copies were then forwarded to the claim department where the analysis was checked and all other accounting and statistical data entered. The requisitions and copies of drafts were then forwarded to the Hollerith department for punching and balancing. Under this system many



correcting entries were necessary on the loss journals owing to errors in posting and more particularly to failure of the voucher audit division, because of unfamiliarity with loss technicalities, to properly distinguish between loss and loss expense payments and resulting in considerable annoyance to all three departments interested and a material effort and expense incident to making corrections and balancing. Beginning January 1, 1926, we adopted so-called single column loss journals similar to the paid premium journals previously described. The single column is headed "Loss and Expense". The procedure followed is substantially the same as previously except that the voucher audit division enters only the total amount of the check requisition in the "Loss and Expense" column. The Hollerith department balances the cards to the total of each requisition and to the totals for the month as shown by the loss journals. After this balance is effected the cards are analyzed by lines divided between loss and loss expense and statements furnished the voucher audit division from which journal entries are prepared closing the "Loss and Expense" accounts and setting up loss and expense by lines of business. Further statements of losses by annual statement divisions are furnished the bookkeeping division for general ledger postings.

The foregoing applies to general casualty lines. In case of accident and health the procedure is somewhat different but the same principle is used. In fact a single column loss journal has been in use for accident and health business since January 1, 1924, and the success of the system for accident and health led to the decision to adopt it for the general casualty lines.

There is one point worth mentioning in connection with this subject. At the present time we pay practically all losses, both in the field and at the Home Office, including reinsurance losses and reinsurance salvage, by draft. This makes fewer entries on the loss journal and materially reduces the number of check requisitions handled by the Hollerith department.

#### GENERAL

One of the advantages of the Hollerith system is its flexibility, as illustrated by the number of different sets of tabulations economically obtained from a single card. One of its greatest possibilities which I have attempted to emphasize in this paper

is that of accounting analysis, as a substitute for detailed accounting by the usual books of account. It is not a panacea for all accounting troubles. It will do most anything accounting-wise but not always as satisfactorily or economically as other methods. It also has its drawbacks, one of which is the impracticability of starting any tabulating work until a month's cards are complete. Where an accounting analysis is demanded at an early date after the close of any month and considerable sorting and tabulating is necessary, it cannot compete against hand methods where postings are made daily and the desired results obtained by simply adding certain columns as soon as the last item is posted.

One subject that I commend to the thought of those interested in Hollerith and accounting work is that of Hollerith analysis of expenses; that is, the use of a single column expense journal along the lines of the single column paid premium and loss journals described in this paper and the analysis of expense by accounts departments, lines of business, etc., through the Hollerith system. The greatest difficulty to overcome is that indicated in the preceding paragraph. The writer has given considerable thought to this subject and has made tests. The results have not been encouraging, but in case of a single company organization, where the problem is considerably simpler than in a three company organization, the chances of success would seem to be promising.

## RETIREMENT SYSTEMS FOR PUBLIC EMPLOYEES IN NEW YORK STATE

BY

RAINARD B. ROBBINS

Prior to the year 1917, there was no pension plan of importance for any class of public employees in the State of New York which was on a sound financial basis. Many plans were in operation and not a few had come to the point where it was evident that they would soon have to reorganize or cease to pay retirement benefits. Within a period of four years, four retirement systems were organized, each of which covers larger classes of public employees than had previously been covered and each of which, it is believed, is organized on a sound financial basis.

It is the purpose of this paper to compare similar provisions of these four large retirement systems, to discuss some of the problems which have arisen in the administration of these systems and to present for discussion in the light of the experience of these four systems, the advisability or inadvisability of certain types of provisions in retirement systems for public employees.

The names of the retirement systems in question are listed below together with the date of organization of each and the number of members in 1925. Opposite the name of each system is given a letter by which the system will be designated in the remainder of this paper.

### FOUR LEADING RETIREMENT SYSTEMS FOR PUBLIC EMPLOYEES IN NEW YORK STATE

Name	Year Organized	Number of Members in 1925	Letter to designate system
Teachers Retirement System of the City of N. Y.....	1917	25,649	A
N. Y. City Employees Retirement System	1920	29,928	B
N. Y. State Employees Retirement Sys- tem.....	1921	17,402	C
N. Y. State Teachers Retirement System..	1921	29,057	D

A word of explanation is in order regarding the membership of these systems. The membership of system A is properly

described by the name of the system. System B does not include teachers, policemen, firemen and street cleaners of the City of New York; otherwise it includes all but comparatively small classes of public employees of the City. System C originally included state employees only. By amendment it has come to include large groups of employees of cities, counties, towns and villages and provision is made whereby a municipality whose employees are not now members of, or entitled to membership in, a retirement system supported in whole or in part by the State or the municipality, may arrange to make its employees eligible to membership in system C. System D is open to all public school teachers of the State with the exception of those in New York City.

#### MANAGEMENT

Systems A and D are managed by retirement boards organized for this particular purpose. System B is managed by the Board of Estimate and Apportionment of the City of New York. This board has many duties of an entirely different nature in connection with the administration of the government of the City of New York. The affairs of the retirement system are apt to be only incidental in the voluminous calendar of each meeting of the board. System C is managed by the Comptroller of the State of New York. Here again the management of the system is only incidental among the duties of the responsible head. Each of the four systems is by law given the powers and privileges of a corporation. None of them is a department or division of state or city government.

#### BENEFITS AND CONTRIBUTIONS

Each of these systems provides a superannuation benefit, sometimes called a service benefit, and a disability benefit. All but system D provide a death benefit. The superannuation benefit is of most importance and will be considered first. Although this benefit differs in different systems, it is such in each that an employee who has from 30 to 35 years of creditable service may expect to be able to retire on something near half pay. Furthermore, all systems require contributions from members and a member who begins his service after the system is established and who serves during a period of from 30 to 35

years, may expect his contributions to furnish about half of his retirement allowance. In each system, deductions from salaries of members are accumulated at 4% interest as savings accounts and the amount in an individual member's account is available in case of his resignation, dismissal or death.

When an employee is retired for superannuation in any one of the four systems, a pension is payable which depends upon the number of years of service as a member, the number of years of creditable service before the system was organized, and upon the salary during the last five or ten years of service. The amount of the pension does not depend explicitly upon the age of the pensioner. In addition to this pension, the service pensioner receives whatever annuity can be purchased with his accumulated salary deductions.

Each of the systems gives credit for service prior to the organization of the system. To state in detail just what prior service is creditable would not be profitable in this paper. With certain important exceptions, creditable service is limited to such service as would entitle an employee to membership in the system if rendered after the system was organized.

With minor exceptions, credit for prior service is dependent upon continuous membership in the system. In other words, if a member with prior service credit discontinues membership in a retirement system, as a result of a change of occupation or otherwise, and later returns to membership, he is classed as a new entrant and has only the credit available to those who entered the service after the system was organized. In this paper, those with full prior service credit will be called present employees and all others will be called new entrants.

It should be apparent from the foregoing paragraphs that the general scheme of the four systems is the same so far as service retirement allowances are concerned. Differences will now be taken up in the conditions for retirement, in the method of determining the pension portion of the retirement allowance and in the amount of the contributions of members. It should be stated at this point that comparatively minor exceptions to general provisions are omitted in this paper and as a result, some of the statements, especially with regard to service requirements and retirement benefits, may not be strictly true in every individual case.



System A provides for service retirement upon attainment of age 65 or upon the completion of 35 years of service. System B has three classes of employees; laborers, mechanics and clerical employees. Members of these classes were originally eligible for retirement at ages 58, 59 and 60 respectively. By amendment each of these retirement ages was reduced by five years. System C provides retirement at age 60 while system D requires 35 years of service or the attainment of age 60 with twenty-five years of service.

Originally systems A, B and C required retirement at age 70 while system D has had no compulsory retirement age. System A has retained this requirement; systems B and C have modified their requirements so as to permit an employee beyond age 70 to continue in service under certain conditions which involve medical examination of the employee and approval of the immediate employer.

In each system, the pension benefit is proportional to the average salary for the last five or ten years of service; this is called in this paper, the final average salary. In systems A and B, the final average salary was originally the average for the last ten years; this has been changed in both systems to the average for the last five years. In systems C and D, the average has always been for the last five years.

In many respects systems B and C are very much alike. As stated above, system B has three classes of employees; the statements which follow regarding system B apply to clerical employees, *i. e.*, to the class whose members may under the amendment retire at age 55. Upon service retirement, systems B and C provide a pension of  $1/140$  of final average salary for each year of service since last becoming a member and  $2/140$  for each year of creditable prior service, (*i. e.*, creditable service prior to the organization of the system).

Systems A and D provide a pension of one-quarter of final average salary and, to present employees, an additional pension of  $1/140$  of final average salary for each year of creditable prior service.

Each system provides a disability benefit in case medical examination discloses that the employee is sufficiently disabled as to be unable to perform his duties. The management of each system has discretionary powers of importance regarding such

retirements. Each system requires a certain number of years service before an ordinary disability benefit is available. Systems A and B require ten years service while systems C and D require fifteen years.

Systems B and C provide special disability benefits for disability caused by accident sustained in the performance of duty. These benefits are quite liberal and are available regardless of the period of service. Systems A, B and C provide explicit death benefits. In system A, this benefit is available only to those eligible for service retirement and is equivalent to the last six months salary preceding death. System B provides the same benefit but it is available to all members. System C, by amendment in 1926, provides one-twelfth of the compensation earnable during the twelve months immediately preceding death for each year of service, but not to exceed half of such compensation. It should be added that accumulated contributions of members are returned in case of death, in addition to the benefits described above.

Systems B and C provide special benefits in case of death due to accident sustained in the performance of duty, the benefits taking the form of payment of accumulated contributions and a pension of half of final average salary to designated beneficiaries.

### *Options*

Under each of the four systems, upon retirement for either service or disability, the pensioner has the option of choosing, instead of the retirement allowance calculated to be paid during his lifetime, a smaller allowance to be paid during his lifetime with the agreement that this is to be followed upon his death by further regular payments or by a lump sum payment to a designated beneficiary. On the basis of mortality tables adopted by the retirement system, the various optional modifications available are, of course, actuarially equivalent to the maximum retirement allowance at the time of retirement. It should be noted, however, that in every case the member has the right to choose an option at the time of retirement. The experience of the retirement systems here discussed, during the few years which have elapsed since their organization, shows clearly that the privilege of choosing options has resulted in selection against the systems. Many cases are on record which show the choice

of an option because the prospective pensioner felt that death was imminent. In fact, it is clearly established that in many cases, those in charge of the retirement systems have advised that options be chosen in cases where the retiring member seemed to have very little chance of living any length of time.

Selection against the systems is most apt to occur in case of retirement for disability. Probably in the majority of cases of service retirement, the member is in normal health and if so, the choice of an option should not, on the average, place extra burdens on the system. In case of disability retirement, on the other hand, the member is not in normal health and being thus on guard against the possibility of early death, it is probable that those who choose options will show heavier mortality than do those who might be termed normal disabled lives.

All four of these systems have had to deal with what have come to be known as death-bed retirements with choice of options. Systems B, C and D have protected themselves to a large extent by provisions of law which enable them to require that, in case an option is chosen, the retiring member must live thirty days after application for retirement in order that the payments under the option shall be made. System A has no such provision and has paid over a million dollars in optional settlements in cases where the retiring members died shortly after retiring.

### *Discontinuance Benefit*

Systems B and C provide retirement benefits for those who meet special service requirements and whose services have been discontinued through no fault of their own. This includes persons who are thrown out of the public service because of changes in political control or because the positions which they occupy have been discontinued. System C has a particularly liberal benefit of this type which may result in pensioning persons at ages as low as forty years merely because they have lost their positions in the public service. There are those who feel that this is a most flagrant perversion of the purposes for which retirement systems are organized and that it shows what dangers are involved when a legislative body can change a retirement system at will.

*Accrued Liability*

It should be clear from the foregoing paragraphs that the basic unit in calculating the employer's liability is a year of service. In each system, the employer's liability for service prior to membership is thought of as accrued when membership begins. It is recognized in each case, however, that it is neither practicable nor necessary to fund this liability at once and different plans have been adopted in the different systems to spread the burden of building up this fund over a period of years.

System A requires an annual appropriation of one million dollars to support the accrued liability and provides that in case this is insufficient, the remainder needed shall be furnished year by year on the cash disbursement plan. System B requires the annual appropriation of 6% of the accrued liability as of the date when the system began operations. System D collected for the support of the accrued liability, 2.5% of the salaries of members during the first year of operation and 2.5% of the salaries of all eligible teachers whether members or not, for the following four years. The law provides that after the actuarial valuation as of July 31, 1925, a contribution rate shall be determined which will furnish a contribution equal to 4% of the present value of the liability in question at that time. This rate is to be used thereafter and since it applies to the salaries of all members, it will yield an increasing contribution to support the accrued liability. System C uses a method similar to that of system D.

Although the idea of an accrued liability has been useful in impressing upon employers the seriousness of a pension plan, it is submitted that this idea has been misleading in many cases. Incidentally it has led to the charge that until this liability is funded, a retirement system is insolvent. The process of funding, in practically every case introduces elements which are obviously arbitrary and which lead to a lack of continuity in the contribution rates of employers. If, instead of considering any liability as accrued when the system begins, the contribution of the employer were calculated for each member as a level premium to be paid during the remainder of the period of service before eligibility for retirement, we would have the advantages that no liability is hypothecated when the system begins operations and that the employer's contributions change gradually from year to year. Under this method there would never be a time to look

forward to when the employer's contribution rate is to be suddenly decreased. The layman does not thoroughly understand this matter but he thinks he sees clearly that if such a time is going to come, as it will under the plans now in use, the contribution for each year preceding that time can be shaded by extending the period for the heavier contribution or by reducing the contribution rate gradually instead of suddenly.

### SOUNDNESS OF FINANCIAL BASIS

There are two fundamentals which distinguish a retirement system which may be said to rest on a sound financial basis:

1. The prospective income of the system is so determined as to be able to support the promised benefits.
2. The sources of income are reliable.

Each of the four systems here discussed provides for revision of contribution rates in case experience demonstrates that the rates in use are too small or too large. Three of the four systems require that contributions on behalf of the employer shall be appropriated by legislative bodies while the fourth takes these contributions from the certain taxes collected for school purposes before distribution to school districts of the state. Each system provides that the employee's contributions shall operate as a savings account so that no complications are here involved. Anyone of these systems can be wrecked by legislation. Three of them can be wrecked by failure of legislative bodies to appropriate funds. The likelihood of such action is a matter of opinion but an important element of safety is the power of the members over legislative bodies through their votes. On the other hand, each of these systems has felt the pressure of efforts to liberalize benefits without regard to cost. Furthermore, liberalizations which have cost millions of dollars to the employers have been made. There is very serious fear on the part of many whose interests are completely centered in the welfare and permanency of this type of retirement system, that excessive liberalizations of benefits may cause the method to fail, through refusal or impossibility to appropriate sufficient funds to maintain the systems.

It should be stated that while this paper was in preparation, a legal decision was handed down which will apparently have

an important effect upon the operations of system B. Supreme Court Justice M. Proskauer handed down a decision to the effect that amendments to the law of system B which had been enacted by the Municipal Assembly of the City of New York are void. The principal amendments in question resulted in lowering the retirement age by five years, in making final average salary the average of the last five years instead of the last ten years salary and in allowing prior service credit regardless of date of joining the retirement system in case the member in question has fifteen years or more of prior service. It will be readily seen that this is a very serious matter to many individuals. A number of retirement allowances will be discontinued as a result of this decision and the status of the corresponding pensioners will be questionable. Retirement allowances have been determined recently on the basis of salaries for the last five years of service and in those cases where a pensioner was eligible to retirement under the law as it read before amendment, the final average salary will apparently have to be changed with a consequent change in the retirement allowances.

The Court's opinion in this case points out that the Municipal Assembly is specifically prohibited by the Home Rule Law from adopting a local law to supersede a state statute if such local law "applies to or affects any provision of law relating to the property, affairs or government of a county or counties." It then points out that some of the members of the Retirement System are County or State employees paid by the City as agent for the County or State. An appeal has been taken from this decision to the Appellate Division of the Supreme Court but as yet no decision has been rendered by that Court. If, after these adjustments are made, the decision above mentioned should be reversed, the procedure will apparently be changed again in accordance with the later decision.

#### QUESTIONS SUGGESTED BY THE FOREGOING ANALYSIS

It is proposed to discuss to some extent a number of questions regarding retirement systems for public employees in general, the questions being the outgrowth of the experience of the four systems described in the earlier part of this paper. It is hoped that this may lead to expression of opinion which may be helpful in guiding some retirement systems in the future.

*Benefits*

What benefits should be provided by retirement systems for public employees?

At a time when retirement systems are rapidly becoming more popular, not only for public employees but for industrial employees as well, it would probably be useless to discuss the question of whether or not any retirement system for public employees is justifiable. Assuming that we should have such organizations, however, there is a wide difference of opinion as to what benefits should be provided. There are those who feel that the most that should be included is an annuity benefit to superannuated employees. Others would include besides the superannuation benefit, a benefit for disability not caused by accident in the performance of duty, a more liberal disability benefit in case of accident, a sickness benefit, a death benefit and an unemployment benefit. Furthermore, there is a wide difference of opinion as to how large these benefits should be and as to how they should be supported.

None of the financially sound retirement systems for public employees in New York State provides a sickness benefit as such. However, disability is not sharply defined and considerable discretion is exercised in deciding as to disability retirement. Probably no system would claim to offer an unemployment benefit but the discontinuance benefits of systems B and C might well be described as unemployment benefits.

There has been considerable discussion of the question of whether or not a death benefit is appropriate. Opinion on this question seems to turn on the purpose for which the retirement system is conceived. There is the point of view that the employer has a certain responsibility with respect to the employee which he does not have with respect to the dependents of the employee. In fact, it is held by some that the employer is not interested in the domestic affairs of the employee; that any responsibility which the employee may undertake regarding others is no affair of the employer. This argument is used to support the conclusion that a death benefit has no place in a retirement system.

On the other hand, there is the view that the reason for the existence of a retirement system is the benefit to society which is involved in its operation; that a death benefit will frequently enable a family to avoid abject poverty and that society in

general will thus avoid the loss consequent upon the ill fortunes of some of its members. This is, of course, one of the fundamental arguments for life insurance, and death benefits of a retirement system may well be considered as group life insurance for the employees involved. Possibly the most generally accepted purpose of a retirement system is to improve the service of the employees. From this point of view, it is difficult for some to see that the death benefit is of value.

It is of interest that only two of the four systems discussed in this paper, systems A and B, provided explicit death benefits from the beginning and that system C introduced the death benefit only after five years of operation. Yet all of these systems have offered options at the time of retirement and these options frequently result in death benefits of much larger value than any of the explicit death benefits. It seems queer that the theoretical value of a death benefit should be so solemnly questioned when considered in connection with retirement systems which already allow a broad choice of options upon retirement. It is true that the death benefits are available only before retirement, while optional benefits are available only after retirement so that to some extent they supplement each other.

Assuming that death benefits are desirable, question has been raised as to whether or not they should be, as they are, in the form of lump sum settlements. Only the accidental death benefits of systems B and C are in the form of annuity payments. There is also question as to whether or not optional benefits should be available upon retirement. This is questioned especially in connection with disability retirements. A strong argument for the choice of an option upon retirement is that a member can, at that time, make a choice of benefits more suitable to his circumstances than could be made earlier. If he has no dependents, he will want the maximum annuity for life; if he has a wife, he may want the benefit continued in whole or in part during the life of his wife after his death. From this point of view, permission to choose an option upon retirement is most valuable in obtaining the greatest good from a retirement system. The point which is overlooked entirely is that permission so to choose allows full play to the human tendency to select against the retirement system in case of ill health. This shows up especially in cases of disability retirement.



Probably the most popular optional benefit is the one designated as option number one in each of the four systems. It consists of a lump sum payment to a designated beneficiary or to the estate, upon the death of the pensioner, of that part of the reserve for the retirement allowance at the time of retirement which has not been consumed in payments to the pensioner. There are those who feel that this option should not exist while others would make it compulsory for all members with dependents. It is not clear that the beneficiary is helped as much by a lump sum settlement as she would be by a continuation of the pension payments. It is also held that some of the questionable methods which have been employed to obtain the benefits of option number one would not be used to get the less alluring but possibly more valuable benefits consisting of a continuation of the original pension.

It is futile to theorize regarding benefits desirable for retirement systems without considering the cost. Probably the most fundamental difference between the four systems here discussed and the systems which preceded them is that a more serious effort has been made in case of each of the four systems to anticipate the cost of the benefits promised and to provide income sufficient to support these benefits from sources as nearly unquestionable as it was possible to devise. There are those in pension circles who are anxious regarding the various liberalizations of benefits for fear that the time will come when legislative bodies will fail to appropriate the funds necessary to meet the obligations. On the other hand, there are those who are interested in liberalizing the benefits apparently without regard to the cost, seemingly taking the attitude that the sources of public funds are unlimited.

In this connection, one must not lose sight of the fact that practically all public employees have votes in political elections and that their interests affect the votes of many others. This fact is reflected in the widespread tendency to attempt to broaden the benefits of retirement systems without increasing the contributions of the employees.

### *Flexibility*

Each of the four systems has fixed conditions for retirement. With few exceptions a minimum age, usually 60 years, is set for superannuation retirement. We frequently hear the opinion

expressed that age 60 is too early for retirement. Yet we all recognize that some employees are superannuated at age 55 while others are as valuable as ever if not more valuable than ever at age 65. None of these systems allows a variation of the minimum requirements under any circumstances.

In each system, disability benefits are available in case the applicant has credit for a specific amount of service, either 10 or 15 years. If 15 years is required, no power exists to allow a benefit in case only 14 years credit is available.

System D will retire an employee of age 60 if he has 25 years of service but will not retire an employee of age 69 unless he has 25 years of service; yet there is little question that for the good of the service, many of those between ages 60 and 70 with less than 25 years service should be retired. At the other extreme, 35 years of service entitles one to retirement regardless of age.

System C requires for service retirement that application be made within 15 days after leaving the service; system D requires that the employee shall be a teacher during the year preceding application for retirement. Each system is required to issue prior service certificates and if these have been in effect one year, they can be changed only by discovery by the retirement system of error or fraud.

These facts are stated to show a lack of flexibility in the retirement systems and as a preface to the question as to whether or not any more flexibility would be advisable. Should the management of a retirement system or a medical board have any discretion as to the minimum conditions for either service or disability retirement? Should a person who has fulfilled the service requirements for retirement be in any danger of losing his right to retire by delaying his application a week or a year or should this right be one which he can exercise at any time?

Should a retirement system make superannuation retirement depend upon amount of service as well as age or does this tend to counteract the very purpose of the system? It is suggested for consideration that a retirement system should not have a service requirement for retirement and that the portion of a retirement allowance furnished by the employer to new entrants should be proportional to the amount of service. This is the plan of systems B and C. Where possible, benefits should change

gradually with service rather than to change suddenly from zero to a substantial amount.

These are only a few of the many seemingly arbitrary provisions of the different retirement system laws which cause much trouble in administration. If fifteen years service is necessary for disability retirement, it is only a question of time until the case will turn up where fourteen years service is established and every effort will be made to find another year, often by "interpretation" of the law. If the year cannot be found, the disabled employee will be kept on the payroll, receiving full pay although unable to work, thus practically liberalizing the disability benefit by preceding the legal benefit by an indefinite sick leave at full pay.

Should more than one benefit be available to a member at a given time? For instance if an employee eligible for service retirement is suddenly taken ill and the physician says he can live only a short time, it may at present be advisable for the prospective beneficiary to have computed for comparison the disability benefit with choice of option number one, the service retirement benefit with choice of option, and the death benefit without retirement. Should such a condition exist if it can be avoided?

If application for service or disability retirement must be made within a specified time after having left the service, distressing cases will immediately turn up where, through ignorance, neglect or hope of returning to service, this requirement will not have been fulfilled. If disability retirement with choice of option gives the possibility of a large benefit upon the death of the prospective pensioner, cases will be numerous where questions must be settled as to the authenticity of a signature or of a "mark" or as to whether or not a specified time elapsed between the time of application for disability retirement and the time of death of the applicant.

Apparently many of the difficulties which have developed in the operation of these retirement systems are due to the fact that we have not had much experience along this line. The solutions of many of these difficulties are not easy and it would seem that these are properly problems for the consideration of members of this Society. It should be stated that some of the seemingly arbitrary provisions in the laws of the retirement systems were put there deliberately for particular purposes; not

infrequently, however, they operate otherwise than was apparently intended.

In all insurance work, "close cases" are sure to appear but the companies have long since learned to write their contracts in such a manner as to minimize the possibility of misunderstanding and to eliminate as much as possible in the way of arbitrary conditions. Doubtless, when we have had experience for three-quarters of a century with retirement systems, many of the difficulties which we now experience will be ironed out. It is believed that the members of this Society are by training and occupation qualified to make suggestions from which retirement systems should be able to profit.

THE "PERMANENT" RATE MAKING METHOD  
ADOPTED BY THE NATIONAL COUNCIL ON  
COMPENSATION INSURANCE

BY

WINFIELD W. GREENE AND WILLIAM F. ROEBER

Compensation insurance has felt for some time the need of a reasonably stable rate making plan, Frequent and drastic changes in method have lessened the public's confidence in insurance carriers, strengthened "sales resistance" to needed rate increases, and disturbed company underwriting policy.

Considering the fact that the American compensation system is still in its teens, it is reasonable to assume that thus far these difficulties have been in the main, unavoidable. However, in April, 1925, the National Council after thorough investigation adopted an ostensibly permanent rate making plan.

Unlike the proverbial laws of the Medes and Persians, this plan can, be varied, or even changed, for good and sufficient reason duly established. The plan was, however, adopted with the intention of departing therefrom only for cause, and the record of the past year confirms the good faith of this undertaking.

HISTORY

The first American compensation insurance rates, made for New Jersey in 1911, were based upon "workmen's collective" experience, modified by underwriting judgment. These rates were shortly found to be redundant, and material reductions were made. For a time as other states adopted compensation laws their rates were established by reference to New Jersey.

The Massachusetts law (1912) required the insurance commissioner to approve rates as to adequacy and in 1914 the rates there were revised in the light of the first actual American compensation experience. The premium rates adopted for the New York law (1914) were based on the same data, and in the first national rate revision (also 1914) the new rates were in

all cases based on the Massachusetts experience modified by \*"flat law differentials".

The rates resulting from the 1914 revisions appeared for the majority of states to be more than adequate. Some reductions were made for individual classifications and it was thought that no increase in rate levels would be required for a considerable time. But the experience of the 1916 policies began to look bad, and investigation indicated that the speeding up of industry due to war contracts had increased the accident rate. Another general revision took place in 1917 in which "relativities" were reviewed and rate levels substantially increased. The experience from a number of states was combined, still by the use of flat law differentials, the result being modified by factors (based largely on judgment) intended to cover increasing cost due to "lagging of the act", and "abnormal industrial activity".

The higher rates were hardly in effect before the experience bettered. Policy years 1918 and 1919 were consistently "good years" and in most states the period 1917 to 1920 was favorable throughout. The general increase had not been needed, at least not fully, because of material wage increases accompanied probably by a decline in the accident rate due to industry's having overcome the problem of war-time organization.

The general revision of 1920-21 resulted in substantially decreased rate levels (based upon policy year 1920 costs), and in material changes in relativity, due to new national experience combined by partial experience differentials.† Once

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\*A "flat law differential" is a factor intended to express the ratio of the cost of a given compensation law to that of some other compensation law. If, for example, in the 1914 revision the "law differential" for a certain state was 1.53, the implication was that for a typical array of accidents, the total benefits (including medical and funeral benefits) of the act in question were 53% greater than those of the Massachusetts act. The weakness of the "flat law differential" lies in the fact that there is no such thing as a "typical" distribution of accidents according to nature and severity because human occupations differ as to the kind of accidents produced and no two states have the same "payroll distribution" according to industry.

†Both American and European experience demonstrates that during the first two or three years of any compensation law, employees do not as fully avail themselves of compensation benefits as they will later on after they have become fully educated as to its possibilities.

‡See foot note page 260.

more the rate level changes were made at about the wrong time, for the depression of 1921-22 marked the beginning of a period of rising compensation costs.

After the revision of 1920, the Actuarial Committee of the National Council on Workmen's Compensation Insurance kept in touch with the rate making problem and in 1922 it proposed that future rate revisions follow the assumption that compensation costs, *with due allowance for benefit changes and variations in wage rate*, may be regarded as stationary not only from year to year, but also from state to state. The revision of 1923-24 was committed to this principle "with reservations". This theory was followed in combining and converting experience, but not in fixing rate levels, because even with the wage variable eliminated changes in compensation cost were too momentous to be disregarded.

In spite of material wage increases, the loss ratio trend (on present manual rates and present law) was found for most states to be upward through policy years 1921, 1922 and 1923. Some felt that this up-swing was temporary, while others felt it to be a reflection of an underlying tendency toward increase which practically might be regarded as permanent. Still others felt the issue to be obscured by immaturity of available data. It is not surprising that consistency cannot be read into the conclusions of the 1923-24 revision.

It appears then that each rate revision prior to 1925 followed a theory conforming in each case to the view most generally prevailing at the moment as to probable future conditions. In fact, the unrealized ambition to achieve a constant loss ratio has been the only consistent element in the situation.

Realizing the urgency of promptly rechecking the results of the 1923-24 revision, the Council speeded up the collection of 1924 Schedule "Z", and prepared for a general review of rate levels, which took place in the fall of 1924. On that occasion the paramount importance of a permanent rate making policy was stressed and generally admitted. It was not, however, until the following spring, (1925) that the Rates Committee of the Council endorsed such a standard plan, after the most intensive and extensive examination of compensation rate making principles thus far made.

## GENERAL CONSIDERATIONS

It is apparent that for the compensation business the foremost present consideration is the adherence to a definite rate making policy.

It is of nearly coordinate importance that this policy meet as fully as possible the following requirements:

1. *Equity.* Rates should be made according to a plan which assures that in the long run neither employers nor insurance companies shall pay more than their fair share of compensation cost, *i. e.*, that for the long run, rates will be both adequate and reasonable.
2. *Responsiveness.* Rates should be so made that they will be consistent with the latest available statistical evidence.
3. *Stability.* Both absolutely and relatively there should be as little yearly variation in class and individual risk rates as may be and still serve the major considerations of Equity and Responsiveness.

## RATE LEVELS

The rate level should conform to the loss ratio of some stated period. The specific questions to be considered are:

1. How many years of experience shall be used?
2. To what extent shall loss ratio data<sup>†</sup> be employed?
3. Shall the experience of several years be combined by simple addition or shall a "weighted<sup>‡</sup>" formula be employed?

The formulas which seemed most worthy of consideration are as follows:

1. Five years Schedule "Z" unweighted.
2. Five years Schedule "Z" weighted (weights 1, 2, 3, 4, 5 in that order).

NOTES.<sup>†</sup>—Loss ratio or "aggregate" data show premiums and losses for all kinds of injuries and all classifications (industries) combined, while Schedule "Z" includes an exhibit, *by classification*, of payrolls, premiums, and losses subdivided into the six (Fatal, Permanent Total, Permanent Partial Major, Permanent Partial Minor, Temporary and Medical) loss divisions. A sample of the form employed by the National Council in calling for loss ratio data is attached (Exhibit A).

<sup>‡</sup>By "weighting" we mean assigning progressively more weight to the experience of the later years. The weights used in the various tests were "1" assigned to the earliest policy year of the experience period, "2" to the next, and so on.



3. Three years including one year of loss ratio data.
4. Five years including one year of loss ratio data.

The method of fixing rate levels should be determined to satisfy the considerations of equity, responsiveness and stability, and according to these criteria the four formulas may be rated as shown in the table on page 258.

If we could safely assume that there is no persistent upward or downward trend in compensation costs, the most substantial advantages would be in favor of the use of five years Schedule "Z" unweighted. Although it is not generally maintained that an upward trend can continue indefinitely, it is true that the tendency thus far has been upward to a material degree and we are not justified in assuming that in the future there will not be extended periods when compensation costs will be subjected to successive changes in the one direction or the other. Tests indicate that the accumulated underwriting loss in the event of a protracted upward trend or the accumulated underwriting profit in the opposite event would be much less with the three year formula, using loss ratio data, than with the five year formula using Schedule "Z" only. The three year formula gives somewhat less stable rates but equity and responsiveness combined outweigh stability in importance.

The five years Schedule "Z" weighted and the five years including loss ratio data are half-way measures not wholly satisfactory from any standpoint.

Accordingly the use of three years experience including one year of loss ratio data was adopted as a standard to be used in determining rate levels. The Rates Committee approved the use of loss ratio data for the last year entering into the determination of the rate level with the understanding that the National Council Staff wherever possible will use experience brought down to at least twenty-seven months and in no event less than twenty-four months developments\*. In practice it is found possible in most states to wait for Schedule "Z" figures on the last year.

NOTE.—\*This means loss ratio data reported as of a date 27 months after the inception date of the year of issue in question. For example 27 months developments on policy year 1923 would be reported as of April 1st, 1925. In practice it is not necessary to call for 27 months developments on loss ratio data because the annual revision dates have been so established that except for a few "July 1st states", for which 24 months developments are used, it is possible to bring in Schedule "Z" on all years.

Formula	Equity	Responsiveness	Stability
(1) 5 years Schedule "Z" unweighted	Satisfactory if underlying trend of compensation cost is neither consistently upward nor downward	Unsatisfactory because of lag†	Satisfactory
(2) 5 years Schedule "Z" weighted	Satisfactory if underlying trend is horizontal. If consistently upward or downward slightly less unfair than (1)	Unsatisfactory in slightly less degree than (1) and for same reason	Somewhat less stable than (1)
(3) 3 years with loss ratio data	If horizontal trend, just as satisfactory as either (1) or (2). If upward trend much fairer to carriers and if downward trend much fairer to employers than either (1) or (2)	Much shorter lag hence more satisfactory than either (1) or (2)	More unstable than either (1) or (2)
(4) 5 years with loss ratio data	Approximately on par with (2)	More satisfactory than either (1) or (2) but less so than (3) because of weight given older experience	Almost as stable as (1) and more stable than either (2) or (3)

NOTE.—†Lag as used in this paper means the time elapsing between the expiration date of the last policy issued during the experience period and the effective date of the rates based on the experience of that period.

CLASSIFICATION PURE PREMIUMS

In fixing the standard for rate levels, it was necessary to choose to some extent between equity and responsiveness on the one hand, and stability on the other. In selecting a basis for classification pure premiums no such dilemma is presented, for the only criteria which particularly apply do not conflict. These criteria are:

- (1.) Stability as to relativity, and
- (2.) High credibility to class and state experience (recognition of the experience of the individual class and state to fullest extent possible).

Both these criteria point to the use of as long a period of experience as can be used without justifying the charge of "obsolete data", and unquestionably the general consensus of opinion favors five years.

In order to afford as broad as possible a use of local experience, the following principles were adopted:

1. Any classification in a given state shall be "self-rated" to the extent to which it conforms to the following standards.

- (a) Serious†—expected losses‡ not less than 25 times the average state cost of a serious case
- (b) Non-serious†—expected losses not less than 300 times the average state cost of a non-serious case.
- (c) Medical†—expected losses not less than 80% of the non-serious standard.

2. Where the expected losses of a classification in a given state do not warrant full "credibility", the local pure premiums

NOTES.—†Losses are shown in three divisions as follows:

- (a) Serious—compensation (*indemnity*) for deaths, permanent total disabilities, and major permanent partial disabilities.
- (b) Non-Serious—compensation (*indemnity*) for minor permanent partial disabilities and temporary disabilities.
- (c) Medical—cost of medical and hospital treatment for all types of injuries.

‡Expected losses are the losses implied by a given set of payrolls and pure premiums (the latest national pure premiums in this instance). Accordingly these expected losses are obtained by applying the latest national pure premiums to the respective classification payrolls of the state in question.

are "weighted" against the national pure premiums in the following proportions:

Expected losses—proportion of self-rating Standard	Proportion of Local	Proportion of National
75—100%	.75	.25
50—75%	.50	.50
25—50%	.25	.75
00—25%	.00	1.00

3. National pure premiums are to be reviewed every other year employing the five years' latest Schedule "Z" experience combined by the use of "experience differentials." In conjunction with this bi-ennial revision, a continuous study is to be made of classification wordings and relativities from the engineering standpoint.

4. In translating the five most recent years of Schedule Z data upon the basis of the present law and latest medical costs†, to the rate level basis as already defined, the same factors are applied to all classifications. This is justified, on the ground that

\*We have already defined "flat law differential" (see foot-note, page 254 of this paper). As opposed to "flat" differentials, we have "partial" differentials, *i. e.*, differentials applying to certain features of the Workmen's Compensation Act. The other major distinction in the matter of differentials is between "theoretical" and "experience" differentials. A theoretical differential reflects a comparison of the benefit scales as written in the respective laws without regard to the differences which may exist between two states in material and human conditions. The experience differential, on the other hand, reflects the result of a comparison of actual costs and in the experience differential, therefore, is involved not only differences in benefits but also the effect produced by variation between communities in such matters as the following:

A—Racial composition of population.

B—Economic development of the community.

C—Attitude of employees and employers towards the compensation law.

D—Type of administration and attitude of those administering the law.

†By this is meant—

(a) Payrolls as reported;

(b) Indemnity losses brought to the benefit level of the latest state law;

(c) Medical losses brought to cost level indicated by the average medical manual loss ratio under policies issued in the latest year for which Schedule "Z" is, at the time, available. Because of the rapidly increasing medical cost it was felt that a three year basis for medical would produce too great a lag.

(a) separate factors for industries or groups of industries cannot be determined without the unwarranted exercise of arbitrary judgment, and (b) investigation has demonstrated that the "trend" of the pure premium for the individual class cannot generally be regarded as significant.

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It is the aim of the National Council to review, and propose needed changes in, compensation rates in each state annually as of a uniform date selected for that state. This practice is in contrast with the former policy of general (countrywide) revisions at irregular intervals, and is a most important element in the Council's policy. Obviously, in view of changes in statutes and in economic conditions, fairness to both employers and carriers can be maintained only by "keeping everlastingly at it".

## APPENDIX

## DETAILS OF PROCEDURE

To give a better understanding of the methods employed in the review of individual classification experience of a particular state, we are outlining in detail the various steps involved. In order that the outline may take concrete form, we will make the following assumptions\*:

(a) The classification experience to be used will be for policy years 1918-1922 inclusive.

(b) The rates will be keyed to the level of the three policy years 1921, 22, 23; 1923 policy year experience being taken from loss ratio data.

The steps in order are as follows:

1. Calculate expected losses for all classes† by applying 1923 revision national pure premiums on basic level to state pay-rolls, 1918-1922 inclusive.

2. Determine credibility criteria as shown on page 259 paragraph 1 of this paper using local (Schedule "Z" totals are here employed) 1918-22 experience on state present law level. Criteria in terms of expected losses (see preceding paragraph) are obtained by dividing criteria determined on local 1918-22 experience respectively by the following ratios:

(a) Serious

$$= \frac{\text{total local actual losses (present law basis)}}{\text{total expected losses (determined as in par. 1 above)}}$$

(b) Non-serious—analogue to serious

(c) Medical—analogue to serious, except actual is to be on 1922 medical manual loss ratio basis.

3. Allocate (separately for serious, non-serious and medical) classes to credibility groups, and sum expected losses by these three parts, and the five credibility groups.

NOTES.—\*These assumptions correspond to the situation which confronted the Council, say, in June or July, 1925.

†"All Classes" means all Schedule "Z" classes except Coal Mine, Vessel and other Maritime, Chemical and "a" Rated classes; and except discontinued classes which cannot properly be assigned to any existing class.

4. Convert individual classification experience for each year to state present law and 1922 medical level.

5. Sum actual losses on present law level by three parts and five credibility groups.

6. Before determining "formula pure premiums" (*i. e.*, "weighted" as between local and national in accordance with formulae shown on page 259 paragraph 2 of this paper) it is necessary that not only the indicated pure premiums but also the national pure premiums reflect the state present law level. The basic pure premiums are put on this level by means of "preliminary correction factors" determined separately for serious, non-serious and medical in each case by the below procedure:

Let  $A$  = Actual Losses on state present law level

$E$  = Expected Losses (national class pure premiums on basic level  $\times$  local payroll)

and  $C$  = Preliminary correction factor

$$C = \frac{\Sigma (.25 A_2 + .50 A_3 + .75 A_4 + A_5)}{\Sigma (.25 E_2 + .50 E_3 + .75 E_4 + E_5)}$$

Subscripts:

- |  |     |   |     |
|--|-----|---|-----|
| (1. Would refer to group with 1.00 local credibility |     |   |     |
| 2. Refers to group with                              | .75 | " | "   |
| 3. " " " "   | .50 | " | "   |
| 4. " " " "   | .25 | " | "   |
| 5. " " " "   | .00 | " | " ) |

Proof =

Let  $A'$  = Adjusted losses (*i. e.*, expected losses as determined above  $\times$  preliminary correction factor).

$$\begin{aligned} \Sigma A' = \Sigma & (1.00 A_1 + .00 C. E_1 \\ & .75 A_2 + .25 C. E_2 \\ & .50 A_3 + .50 C. E_3 \\ & .25 A_4 + .75 C. E_4 \\ & .00 A_5 + 1.00 C. E_5) \end{aligned}$$

$$\text{or } \Sigma A' = \Sigma A - \Sigma (.25 A_2 + .50 A_3 + .75 A_4 + A_5) + C \Sigma (.25 E_2 + .50 E_3 + .75 E_4 + E_5)$$

Substituting for  $C$ , we find that  $\Sigma A' = \Sigma A$

7. Apply the preliminary correction factors determined as above to the national pure premiums on basic level.

8. Determine formula pure premiums for all classes giving proper weight to local and national experience in accordance with the formula shown in paragraph 2, page 0. (For classes having no local credibility, the formula pure premiums will be obviously the basic pure premiums modified by the preliminary correction factors.)

9. Apply formula pure premium by three parts to 1922 policy year payrolls keeping classes having local credibility separate from classes having no local credibility.

10. Apply present manual rates to 1922 policy year payrolls keeping groups separate as in (9).

11. Determine 1921-2-3 loss ratio based on present manual rates, present law and 1922 medical cost. Compare such loss ratio with permissible and apply indicated increase or decrease to premiums at present manual rates (based on 1922 payrolls as determined in (10) above) to obtain "required premiums".

12. By the use of the following formula determine "final correction factor" which when applied to the formula pure premiums ("serious" and "non-serious" only)† will reproduce the required increase or decrease in rates.

$$\begin{aligned} & \Sigma (1922 \text{ Payrolls} \dagger \times \text{Present Manual Rates}) \\ & \qquad \qquad \qquad \times \frac{1921-2-3\text{-Loss Ratio}}{\text{Permissible L.R.}} \\ = & \Sigma \left( 1922 \text{ Payrolls} \times \left\{ \left[ \text{Formula Medical P. P.'s} \times \frac{1}{1-E} \right. \right. \right. \\ & \left. \left. \left. + \text{Formula Indemnity P. P.'s.} \times \frac{1}{1-E} \times C \right] + .01 \right\} \right) \end{aligned}$$

NOTE.—†The "final correction" applies to indemnity only, medical having already been keyed to the latest available policy year medical manual loss ratio.

NOTE.—‡In determining the final correction factor and in the "balancing out" process policy year 1922 payrolls are used. Loss ratio data is not reported by classification and accordingly it is impossible to employ the payrolls of the three policy years entering into the rate level calculation. Accordingly the middle year, 1922 in this case, is assumed to represent the average payroll distribution of the three years entering into the rate level calculation. In practice, it is possible in most states to bring in Schedule "Z" on the last year in which case the payrolls of the three rate level years are used instead of the one.



Where  $C$  = Final Correction Factor  
and  $E$  = Expense Loading

13. In order that the "indicated" and "national" as well as the formula pure premiums might be exhibited on the rate level basis the final correction factor (determined as in (12) above) is applied to

- (a) Indicated,
- (b) National, and
- (c) Formula Pure Premiums on present law level

14. Compute present rate pure premiums as equal to the existing manual rate less catastrophe and expense loadings, split in three parts.

15. The form shown herewith (Exhibit B) is used in exhibiting the experience for pure premium selection.

EXHIBIT "A"

NATIONAL COUNCIL ON COMPENSATION INSURANCE  
 January, 1925 Call for Loss Ratio Experience

Company \_\_\_\_\_

State of \_\_\_\_\_

Year of Issue	NET PREMIUMS WRITTEN AND LOSSES PAID TO DECEMBER 31st OF					Losses Incurred as of December 31, 1924
	1920	1921	1922	1923	1924	
1920	N. P. Written			XXX	XXX	XXX
	Total Losses			XXX	XXX	XXX
1921	N. P. Written	XXX			XXX	XXX
	Total Losses	XXX			XXX	XXX
1922	N. P. Written	XXX	XXX			XXX
	Total Losses	XXX	XXX		XXX	XXX
1923	N. P. Written	XXX	XXX	XXX		XXX
	Total Losses	XXX	XXX	XXX		XXX
1924	N. P. Written	XXX	XXX	XXX	XXX	XXX
	Total Losses	XXX	XXX	XXX	XXX	XXX

KINDLY EXCLUDE COAL MINE DATA



## REMARKS ON COMPENSATION DIFFERENTIALS

BY

PAUL DORWEILER

To understand fully the cost relation of two compensation acts it is necessary to consider in detail the individual parts which appreciably affect the amount of compensation awarded. As the present day compensation laws have so many elements which enter to a perceptible degree into the determination of the cost of the act it becomes highly desirable to have for expressing their cost relationship some simple expression which is representative of the whole law. It is the function of the compensation differential to serve in this way as an approximate measure of the cost relation of two compensation acts.

*Differentials as Index Numbers*

When classified as a part of the subject matter of Statistical Theory compensation differentials belong to the division known as index numbers. These are numbers used to express the relative magnitude of statistical groups or of aggregates of variables when considered as of different times, or as of different places, or as of both different times and places. A typical compensation law has in its scale of benefits many cost items which apply in varying combinations to individual accidents. It is the problem in compensation differentials to determine indices for the cost of industrial accidents when considered for different times in the same state, or for the same time in different states, or for different times in different states.

*Compensation Differentials Defined*

The general meaning given to the term "differential" in the past has involved the comparison of the compensation costs or cost levels of two states. The term has also been used to designate more specifically the flat factor necessary to modify the pure premiums of one state so that when these modified pure premiums are applied to the payrolls of another state that state's aggregate losses will be reproduced exactly. The meaning attached to the word in these remarks is not in conflict with these usages.

Considering any one specific compensation law with reference to another compensation law which has been selected as the standard or basic law the compensation differential of the specific law relative to the other as the basic law shall be defined as the specific law's compensation cost per unit hazard-weighted payroll exposure when expressed in terms of the same cost unit of the basic law. The general object is to compare, for the two laws, the cost per unit payroll exposure when these payrolls refer to the same classification or to classifications of equal hazard. When, as in the general case, the classifications are not all of equal hazard it is proposed to weight the payrolls according to the hazard severity of the classifications.

For this purpose let it be assumed that there is available a true relative measure of the hazard in classifications. This measure may be conceived to consist of the loss in time and expense per unit time exposure which society suffers on account of accidents occurring within the classification. The relative numbers obtained by applying such a measure to each classification would be used in both the specific state and the basic state for weighting the payrolls which would then become "hazard-weighted payrolls."

No set of relative numbers based on the "time and expense" loss per unit time exposure is available. However, the cost of a representative compensation law is presumably approximately proportional to the loss in time and expense to society on account of compensation accidents. The payroll exposure for classifications may also be considered approximately proportional to the time exposure. In place of the unavailable relative numbers desired for weights there may now be substituted a new set of approximately the same relativity which express for each classification the compensation cost per unit payroll exposure, or the state pure premium provided that the law and payrolls refer to the same state and that \$100 be made the payroll unit. If the basic law be selected to measure the relative loss to society by classifications and if the combined payrolls be chosen to serve as a relative measure of the time exposure then the basic pure premiums have approximately the same relativity as the set of relative numbers assumed at the outset and may be used for weighting the payrolls according to their hazard severity.

This roundabout way of defining compensation differentials

might have been accomplished more directly if the differential had been defined as a comparison of the compensation cost of the specific state with the expected losses developed by the same payroll exposure under the conditions obtained by extending the basic act and the industrial conditions of the basic act to all the states. The longer method was chosen because it was desired to have the original definition which is based on a hazard-weighted payroll exposure free from the differential idea. The later use of the basic pure premium is only as an approximation. The expected losses as used in the shorter method directly involve basic pure premiums which result from a procedure involving the use of differentials.

### *Classification of Differentials*

According to some of the more recent usages compensation differentials may be divided into law differentials and experience differentials.

*Law differential* is the term used to express the relationship of the per unit hazard-weighted payroll cost of two compensation acts insofar as these costs are due to causes which are inherent in the act itself or which arise out of any definite interpretations of the act. The term *theoretical differential* is also applied to the law differential as just defined.

*Experience differential* has been used more recently to express the cost relationship of the experience developed under two compensation acts or under two different periods of the same act.

Each of these two kinds of differentials may be divided again on the basis of including the cost of all accidents covered by the act, or of only certain types of these accidents.

*Flat differential* is the term applied to a differential if the costs of accidents of all parts of the law are included. The terms *single differential* and *general differential* have also been used in the past to refer to the flat differential as here defined.

*Partial differential* is the term applied to a differential which refers to only some of the parts into which the cost of a compensation law may be divided. The partial differential is a differential of analogous parts of two laws. Other terms used for this differential are *differential by parts* and *group differential*. The latter term has more recently been used to refer to the differential—flat or partial—of a group of classifications as distinguished from the differential of all classifications.

*Law Differentials*

In the development of compensation differentials the law differentials, using the term as previously defined, by their very nature preceded experience differentials which had to await the maturing of a state's experience. The law differential came in with the introduction of the compensation basic manual in 1914 and 1915. The varying benefit scales which appeared in the laws of the different states required some index like the differential to express their relative measure.

Stated in a general way the law differential\* is calculated by evaluating the cost of accidents in some typical or standard† distribution in accordance with the scale of benefits in both the act for which the differential is being determined and the act used as standard or basic. It is assumed that the distribution of accidents is developed under equal time exposures in each of the two acts. As the accident distribution and time exposures used in the evaluations are identical they represent equal severity exposures.

The process of evaluation may be represented symbolically by formula 1 where the primed letters refer to the basic state, and the other letters refer to the state whose differential is being determined. The letter *L* refers to losses or costs of accidents in units of weekly wages for the nature of injury indicated in the subscripts: *DC*, fatal; *PT*, permanent total; *MP*, major permanent partial; *PM*, minor permanent partial; *TT*, temporary total; *MC*, medical. The letter *w* refers to average weekly wages, *P* to payroll, *k* to the relative weights used which are the same for both states, and *D* denotes the differential.

$$(1) D = \frac{(L_{DC} + L_{PT} + L_{MP} + L_{PM} + L_{TT} + L_{MC})w \div Pk}{(L'_{DC} + L'_{PT} + L'_{MP} + L'_{PM} + L'_{TT} + L'_{MC})w' \div P'k}$$

$$(1a) = \frac{L_{DC} + L_{PT} + L_{MP} + L_{PM} + L_{TT} + L_{MC}}{L'_{DC} + L'_{PT} + L'_{MP} + L'_{PM} + L'_{TT} + L'_{MC}},$$

$$\text{since } \frac{P}{w} = \frac{P'}{w'} = \text{time exposure.}$$

The types of accidents underlying the *L* terms of a state, in general, are differently affected by the various cost items in the

\*Refer Rubinow, *Proceedings*, Vol. IV, pp. 8-44.

†Refer Rubinow, *Proceedings*, Vol. IV, pp. 19-24. Outwater, *Proceedings*, Vol VII, pp. 57-77.

scale of benefits given in the acts. Any particular accident distribution gives a definite relative weighting to these terms in both numerator and denominator which results in a definite differential. Should another accident distribution be used a new differential would result for the same law. This variation due to the accident distribution used restricts the use which can be made of a flat differential. It is only in a general way representative of the state as a whole and does not generally express the flat differentials for individual classifications. For this reason the flat differential has not been used in converting experience in general rate making since the 1917 Revision.

Partial law differentials are calculated by the same general methods as flat law differentials with the exception that only the losses of the particular type of injury for which the differential is desired, are used. In the following formula for a partial law differential  $L$  refers to the losses of the particular nature of injury covered by the differential. The other characters have the same significance as in the formula 1 for the flat differential.

$$(2) \quad D = \frac{L w \div Pk}{L' w' \div P'k} = \frac{L}{L'}$$

To a smaller degree the partial differential is still dependent on the distribution of the accidents falling within its particular nature of injury. Insofar as the distribution of accidents varies by nature of injury between classifications the partial differential is not truly representative. A larger number of loss divisions according to type of injury would tend to overcome this but it would also necessitate the use of many partial differentials in comparing laws and would materially add to the detailed work in conversion of experience.

There is one factor—the state wage scale—not inherent in the law which since 1917 has been introduced in calculating law differentials. Prior to 1917 the Massachusetts wage distribution was generally used in all states. This action was prompted by necessity as this wage distribution was the only one available at the time.

#### *Experience Differentials*

In the actual operation of a compensation law there are several factors forming no part of the law which affect the cost. The accident frequency, the administration of the compensation



law, the state safety laws and their enforcement, the personnel of the employers and employees, all these with still others are factors which affect the cost of compensation. It is the experience differential which serves to determine the relative cost of the compensation act in actual operation regardless of the source from which any part of the cost may come.

#### *Qualifications Desired in Experience Differentials*

There are several qualifications of different degrees of importance which, if possible, it is desired to have in experience differentials. The value of the method of calculation may be rated according to the degree in which the resulting differentials possess these qualifications.

1. To reproduce experience in the aggregate.
2. To use all experience typical of territory.
3. To form a set of consistent differentials.
4. To be reasonably simple in application.
5. To weight exposure proportionally to hazard.

The first of these is the most important. No differential which would not reasonably reproduce the experience in the aggregate could be given a final qualifying rating. If only two states are concerned the aggregate experience may be exactly reproduced. In a general revision, however, where many states are involved there can only be approximate reproductions of actual experience. Assuming the necessary condition of approximately reproducing experience in the aggregate as applying to each of two methods which are equal otherwise except in the proportion of experience used then the method which makes use of all typical experience of a state is to be preferred.

In addition to the conversion of experience, differentials are used for the general comparison of laws. It is desirable that from a set of differentials on a given basic act the relation of any two of the set may be determined. In order that the results may be consistent the differentials between two states produced by the direct and inverse methods should be reciprocals. The fourth qualification is obvious and the fifth follows from the definition.

#### *Bases of Experience Differentials*

The assumption underlying the use of all compensation differentials is that the partial pure premiums of classifications when

properly subdivided according to nature of injury have approximately a fixed relativity within states and that such variations as do occur are accidental fluctuations due largely to inadequate exposure. If there were ideal states where these assumed conditions were exactly realized then the ratio of the corresponding partial pure premiums of a classification in the two states would be constant and equal to the partial differential. Denoting the differential by  $D$ , the partial pure premium by  $p$ , and using primes to indicate the basic state and subscripts to refer to the classifications, the relation may be stated in the form of an equation.

$$(3) \quad D = \frac{p_1}{p'_1} = \frac{p_2}{p'_2} = \frac{p_3}{p'_3} = \dots = \frac{p_n}{p'_n}$$

or

$$D = \frac{p_1 + p_2 + p_3 + \dots + p_n}{p'_1 + p'_2 + p'_3 + \dots + p'_n}$$

$$(4) \quad D = \frac{\frac{1}{n} (p_1 + p_2 + p_3 + \dots + p_n)}{\frac{1}{n} (p'_1 + p'_2 + p'_3 + \dots + p'_n)}$$

$$(5) \quad D = \frac{1}{n} \left( \frac{p_1}{p'_1} + \frac{p_2}{p'_2} + \frac{p_3}{p'_3} + \dots + \frac{p_n}{p'_n} \right)$$

In the development of compensation differentials many bases for experience differentials have been suggested. A smaller number have been discussed and tested and a still smaller number have been actually used. It is proposed to consider briefly only those which have been used either for general comparison of losses or for conversion purposes in rate revisions. The formulas given may be considered as applying either to flat differentials or partial differentials. In the case of flat differentials the characters should be considered as applying to all the experience and in the case of partial differentials as applying to only the experience under the nature of injury covered by the partial differential.

In the system of symbols used in the formulas the primed characters refer to the basic state, those not primed refer to the state for which the differential is being determined,  $L$  is used to

denote the losses,  $P$  denotes the payrolls,  $p$  denotes state pure premiums, and  $\Sigma$  stands for the summation process.

1. Ratio of Average Values of Accidents.

$$(6) \quad D = \frac{1}{n} \bar{\Sigma}L \div \frac{1}{n'} \Sigma L', \text{ where } n = \text{number injured.}$$

The use of this basis for a differential whether applied to the losses of a single nature of injury or to those of a grouping of two or more of them assumes that the general accident frequency is the same in the two states. It is now generally recognized that at a time when compensation costs and pure premiums are increasing the average cost per injured may be decreasing due to the relatively greater increase in the accident frequency of the less severe accidents.

The use of this method would produce differentials that could hardly be expected to reproduce the losses in the aggregate nor would the experience used be given weight according to the hazard involved. Under this method all the typical experience of a state would be used, its application would be reasonably simple and the differentials produced would form a consistent set.

The use of average values and the number of cases in converting experience is not using an experience differential but rather a modified form of evaluating individual accidents of one state in accordance with the conditions in another state.

2. Ratio of Average State Pure Premiums.

$$(7) \quad D = \frac{\Sigma L_x}{\Sigma P_x} \div \frac{\Sigma L'_x}{\Sigma P'_x}, \text{ where } x \text{ refers to classifications.}$$

On this basis the same relative distribution of industry in the two states is assumed. This generally is not true. This method might serve for determining the differentials between two periods of a particular state if it is known that no change in the general distribution of business has occurred in the interval. Under this method reasonably approximate reproductions of the total experience could hardly be expected in the general case. The experience also would not be weighted in proportion to the hazard. The method is reasonably simple in application, produces a consistent set of differentials and makes use of all the typical experience of the state.

## 3. Ratio of Means of Classification State Pure Premium.

$$(8) \quad D = \frac{1}{n} \Sigma p_x \div \frac{1}{n'} \Sigma p'_x$$

Formula 8 follows directly from the assumption underlying differentials—see formula 4. The formula given is for the arithmetic mean. Each classification is weighted according to its pure premium regardless of the actual volume of exposure. Violent chance fluctuations due to limited exposures are unduly weighted. To overcome this objection the classes used might be restricted to those having large exposures in each of the two states. A variation of this method would consist in taking the mode or median instead of the arithmetic mean.

This method considered with respect to the arithmetic mean of a limited number of classifications would not reproduce the experience in the aggregate, would not weight the experience proportionally to the hazard nor would all the typical experience of the state be used. When restricted to the same classifications the direct and inverse processes would give differentials which are reciprocals and produce a consistent set. In case the pure premiums were already available, the method would be extremely simple in application. Even if these pure premiums had to be determined this method would be considered as qualifying with respect to simplicity in application.

## 4. Mean of Classification State Pure Premium Ratios.

$$(9) \quad D = \frac{1}{n} \Sigma \frac{p_x}{p'_x}$$

Formula 9 also follows directly from the assumption underlying differentials—see formula 5. The formula is again for the arithmetic mean. Under this formula all classification having equal ratios are given equal weight regardless of volume of exposure. The extreme chance fluctuations which are probable in classifications of small exposure have undue influence. This objection might be overcome by restricting the classifications used to those having adequate exposure in each of the two states. The method might also be varied by taking the mode or median of the pure premium ratios in place of the arithmetic mean.

In general the aggregate experience would not be reproduced nor would all experience typical of the state be used. The differ-

entials derived would not form a consistent set and the experience would not be weighted proportionally to the hazard. The only qualification reasonably met would be simplicity in application.

5. Comparison of Expected and Actual Losses.

$$(10) \quad D = \frac{1}{2} \left\{ \frac{\sum P_x p'_x}{\sum L_x} + \frac{\sum L'_x}{\sum P'_x p_x} \right\}$$

In formula 10 the mean of the differentials obtained by using each state's payroll exposure is used. This basis depending on state pure premiums like some of the preceding bases, gives undue influence to chance fluctuations in classifications of small exposure. To avoid these errors classifications of small exposure in either of the states might be omitted.

The differentials produced by this method have been considered as reasonably reproducing the experience and the method might be considered as qualifying regarding simplicity in application. On the modified basis all experience typical of the state would not be used. The differentials derived would not form a consistent set and the weighting would not be proportional to the hazard.

6. Greene's Formula.

$$(11) \quad D = \sum \left( \frac{P_x P'_x}{P_x + P'_x} p_x \right) \div \sum \left( \frac{P_x P'_x}{P_x + P'_x} p'_x \right)$$

Formula 11 is designed to exactly reproduce the losses in the aggregate\* between any two states. As given the formula is in its most general form. Under certain conditions imposed on formula 11 the preceding formulas 2, 3 and 5 become special cases†. This method is a comparison of state pure premiums when they are weighted by a function of the payrolls of both states. It is subject to chance fluctuations occurring in classifications of inadequate exposure.

In its actual use it has been modified and applied to a limited number of representative classifications of adequate exposure in each of the two states. Under these conditions when the work is organized its application becomes simpler than a cursory inspection would indicate. In results this method reasonably

\*Refer Greene, *Proceedings*, Vol. VI, pp. 10-30.

†Refer Mowbray, *Proceedings*, Vol. VI, pp. 260-267.

reproduces the experience in the aggregate and might be considered reasonable as to simplicity in application. In its modified form it would not make use of all experience typical of the state, the direct and inverse process would not produce exact reciprocals and the experience would not be weighted according to hazard.

7. Comparison of State Ratios of Actual Losses to Expected Basic Losses.

$$(12) \quad D = \frac{\sum_1^n \sum_1^{n'} L_x}{\sum_1^n \sum_1^{n'} P_x \pi_x} \div \frac{\sum_1^{n'} \sum_1^n L'_x}{\sum_1^{n'} \sum_1^n P'_x \pi_x}$$

Where  $\pi$  refers to basic pure premium,  $\sum_1^t$  denotes the summation for all classifications ( $t = \text{total}$ ) for policy year,  $\sum_1^n$  denotes the summation of policy years. This is the formula in its most general form. If  $n$  and  $n'$  each become unity the formula refers to one year only and assumes the form **12a** in which it is generally used when applied to a single policy year or to a broad aggregate of experience brought to the basis of a single policy year.

$$(12a) \quad D = \frac{\sum_1^t L_x}{\sum_1^t P_x \pi_x} \div \frac{\sum_1^t L'_x}{\sum_1^t P'_x \pi_x}$$

If in (12) the primes are dropped and the constant factor  $C$  is introduced in the denominators of the fractions in the second member of the equation, and if  $C$  be chosen so that  $C \pi_x$  will be  $R_x$ , the manual rate, and if  $n$  be taken as 3 and  $n'$  as 5 then the expression becomes the experience differential known as the projection factor.

$$(12b) \quad D = \frac{\sum_1^3 \sum_1^5 L_x}{\sum_1^3 \sum_1^5 P_x R_x} \div \frac{\sum_1^5 \sum_1^3 L_x}{\sum_1^5 \sum_1^3 P_x R_x}$$

In this form the formula is a comparison of the three-year and five-year manual rate loss ratios or the present rate level projection factor.

This method weights the classifications relatively to the time exposure times the basic pure premiums which is a constant times the hazard severity. The direct and inverse processes produce differentials which are reciprocals. This produces a system of consistent differentials which have a fixed relationship. The division of the differential of one state by the differential of another state will give the differential of the first state with

## ERRATA

Formulae on page 278, *Proceedings* No. 26, in paper entitled "Remarks on Compensation Differentials" by Paul Dorweiler should read as follows:

$$(12) \quad D = \frac{\Sigma_1^n \Sigma_1^i L_x}{\Sigma_1^n \Sigma_1^i P_x \pi_x} \div \frac{\Sigma_1^{n'} \Sigma_1^{i'} L'_x}{\Sigma_1^{n'} \Sigma_1^{i'} P'_x \pi_x}$$

$$(12a) \quad D = \frac{\Sigma_1^i L_x}{\Sigma_1^i P_x \pi_x} \div \frac{\Sigma_1^{i'} L'_x}{\Sigma_1^{i'} P'_x \pi_x}$$

$$(12b) \quad D = \frac{\Sigma_1^3 \Sigma_1^i L_x}{\Sigma_1^3 \Sigma_1^i P_x R_x} \div \frac{\Sigma_1^5 \Sigma_1^i L_x}{\Sigma_1^5 \Sigma_1^i P_x R_x}$$





reference to the second as the basic state. Thus from a set of differentials based on a given basic state the differentials based on any one of the given states may be produced. All the experience except special state classifications, (a) rated classifications, and unassigned discontinued classifications, all of which have no basic pure premiums, may be used thus making the experience quite representative of the state.

The formula itself would indicate that very much preliminary work is required in order to calculate the set of differentials. This would be the situation if everything in connection with it had to be worked out anew. The present rate revisions have been so organized, however, that much of a preceding rate revision may be salvaged in calculating the differentials to be used in the following. In case it should be desired to calculate partial differentials for parts which are not separately shown in the basic pure premium it would be necessary to work out the new basic pure premiums for the part desired and the work would be very much increased.

#### *Comparison of Law and Experience Differentials*

The law differential calculation requires a very close analysis of the compensation act and its interpretation in each of the many detailed items affecting the cost. The experience calculation requires no knowledge of the compensation act.

The law differential calculation can be made at any time and without hindrance as to the location of the calculator. On this account it may be used to determine the costs of new laws and amendments by anyone without limitations as to place or time. The experience differential can only be made after the experience has fully developed and at such central sources as have available all the experience for the law and for the period desired. It is not adapted to calculations for new laws or amendments nor can it be used by individuals who do not have the experience of the central sources available.

By use of the law differential method the effect of any particular cost item of the law can be determined as *e. g.*, the waiting period or the weekly limits. It is also possible to determine the relative cost for sub-divisions of any nature of injury. The experience differential is of no value to determine the effect of any individual

cost item and can only be used to determine differentials by nature of injury when the experience for this nature of injury is separated in the records.

The law differential can only measure the effect of the scale of benefits and wages. The many other factors entering to an important degree in the final cost of the law cannot be determined. The experience differential does measure the full effect of the cost regardless of its source and this is of greatest importance in general rate revisions.

### *History of Use of Differentials in Rate Revisions*

In presenting in tabular form the compensation differentials used in the general rate revisions, the compensation law used as the basic act, the accident distributions, the wage distributions, and the experience period used for the basic pure premiums, it has been found convenient to divide the time since the introduction of compensation into four periods each corresponding approximately with the time elapsed between the beginning of the preparatory work for two consecutive rate revisions.

#### I. 1917 Revision Period, 1914-1918

Basic Act, 1912 Massachusetts Law

Experience Period, Policy Years 1914 and 1915

Flat law differential based on Standard Accident Table and Massachusetts Wage Distribution was used both in conversion of experience and reversion of pure premiums.

During latter part of this period in the 1918 Pennsylvania Revision these experience differentials were used in conversion for a few states.

- |                        |             |
|------------------------|-------------|
| 1. All other Indemnity | Formula 10. |
| 2. Medical             | Formula 10. |

#### II. 1920 Revision Period, 1918-1921

Basic Act, 1920 New York Law

Experience Period, Policy Years 1916 and 1917

Conversion of Experience

Partial Experience Differentials—A set for each of the three groups into which industry was divided.

1. All Other Indemnity—Based on Greene's Formula
2. Medical—Based on Greene's Formula

Flat Experience Differentials—Used as pure premium conversion factor in few states.

Reversion\* of basic pure premiums.

Partial Experience Differentials—The same as in conversion above.

1. D. & P. T. D.—Based on Average Values. Formula 6
2. All Other—Same as in conversion
3. Medical—Same as in conversion

Partial Law Differentials—American Table and Actual State Wage, used for states having inadequate data.

1. D. & P. T. D.
2. All other
3. Medical

Projection Factor

Flat Experience Differential } Usage Varied in States  
 Partial Experience Differential }

### III. 1923 Revision Period, 1921-1924.

Basic Act, 1920 New York Law

Experience Period, Policy Years 1918-1920

Conversion of Experience

Partial Law Differentials—American Accident Table and Actual State Wage

1. Fatal
2. Permanent Total
3. Major Permanent Partial
4. Minor Permanent Partial
5. Temporary Total

Partial Experience Differentials

1. Medical—Average values and judgment
2. Payroll—Based on comparison of Average Wages

Reversion of basic pure premiums to latest State Law Basis.

Partial Law Differentials

1. Serious
2. Non Serious
3. Medical

Partial Experience Differential—pure premium correction factor for each division

Projection Factor

Flat Experience Differential—Formula 12b

### IV. 1925 Revision Period, Since 1924.

Basic Act, New York Law Effective 1-1-1926

Experience Period, Policy Years 1918-1922

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\*The term "translation" was used in place of "reversion."

## Conversion of Experience

State Policy Year Experience to State Present Law Basis if Amendments Intervene.

Partial Law Differential—American Table, State Wage for Policy Year

1. Fatal
2. Permanent Total
3. Major Permanent Partial
4. Minor Permanent Partial
5. Temporary Total

Partial Experience Differentials—Formula 12a

1. Serious
2. Non Serious
3. Medical

## Reversion of basic pure premium to Present Law Basis

Partial Experience Differentials—Formula 12a—  
Weights given classification experience receiving state credit.

1. Serious
2. Non Serious
3. Medical

Partial Experience Differentials—Correction Factors—  
Formula 12b

## Projection

Flat Experience Differentials—Weighted to apply to indemnity only.

AN EDUCATIONAL PROGRAM IN ECONOMICS FOR  
INSURANCE STUDENTS\*

BY

EDWIN W. KOPF

One of the groups of subjects in the revised 1926 Syllabus of the Society relates to substantive and applied economics. This includes: (a) the principles of economics; (b) insurance investments on a background of monetary science (money, credit and banking); (c) the theory of risk; (d) social insurance, with its foundation in industrial, political and legal history; and (e) economic statistics. The Committee has already organized a study program in two other groups,—law and accounting for the insurance technician, and the present paper is an attempt to suggest an organization of readings in the important division of the insurance sciences which is broadly titled "substantive and applied economics for insurance students."

In considering a study program under the "economics" group the Committee held closely to the certain parts of the definition of the aims of technical education for the insurance manager and the actuary as expressed in the statement of objects set down by the Institute of Actuaries of Great Britain and by the Faculty of Actuaries of Scotland. One of the objects of the Institute was "to investigate all monetary questions involving a consideration of the effects of interest and probability." The Faculty has stated one of its aims to be "the promotion of the study of finance as bearing on the fluctuations in the value of money and of all cognate subjects, a knowledge of which is essential to the efficient discharge of the duties of a life assurance Manager or of an Actuary."

\*Paper number 3, "Outlines of Studies in the Insurance Sciences." (No. 1: "Needs and Prospects of an Educational Program in Insurance Law," by Richard Fondiller, *Proceedings*, Vol. XI, Page 99; No. 2: "Statistics in the Service of Insurance Administration" by E. W. Kopf, *Proceedings*, Vol. XI, Page 102). It is hoped to offer further outlines for the pure and applied mathematics and rate-making groups in further papers to be contributed by members of the Council and of the Educational and the Examination Committees.

It may be helpful to our students and to teachers of insurance, to have a more definitive statement on these disciplines in the Syllabus and to suggest ancillary readings for those of our membership who wish to attain competence in this special group of studies. Insurance, abroad, is often considered to be primarily an important branch of investment banking and its technicians pursue advanced inquiries in economic subjects with distinct benefit to the institution of insurance. In fact, some of the leading minds in investment banking in England and on the Continent are found among actuaries and other insurance officials. I take it that our Society endorses every effort to plan for broad-guage insurance scholarship in so complex a field as casualty and the social insurances and that it supports reasonable effort to provide guidance along right lines for the young people who are at present contemplating an insurance career.

#### I. INTRODUCTORY OR SUBSTANTIVE ECONOMICS

Your Committee recommends sound preparation in substantive economics as a foundation for real competence in the specialized subjects which are of major interest to insurance technicians. Unless properly directed in his introductory readings, the student is likely to be confused in his later studies of applied economics. This preparation and direction aims to reduce confusion on two important points: the *first* difficulty is the seeming subversion of time-tried doctrines; the *second* is inability to discriminate between sound principles on the one hand from unsound application of these principles on the other. As Alfred Marshall points out in his great "Principles of Economics," some of the best work of the present generation appears at first sight to be antagonistic to that of earlier writers, but when discussion has had time to settle down into its proper place, and the rough edges have worn away, no real breach will be found in the continuity of development of the science. The texts chosen for our students show, we believe, that the older doctrines have only been extended, developed or corrected and not subverted.

By all means, the student should avoid the writings of persons who have tried to construct an abstract economics not justified by the facts of history. This includes the writings of those who

build a system of discussion exclusively on imperative ethical precepts or upon special enthusiasms. The aim of these introductory studies should be to develop clear, precise definitions of the essential objects of economic inquiry, and a sense for the logical treatment of economic facts leading to the simpler doctrines which appeal to conscience and common-sense. The student needs to be cautioned against dogma which results from artificial classification, forced definition, and special pleading, suited only to particular classes, at given times and places.

We can expect our candidates to show more than passing acquaintance with essential ideas on constructive competition, the freedom of industry and trade, on enterprise, self-reliance and forethought. A common-sense approach may also be expected toward incentives and motives for economic activity, and toward the fundamental notions of wealth, the production and consumption of utilities, the nature of capital and income, surplus, the transfer and exchange of wealth, the media of exchange, the concepts of price in its various manifestations, profit, value, utility, "costs," and margin.

## II. APPLIED ECONOMICS FOR INSURANCE STUDENTS

It is assumed, first, that within a given field of applied economics the student will endeavor to relate appropriate basic principles to the facts and conditions in the special field. It should be clear to our candidate that there is an essential unity in the different fields of economic inquiry; lacking that, the student may have reason to feel that his effort has been sterile, that the Syllabus has been badly planned, or that the readings have been hastily chosen.

### (a) INSURANCE INVESTMENT AND ITS BACKGROUND

Our first subject in applied economics deals with the principles and practices of insurance investment, with its supporting structure, the theory of money and credit and the history, theory and practice of banking. In dealing with the supporting disciplines of monetary and banking theory the student meets with the second, and to some, an insurmountable difficulty,—the conflict between sound principles and unsound practice. A cool, cautious approach to the study of money and credit is

necessary; and this becomes clear when one recalls that the quantity theory of money has been used to support propaganda for irredeemable paper money and for the national free coinage of silver at a ratio of 16 to 1! Two or three years of study of money and credit may lead our student to a number of time-tried specialized principles.

There cannot be too great emphasis upon sound scholarship in economics among persons expected to discuss professionally the monetary and banking problems which affect sound investment practice and conservative management in the insurance business. From one point of view, insurance is a special form of investment banking, and the insurance technician who would understand his business must be acquainted more or less intimately with the sound principles and sound practices which prevail in the general field of investment banking. It is to the credit of the insurance business that during the past half-century practically none of its officials has ever openly supported any of the systems of monetary logic which were afterward shown to be freakish and impracticable.

#### (b) THE THEORY OF RISK; RISK MITIGATION

Perhaps the most brilliant contribution of pure thought to the insurance business of the future will come from a really worthwhile and rigorous treatment of the theory of risk. This will include a consideration of the several methods of transferring risk—and insurance is only one of them—and of ways and means of mitigating risk. Discussions available to our students are generally unsatisfactory, perhaps because of the fleeting interest of the authors. It would be especially helpful if discussions of risk measurement and the subsequent actuarial treatment of the data, took into account the technique of *a priori* or subjective probabilities as practiced by the actuaries on the Continent of Europe. The meagre text on probabilities which appears in some of our readings on risk and risk-bearing deals altogether with *a posteriori* probabilities applicable only to tremendous and stable masses of cases and not to the relatively small samples of data available to the student of risk or to the insurance pioneer. Perhaps the lack of an observation calculus has been responsible for the retarded development of the theory of risk



and for the lack of pioneering spirit in the transfer of more risks to insurance institutions.

In the preparation of a text on risk suitable for insurance students, much will depend upon the constructive imagination of the author, upon judgment seasoned by years of study of insurance and of other machinery for transferring and mitigating risk, and upon diligence in locating data for further development at the hands of the qualified statistician or actuary. Constructive pioneering will discover new risks for coverage and newer or less expensive modes of cover for risks now being insured.

With the wider application of the insurance principle and of economy in the operation of that principle, there will follow necessarily a discussion of ways and means for mitigating risk. Mr. Whitney\* has already shown that wherever practicable and effective methods can be evolved, prevention follows insurance quite naturally. For one casualty line particularly, four times as much is paid out for preventive activity as is disbursed for losses! Most of the economists who discuss risk in its relation to profit and interest place preventive activity first and insurance or other methods of transferring risk, second.

(c) INDUSTRIAL, POLITICAL AND LEGAL HISTORY; THE THEORY AND PRACTICE OF SOCIAL INSURANCE

Experience has shown that it is undesirable to introduce our students directly to the complex pattern of social insurance theory and practice without some preparation in industrial, political and legal history. The insurance student should be able to view critically and cautiously the plans proposed for covering the risks which are relatively new in the life of the wage-working class of the population. And by "relatively new" we mean since 1700. Before that date the simple handicraft system prevailed, few work accidents occurred and a friendly relation prevailed between master and men. Then came the industrial revolution, the steam engine, long days of labor in attendance upon the machine driven by the steam engine, a division of labor, the introduction of the labor of women and

\*Whitney, Albert W. "Insurance as Conservation and its Relation to the Public Welfare." National Bureau of Casualty and Surety Underwriters, New York, 1925.

children, differentiation between entrepreneur, capitalist and laborer, large-scale production, and horizontal and vertical management and ownership. And bearing upon the later institution of State insurance, there came, as in Germany, a very rapid integration of governmental machinery.

A clear grasp of the principles underlying mass or social insurance and of the institutional forms which such insurances have taken, can be obtained only by viewing clearly the following factors: the change in the status of the laboring classes during the past two centuries, the lack of uniform development of industrial organization, the halting progress of jurisprudence during the latter part of the nineteenth century and the very rapid changes in the mechanism of the public authority. Due reflection on the facts of industrial, political and legal history will suggest that further changes are still to come and that, perhaps, the entrance of the State into mass or social insurance, as in Germany, England and France, was simply a rough experimental attempt to provide large-scale insurance coverage at a time when the factory system was still in a primitive condition and large-scale management was incomplete. At the inception of State insurance only a small part of the workers was employed in relatively large industrial units and even in these establishments the executive element was still actuated by small-time doctrines in management and jurisprudence carried over from the seventeenth and eighteenth centuries. A heavy proportion of the workers was under small employers in unorganized industries or pursuits. It may have seemed desirable, therefor, fifty years ago to secure State action as a temporary, solidifying agency.

At the present time we may expect that under advanced industrial development, under a philosophy of management which is reasonably up to date and under a sociological jurisprudence well beyond the mechanical stage, there may come a revival of positive, private action for the mass coverage of both new and old insecurities and hazards in the lives of wage-workers. It follows, therefor, that the insurance student today should have an adequate idea of the progressive and irreversible changes which have taken place in industrial society,—in working conditions, in management, in jurisprudence and in the forms and application of public authority. He may then be able to weigh care-

fully the facts on the new movement for private initiative and private action in covering some of the more important risks to the security of life, health, income and property.

Systems or mechanical types of mass or social insurance which were suitable, perhaps, for a country in an era of wide contrasts in industrial organization, with exceptional development of public authority, may be unsuited to an ensuing era of practically complete organization of major industries, under a broad social jurisprudence, with differentiated governmental forms. In guiding the student of casualty and social insurance, I should urge, therefore, the development of a substantial foundation in political, industrial and legal history.

#### (c) INSURANCE TAXATION

Acquaintance with prevailing practices in insurance taxation and with the law governing such practices, is assumed under our Syllabus section which deals with insurance law. We ought to urge the study of the principles of taxation and the cultivation of some knowledge of prevailing tax practice of the Federal Government and the States, and perhaps for cities and minor civil divisions. Definitions of taxation must be carefully weighed and an attempt made to differentiate between those insurance "taxes" which in essence are *not* taxes but only charges for specific service rendered to individuals directly benefited, and those taxes which are compulsory levies without a definite *quid pro quod* between taxpayer and the public authority. It may be well for insurance students to keep in touch with current developments in the unification of State tax laws and practice in the publications of the National Tax Association.

#### (d) THE SUBSTANCE AND METHODS OF ECONOMIC STATISTICS

An attempt has been made in our Fellowship Syllabus (Section 14-B) to direct the student's attention toward the available external statistical data of interest and value to the insurance technician. The published Syllabus list leads the student to the chief sources of current data. Much remains to be done, however, in the direction of acquainting the student with the history of current attempts at quantitative analysis of economic data. There is scope for a work similar to Richmond Mayo-Smith's two volumes on Statistics in Economics and Sociology which

would sketch the methods, sources aims and purposes of economic statistics in the United States from Francis A. Walker, through Carroll D. Wright, S. N. D. North and other pioneers, to the contemporary official and private agencies purveying such data. For the United States, there have been systematic data since 1876 (Massachusetts Bureau of Labor Statistics) which were planned to serve what some have called Welfare Economics; again public and private agencies have prepared data which tend to develop a formal pecuniary logic. This latter chain of data sources for the United States goes back to Alexander Hamilton's "First Report on Public Credit." January 9, 1790 and to prior reports of the Colonial Confederation. Within each of these two "Schools" there is endless variety, the result of sub-division and of cross-breeding with related sciences. The insurance student may find in these efforts to determine the characteristics of our contemporary economic life, important leading thoughts which are directly applicable to the insurance business.

The student should learn, however, to discriminate between the several levels of competence in contemporary statistical effort in economics. Some of the "bureaus," "services" and "associations" publish conclusions induced by methods which plainly violate conscience and common-sense; others seemed to be managed by cautious, critical and scholarly men. Our Society's Syllabus (Fellowship Section 14-B) contains impartial references to both types of effort. This will encourage critical reading! The student is cautioned particularly against "forecasters" whose methods and results are palpably grounded upon an uncritical use of statistical methods. Mr. Whitney and Miss Outwater, of this Society, have frankly stated the failure of certain statistical methods in the correlative study of business and insurance operating conditions. The seasoned, disciplined insurance scholar will know the difference between a mechanical projection or graphical device and a reliable forecasting technique when such technique is discovered.

#### FURTHER READINGS IN ECONOMICS FOR INSURANCE STUDENTS

The following advanced readings are submitted for members of the Society who may wish to develop a wider knowledge of certain subjects of fundamental interest to insurance technicians. Before closing I wish to acknowledge the Committee's indebted-

ness to the following gentlemen whose comments enabled me to condense and order this paper: Dr. I. M. Rubinow, Professor Frank A. Fetter; Professors A. H. Mowbray, R. H. Blanchard and W. B. Bailey of this Society; Professor Irving Fisher, Mr. W. W. Greene, Dr. A. W. Whitney, Mr. Richard Fondiller and Dr. I. S. Adlerblum.

### LIST OF READINGS TO SUPPLEMENT 1926 SYLLABUS\*

#### I. INTRODUCTORY OR SUBSTANTIVE ECONOMICS

*Carver, Thomas N.* The distribution of wealth. New York, Macmillan. 1904, \$1.50; *Carver, Thomas N.* Essays in social justice. Cambridge, Mass. Harvard University Press. 1915. 429p. \$2.00; *Clark, John B.* The distribution of wealth. New York, Macmillan. \$3.00; *Clark, John B.* Philosophy of wealth. Boston, Ginn. \$1.00; *Hobson, J. A.* Work and wealth, a human valuation. New York, Macmillan. 1914, 367p. \$2.00; *Macleod, Henry D.* The history of economics. New York, Putnam. 1896; *Marshall, Alfred.* Principles of economics. New York, Macmillan. 1920 (8th edition) 871p. \$6.00; *Seligman, E. R. A.* Principles of economics. 10th ed. rev. New York. Longmans. 1924. 711p. \$3.50; *Walker, Francis A.* Political economy. Briefer course. New York, Holt. 1884. \$1.20.

#### II. INVESTMENTS; MONEY AND BANKING

*Bagehot, Walter.* Lombard Street. London. John Murray. 1924. 348p. \$2.50; *Bullock, C. J.* Essays on the monetary history of the U. S. New York, Macmillan. 1900; *Cassel, Gustav.* Money and foreign exchange after 1914. New York, Macmillan. 1922. 287p. \$2.25; *Dewey, D. R.* Financial history of the U. S. New York. Longmans Green. 1922. 567p; *Fisher, Irving.* The purchasing power of money. New York, Macmillan, 1922, 515p; *Fisher, Irving.* The rate of interest. New York, Macmillan, 1907. \$3.00, *Gilbart, Jas. W.* Principles and practice of banking. 2 Vols. New York, Macmillan. 1904; *Hamilton, Alexander.* Complete works. Edited by Henry Cabot Lodge. New York, Putnam. 9 Vols. (II and III on finance). 1885-1889, *See also* the biographies of *Hamilton* by *Wm. Graham Sumner* and *Henry Cabot Lodge*; *Hawtrey, Ralph G.* Currency and credit. 2nd edition rev. New York, Longmans. 1923, 442p. \$5.00; *Heppburn, A. Barton.* History of coinage and currency in the U. S. (laws, bibliography). New York, Macmillan. 1903 and 1924. 573p; *Jevons, W. Stanley.* Money and the mechanism of exchange. New York, Appleton. 1921, \$2.75; *Johnson, J. F.* Money and currency. Boston, Ginn. 1921, 475p. \$3.00; *Kemmerer, E. W.* Money and credit instruments in their relation to general prices. New York, Holt, 1907, \$1.25; *Lehsfeldt, R. A.* Money. New York, Oxford Press. 1926. 116p. \$1.00; *Magee, J. D.* Materials for the study of banking. New York, Prentice-Hall. 1923, 769p. \$5.00; *National Monetary Commission.* Reports. Senate Document 399, 61st. Congress, 2nd Session. Use of credit instruments in payment in the U. S. 1910; *Noyes, Alexander D.* Forty years of American finance. New York, Putnam. 1925; *Scott, Wm. A.* Money and banking. New York, Holt, 1926, 280p. \$2.75.

\*This list supplements that given in syllabus sections 10, 11, 12 and 14 B of the Fellowship readings. pp. 183-195, *Proceedings*, Casualty Actuarial Society, Nov. 18, 1925.

## III. THE THEORY OF RISK

*Hobson, J. A.* The industrial system. New York, Scribner. 1909, 328p. \$2.00; *Hoffman, Frederick L.* Insurance science and economics. Chapters I and II. New York, Spectator Co. 1911. 366p. \$3.00; *Knight, F. H.* Risk, uncertainty and profit. Boston, Houghton. 1921. 381p. \$3.00; *Macleod, Henry D.* The history of economics. *op. cit.*; *Seligman, E. R. A.* Principles of economics. Chapter 24. *op. cit.*

## IV. INDUSTRIAL, POLITICAL AND LEGAL HISTORY; A FOUNDATION FOR READINGS IN SOCIAL INSURANCE

(a) *Industrial History*

*Barnes, H. E.* Social history of the western world. New York, Appleton. 1921, 126p. \$1.25; *Bogart, E. L.* Economic history of the United States. Rev. ed. New York, Longmans. 1922, 593p. \$2.00; *Bryce, James.* Modern democracies. New ed. 2 vols. New York, Macmillan. 1924, 682p. \$8.00; *Bucher, C.* Industrial evolution, tr. fr. 3rd. Germ. ed. New York, Holt. 1901. \$2.50; *Commons, John R.* The legal foundations of capitalism. New York, Macmillan. 1924, 394p. \$3.00; *Douglas, Paul H. and W. E. Atkins.* The worker in modern economic society. Chicago, Univ. of Chicago Press. 1923, 929p. \$4.50; *Gras, N. S. B.* Introduction to economic history. New York, Harper. 1922, 350p. \$2.25; *Hayes, C. J. H.* A political and social history of modern Europe. Vol. 1, 1916. 582p. \$2.00. Vol. 2 (1815-1924) New rev. ed. New York, Macmillan. 1924, 905p. \$4.00; *Hobson, J. A.* The evolution of modern capitalism. new ed. New York, Scribner. 1917, 488p. \$1.75; *Keir, N.* Manufacturing industries in America. New York, Ronald. 1920, 324p. \$3.00; *Ogburn, W. F.* Social change with respect to culture and original nature. New York, Huebsch. 1922. 365p. \$2.00; *Pigou, A. E.* Economics of welfare. New York, Macmillan. 1925, 783p. \$8.00; *Robinson, James H.* Medieval and modern times. rev. Boston, Ginn. 1919, 790p. \$1.72; *Russell, Bertrand.* The prospects of industrial civilization. New York, Century. 1923, 287p. \$2.00; *Usher, A. P.* Industrial history of England. Boston, Houghton. 1920, 529p. \$5.00; *Webb, Sidney and Beatrice.* Industrial democracy. New York, Longmans. 1920. 899p. \$7.50; *Wright, Carroll D.* Industrial evolution of the United States. New York, Scribner. \$1.25.

(b) *Political and Legal History*

*American Association of Law Schools.* Continental Legal History Series. Vols. I and II. 1912-1918; *Ames, J. B.* Lectures on legal history. Cambridge, Mass. Harvard Univ. Press. 1913, 553p. \$3.00; *Benihem, Jeremy.* Introduction to the principles of morals and legislation. 2nd ed. New York, Oxford Press. 1926. 378p. \$2.50; *Bryce, James.* Studies in history and jurisprudence. 2 Vols. New York, Oxford.

1901. \$3.50; *Carter, J. C.* Law: its origin, growth and function. New York, Putnam. 1907, \$2.50; *Dacey, A. V.* Lectures on the relation between law and public opinion in England during the 19th century. New York, Macmillan. 1914. 506p. \$2.60; *Dunning, W. A.* A history of political theories: recent times. (Edited by C. E. Merriam and H. E. Barnes). New York, Macmillan. 1924, 597p. \$4.00; *Gettell, R. G.* History of political thought. New York, Century. 1924, 511p. \$3.75; *Holcombe, A. N.* Foundations of the modern commonwealth. New York, Harper. 1923, 491p. \$3.00; *Krabbe, H.* The modern idea of the state. New York, Appleton. 1922, 281p. \$4.00; *Laski, H. J.* Studies in the problem of sovereignty. New Haven, Yale Univ. Press. 1917, 297p. \$2.50; *Laski, H. J.* Authority in the modern state. New Haven, Yale Univ. Press. 1919, 398p. \$3.00; *Merriam, C. E.* American political ideas. New York, Macmillan. 1920, 481p. \$2.75; *Pollock, Frederick.* Introduction to the history of the science of politics. New York, Macmillan. 1923. 138p. \$1.25; *Pound, Roscoe.* Interpretations of legal history. New York, Macmillan. 1923, 171p. \$2.25; *Pound, Roscoe.* Preventive justice and social work. *Proc. National Conference of Social Work.* 1923, p. 151; *Pound, Roscoe.* Introduction to the philosophy of law. New Haven, Yale Univ. Press. 1922, 307p. \$2.50; *Vinogradoff, P.* Introduction to historical jurisprudence. New York, Oxford Press. 1923, 173p. \$3.50; *Willoughby, W. W.* Examination of the nature of the state. New York, Macmillan. 1903, \$3.00.

#### V. MANAGEMENT

*Copley, Frank B.* "Frederick W. Taylor," 2 Vols. New York, Harper. 1923, 472p. \$10.00. *Federated American Engineering Societies.* "Report of the Committee on the Elimination of Waste in Industry" New York, MacGraw. 1921, 409p. \$4.00. *Hunt, Edward E.* (editor) Scientific management since Taylor. New York, McGraw. 1924, 263p. \$3.00. *Tead, O. and H. C. Metcalf.* Personnel administration. New York, McGraw. 1920. 538p. \$5.00. *Marshall, Alfred.* Industry and trade, New York, Macmillan. 1919, 875p. \$6.50. *Taylor, Frederick W.* Principles of scientific management. New York, Harper. 1911, \$1.50.

#### VI. TAXATION

*Bastable, C. F.* Public finance. 3rd. ed. New York, Macmillan. \$4.25; *National Tax Association.* Proceedings. The association, A. E. Holcomb, Sec. 195 Broadway, New York City; *Plehn, C. C.* Introduction to public finance. 4th ed. New York, Macmillan. 1920. 446p. \$2.90; *Seligman, E. R. A.* Essays in taxation, 10th ed. rev. New York, Macmillan. 1925, 806p. \$4.00; *Stamp, J. C.* Fundamental principles of taxation in the light of modern developments. New York, Macmillan. 1921, 201p. \$4.00; *United States Bureau of the Census.* Reports on wealth, debt and taxation and on "statistics of states and cities." Govt. Ptg. Office, Washington, D. C. 1900+; *Journal of Accountancy.* Recent editorials and articles on tax practice and accounting.

## INVESTMENTS FOR CASUALTY COMPANIES

BY

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Secretary of the Joint Advisory Committee of Finance of the Royal Insurance Company, The Liverpool & London & Globe Insurance Company and Affiliated Companies.

## 1. UNDERWRITING PROFITS

Underwriting profits are so meagre that the return from the investment of the reserves becomes a question of vital importance. During the past few years it would appear from the published accounts of casualty companies that they have been relying on their investment earnings almost entirely for furnishing stockholders dividends. The news value of this statement is not very great as a similar condition exists in the fire business today. The effect of this condition of affairs on the future policy of insurance companies, however, will probably be far reaching. The progress of those companies who extract an extra 1% on their invested assets will be relatively very much more rapid than that of their competitors. As the business is running today an increase of 1% on invested assets is equivalent to an increase of over 20% dividends.

## 2. THE FUNDAMENTALS OF A GOOD INVESTMENT

The fundamentals of a good investment are commonly assumed to be (a) safety of principal through the lifetime of the security, and (b) regularity of interest income. For the most part casualty company investments are in high grade bonds and in the circumstances it may be apropos to review the elements which enter into the makeup of each type of security.

*U. S. Government Bonds:* These securities naturally head the list, ranking as the premier security of the world today. As to their eligibility for casualty insurance company investments, there can be no question. Approximately 33 $\frac{1}{3}$ % of casualty companies' earning funds are invested in United States government securities. The only debatable point is the amount or relative proportion of assets which should be so invested. They are, of course, readily convertible to cash, are ready collateral

\*This paper presented by invitation of the Committee on Program.



for borrowing, the paper or loans secured against them being eligible for re-discount at the Federal Reserve Bank. Their defect—if one may apply such a term to an obligation of the United States—lies in their freedom from taxation. In the hands of an individual they are free from normal income tax. In the treasury of a corporation and of an insurance company the income derived therefrom is exempt from corporate taxation imposed by the federal government.

The history of casualty business in the last few years has been one of little profit. In these circumstances it would appear that some monetary gain is made by a company transacting a rapidly expanding new business in keeping down its holding of Liberty Bonds to reasonable proportion owing to the fact that the underwriting loss which is caused by the financial strain of setting up reserves may be off-set for taxation purposes against the interest income and it is not until the interest income exceeds the underwriting loss that any benefit is derived from holding tax free securities.

However, the State Departments quite properly insist in deposits being put up in the form of Liberty Loan bonds or other securities of a like grade and this, added to the quick marketability feature, leads one to think that the reasonable sized holding of United States government bonds is a desirable thing.

*State and Municipal Bonds:* State and municipal bonds at the present time loom pretty large in the balance sheets of casualty companies, amounting to 19% of the total invested assets. There are circumstances where, for taxation reasons, a large holding of such bonds is desirable but it would seem that on general grounds it is undesirable for corporations, whether they be insurance companies or not, to hold bonds which carry special features by way of exemption from taxation which apply to individuals as distinct from corporate holders. The point will readily be appreciated if the gross yield of a state or municipal bond in the hands of a very wealthy individual is considered. To a man whose income is in the top bracket of the Federal Income Tax Schedule, a high grade state bond, which nominally yields 4%, in effect gives the same net income as a fully taxable bond yielding over 5%.

I, therefore, would incline to the view that the present holdings

of state and municipal bonds of casualty companies have been and still are on the heavy side and that group of securities will tend to dwindle in importance as years go by.

From the records of the companies with which I am associated it is quite clear that from the standpoint of interest, income, and capital appreciation this class of bond has made a relatively unfavorable showing.

An additional disadvantage is the relatively poor market which this type of security enjoys.

*Railroad Bonds:* From the approximate figures I have compiled it would seem that about 26% of the total investments of casualty companies are invested in railroad bonds. This outlet for insurance companies funds is satisfactory in every way.

The bonds are fully taxable so that the complication of freedom from taxation does not arise. For the most part they are very well secured, being the obligations of the constituent parts of the greatest industry in the world. The underlying bonds are so well protected on most of the prominent systems of the country that it is almost unthinkable that any default can ever take place. This type of security is readily saleable and provided that reasonable care is exercised in their selection I can see no reason why they should not continue to show satisfactory results.

This is a short summary of their merits. As to the disadvantages, I think there is only one. They are a favorite medium of investment for the mammoth life insurance companies in the United States. As you doubtless know, the life insurance companies are more closely restricted as to the character of their investments than is the case with casualty or fire insurance companies. For example:

In many states life insurance companies are precluded from buying preferred or common stocks. In some states they are precluded from buying bonds which are not specifically secured on property. In other words, general obligations and unsecured charges like debentures are not admissible. This legislation, coupled with the phenomenal rise during the past few years in new life insurance business transacted, has resulted in an unprecedented demand for high grade railroad bonds and obligations of like security. So great has been this demand that in

many issues there is evidence of scarcity value, if one may use the term, arising, and consequently, owing to this concentrated buying the market has been marked up when contrasted with industrial bonds of like character. I have been so impressed during the past few years with the persistent accumulation of securities of this type that I took the pains to investigate the position of one or two of the prominent issues. I think it can be safely said that at least one-third of the outstanding amounts are already in the treasuries of insurance companies, savings banks and similar institutions. Furthermore, it would seem that there is very little likelihood of any considerable amount of bonds so held coming into the market. In these circumstances, provided that money remains reasonably easy and that no disturbing factor of major importance arises, such as a world war, there would seem to be an improving market ahead for this type of bond. The importance of the life insurance companies in the investment market today cannot be too strongly stressed.

*Public Utility Bonds:* At the present time about 7% of the invested assets of the companies are in this type of security. Speaking generally, they yield a little more than railroad bonds of the same class, due to the fact that the current supply happens to be larger. This condition, however, is probably a temporary one which will disappear in the course of the next few years, as life insurance companies are being forced to buy them in increasing quantities.

As to their fundamental security—they have not the background of proved earning power that the underlying railroad bonds have. On the other hand, the corporations whose obligations they are, are so inextricably intertwined with the economic life of the United States that it is improbable there will be any question of default on senior issues.

The public utility bond of today is a more modern financing instrument than the old type of railroad bond. Latitude has been allowed for future corporate needs by leaving many of the mortgages open in the sense that further issues of bonds can be made, a limit being generally imposed such as that the additional issue is not to exceed 75% of the cost of any improvements made.

It would seem that the electric light, power, telephone, and similar industries are not quite on such a fundamentally stable

basis as is the railroad industry. The future would seem to hold more possibility for change but in spite of that I would rate highly the obligations of the leading public utility companies in this country today and would predict a rosy future for them.

*Real Estate:* I suppose I must subscribe to the orthodox view that real estate should only be owned by casualty companies in so far as the need of the business demands. There would seem to be no objection to companies owning their own offices and also sub-letting sufficient space in the building which houses their offices to allow for reasonable expansion. Beyond this I would not be prepared to go. Casualty companies appear to hold a relatively insignificant amount of real estate.

*Mortgages:* There is no reason why a moderate amount of these investments should not be held. Properly selected they yield a steady income and suffer no depreciation. On the other hand all possibility of profit is eliminated as generally the obligations run for relatively short periods. The placing of money on mortgage, however, is a highly technical business and calls for considerable judgment and knowledge of values. In the case of a life insurance company with several hundreds of millions of dollars assets, it is not uncommon to see a highly skilled mortgage department functioning with profit to the company; the overhead of the department being negligible when distributed over the relatively large amounts advanced. The casualty companies, however, have not the gigantic assets of the life insurance companies today and, consequently, I would be disposed to counsel concentration on localities where values are well known than the diffusion of efforts over a larger territory with consequent lack of specialized information.

*Stocks:* The subject of stocks logically divides itself into three headings—guaranteed stocks, preferred stocks, and common stocks. A moderate amount of the first two is not uncommon but personally I think there is little in their favor. Their position in the financial structure of a company is between the upper and the nether millstones. If things go well they get their regular dividend, if things go badly they are unsecured and not infrequently fare no better than common stocks.

Common stocks, themselves, on the other hand, are, I think, entitled to serious consideration. This statement probably

invites severe criticism. My opinion, however, is the deliberate outcome of five years of study of conditions in the security market and I am satisfied that with proper management very advantageous showing can be made by investments in sound common stocks. Selection of the proper channels calls for qualities that differ perhaps from those which are needed in analysing Bonds and fixed interest bearing obligations.

Here it is necessary rather to observe the future trend of an industry rather than to examine its history. Above all, however, the risks attendant upon such investments must not be overlooked. They are the last line in the capital structure and in bad times are apt to suffer severely. I sometimes feel that there is something illogical in casualty companies assuming the large contingent risks they do in their bonding business and at the same time pursuing an ultra-conservative course in their investment operations. I am satisfied that given sound management and, of course, that is a condition precedent to the success of any business, a greater measure of profit can be obtained for stockholders by buying into sound properties than by guaranteeing the performance of certain obligations, which is frequently done in the course of their daily business. On the other hand, the steady and persistent accumulation of the bonds of the life insurance companies will, I am sure, force the fire and casualty companies to seek an outlet for their funds in channels not open to their life insurance company competitors in the security market. Today the casualty companies have about 10% of their assets invested in common stocks.

### 3. DIFFERENCES BETWEEN THE REQUIREMENTS OF LIFE, FIRE, AND CASUALTY COMPANIES IN THE MATTER OF INVESTMENTS

A few words on the fundamental differences in the needs of the various insurance companies may not be out of place.

Life companies are primarily concerned with unquestioned security and yield. For the most part their bonds are held to maturity. I suppose there is an attempt made to make the average unexpired term of their bonds coincide with the average duration of the life insurance contracts on their books. There is no such need in the fire and casualty business.

In the case of fire companies the question of liquidity of their assets should always be borne in mind. They should be so

equipped in the financial sense that some sudden conflagration will not catch them flat footed. I suppose 50% of the assets of the first line fire insurance companies are readily saleable.

Casualty companies are not hampered, it seems, in any way. They should seek the high investment list always maintaining an eye on increasing their yield.

#### 4. DISTRIBUTION BY MATURITY

It is generally considered prudent to arrange for maturities to conform to some reasonable scheme. I suppose the average company will find the unexpired term on its bonds to run in the neighborhood of 20 to 25 years, depending largely upon the amount of government issues held. It would be generally considered good practice always to have 15% of the invested assets falling due within the next 5 years. This factor, however, can be unduly stressed in the case of casualty companies and I would feel perfectly safe in urging a company to extend its average maturity when the bond market looked good. Conversely, I think profit, or rather saving in depreciation, would result if the mean maturity were shortened when it appeared that a decline in fixed yielding securities was imminent. Of course, here again the requirements of life and fire companies differ among themselves and again differ from those of casualty companies.

#### 5. FUNDAMENTAL INVESTMENT POLICY

Most casualty companies in the United States appear to have followed a reasonably conservative investment policy seeking the highest grade of securities inclining rather to be ultra-conservative, I would say. They have avoided more speculative bonds with their inducement of a higher interest yield. In spite of that fact, however, they have all enjoyed great benefit from the upswing in the bond market which has occurred since the year 1920. To achieve anything like the same results during the next 5 years is probably going to be much more difficult and if underwriting profit remains meagre and money remains easy I would not be surprised to see the more conservative companies investing increasing amounts in securities which might be expected to show capital appreciation due to increased earning power of the properties.

As the magnitude of the invested funds grows I think you will find that an increasing amount of specialized attention will be devoted to the investment end of the business. Companies will become large enough to justify the constant attention of one man to this end of their corporate operations. If this diagnosis of the trend is correct we might reasonably expect to see the companies loom largely in the day to day trade in investment securities in Wall Street.

New York City banks add considerably to the profits they derive from loaning money for commercial needs by buying and selling investment securities. There is no reason why insurance companies should not follow that lead. If a bank with its deposit liability is justified in trading in securities then surely a casualty insurance company is, as there is no possibility of an immediate call for funds.

## IN CONCLUSION

### 6. PRESENT OUTLOOK IN SECURITY MARKET

I suppose this rough statement would not be complete without some reference to the present outlook in the security markets today, with special reference to investment of casualty companies' funds. The outstanding financial operation in the next two years will unquestionably be the refunding of the 3rd Liberty Loan. Mr. Mellon on a rising market has handled the operation to date in a masterful manner. On three occasions he has succeeded in advancing the maturity date so far ahead that for all practical purposes the operations have postponed any further worry indefinitely. There still remains, however, over two billion dollars of 3rd Liberty Loans to be dealt with and it would seem that there is a likelihood of the next refunding operation being done on a  $3\frac{3}{4}\%$  basis.

The operation of the United States Treasury Sinking Fund has been so extensive that we shall soon be contemplating serious reductions in outstanding amounts of Liberty Loan issues. This, again, is an additional feature tending to force insurance companies into wider fields for their investments. The outlook for money seems to indicate a plentiful supply. All these factors augur higher bond prices. The only force which can militate

against that trend, it seems, is that which would be set into motion in the event of the United States extending the resources of her money market and investment market on a very much more extensive scale to foreign nations. What the future holds during the next five years in this regard is very largely a matter of conjecture.

Today the ability of the United States to produce wealth both from the farm and the factory is unprecedented and there are very good reasons why the industrial plant particularly should be run as near to capacity as possible. This indicates a distinct probability of fixed capital piling up in increasing quantities in the near future. So far as the outlets for this capital are concerned it seems that the geographic position of this country, its political and economic history, do not augur an easy transition to a position where the United States becomes a great lender nation as Great Britain became in the latter half of the 19th century.

The average American investor does not take kindly to foreign securities. Contrast that position with the condition we find in the investment market in London. There is the same background of individuals buying high grade investment issues such as the War Loans in London and the Liberty Loans in the United States. There is, however, one great difference. Life insurance is a much more potent factor in the economic life of the United States than is the case in Great Britain. The average Britisher invests his savings himself; the average American has a considerable portion of his savings invested for him by the large life insurance companies. This condition, I have little doubt, leads to a strong disinclination on the part of the average American investor to embark on the uncharted sea of foreign investment.

Viewing the sum total of these factors I incline to the view that high grade security prices will move to higher levels. They in turn will induce preferred stocks to follow them and finally the common stocks of corporations of proved earning power and established position will be affected by the overflow of investment funds. This, it seems to me, is the trend of the tide. The situation may change, however, and change with the rapidity of a kaleidoscope. Only constant vigilance will enable one to discern when the turn arrives.



THE FUNCTION AND FUTURE OF INDUSTRIAL  
RETIREMENT PLANS

BY

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Industrial retirement plans, as a practical solution of the problem of superannuated employees, have become a subject of general interest and importance in this country. Because of its nature, the problem is of particular interest to the members of the Casualty Actuarial Society and I fully appreciate the honor afforded me by this opportunity to discuss it. My remarks will be concerned primarily with the social and economic aspects of the subject, rather than with the strictly actuarial or technical phase, and in conformity with the current fashion in social and economic fields, I shall take the liberty to forecast the trend of the future development of retirement plans in this country.

The health, happiness, and even subsistence of an individual in the normal civilized community of the present time are dependent primarily upon a continuing income of money. For most the source of this income is salary, wages, or other compensation derived from employment. Consequently, anything which will cause the discontinuance of employment—and hence the income therefrom—has been aptly described as a specter hovering over the individual. The five main specters are well known—they are death, accident, sickness, old age and industrial depression.

These contingencies and the problems connected with them are being increasingly studied and discussed each year, and this discussion has not, by any means, been confined to one class. Organizations, committees, and commissions of all types and classes have attacked the problems. They range from comprehensive units such as the International Labor Bureau at Geneva, which has a program mapped out for years in advance, to a committee investigating some phase of one of the problems for a small employer or his employees. Sometimes constructive work

\*This paper presented by invitation of the Committee on Program.

is done, while other times the results are not worth the labor expended.

When one realizes the increasing interest in these various problems, the natural question is "Why?" The answer is too well known to warrant more than a short reference. In the economic evolution of the world, we are now in an industrial era. Formerly, the business unit was very small. The "prominent citizen" owned his own business. The corner grocery had not become a "chain store"; the milkman was a farmer, and not an employee. Individuals owned their own homes and did not have to pay rent. Transportation was not as available as now, and people lived longer in one community and there were closer ties among the neighbors. Now vast numbers are solely employees—and this includes many managers of industry. The business unit has become a very large one, and corporations with the number of employees running to five or six figures are not uncommon.

As a result of these and many similar changes in the economic system, the income of the individual is now more liable to be cut off entirely, or at least to be reduced more rapidly, when disability, death, old age, or unemployment occurs. Formerly, the occurrence of such contingencies would not have had such a marked or immediate effect, because some form of a reserve had been more or less unconsciously built up. The reserve might have been cash, merchandise, or the "good-will" of a business, but because the business unit was small, this reserve was available to the individual. Frequently it was not realized that such a reserve against the specters existed, but whether the reserve was the good-will of a shop from which the profits would continue to go to the unfortunate victim, or cash in a bank, the effect on the continuation of income was the same.

It is the increasing abruptness with which income is now stopped through no fault of the individual that has made the problem arising from the five specters a matter of general concern, and has stimulated the search for remedies. As might be expected, the solutions offered take many different forms.

At one extreme, we have the man who believes in the continuance of the old order, which has proven satisfactory for so many years—or centuries. Protection against the contingencies we are discussing is solely a matter for the individual. Responsi-

bility and initiative must rest with each one separately, if we are not to destroy the spirit of thrift, ruin industry, disrupt the institution of the family, cause demoralization, raise or lower the interest rate, etc.

At the other extreme, we have the man who will simply remove all five specters by a comprehensive program of compulsory state insurance. Such a program insuring everyone against the five "dreads" confronting all workers was suggested in 1924 by a member of the British Parliament and it was claimed that:

The . . . . . Scheme would immediately relieve and solve the awful abnormal unemployment problem by giving the weary, tired, wornout workers over 63 the offer of a Pension to enjoy at once and for life in some ease and comfort.

. . . . . the pensioning of the weary, aged worker, the younger worker given full scope and just reward for his labour and skill, all these should mean a quickening right through the ranks of industry giving largest promise of reward to the toiler, success to trade and industry, and added strength, prosperity, and greatness to the State.

The 1921 Census gives the total number of widows as 1,824,323. It is reasonable to expect that, owing to mental relief to men workers through an adequate pension system at 63, there will be a decreasing number of widows.

Under the . . . . . Scheme, 1,000,000 workers retire at once on pension and the Unemployment Problem is solved.

Fortunately or unfortunately, it seems that neither of these two alternatives offers the best solution for the problems in this country. The reasons as to the particular problems of old age will be discussed later and are indicative of the general objections to the alternative plans. However, as they represent the two extreme viewpoints, we may anticipate that the best solution will lie between them and we should, therefore, ascertain the underlying premise of each. For the first, it is that the only satisfactory solution is individual prevention; the second, relief through a state insurance scheme.

These two premises suggest immediately a difference in the attitude of Europe and this country towards insurance. The difference is by no means as great as that between the two premises, but it is indicative of the character of the solution which may result in this country as contrasted with that in Europe.

It is frequently stated that the function of insurance, another

name for protection against contingencies, is, first, to prevent the occurrence of the contingency insured against, and secondly, to indemnify on account of the loss when it does occur. In this country, it is the function of prevention that is strongly emphasized and it is maintained that every effort should be made to accomplish it. In Europe, the second function—that of relief—is stressed primarily, although it must be admitted that mention of prevention will be found in European publications, and even in the government insurance laws. However, the real emphasis on prevention, which is that of practical attempts to make progress, is much stronger in this country. We find it in life, fire, casualty, and other branches of insurance. Companies boast, not only of how much they paid in claims, but even more of the amount of claims prevented or postponed. One company even publishes annually a “financial” and a “health” statement giving its experience for the years in terms of lives saved as well as the dollars and cents received or disbursed. On the other hand, we have the example of the British Unemployment Insurance Act which offers practically no encouragement to an employer to reduce unemployment. Indeed, as a concession to the advocates of the “prevention” policy, there is a provision which is supposed to give this encouragement, but it is too weak and indirect to be successful. It takes more than a statement and a provision to be of value; constant vigilance and constructive efforts are required and the person who can do the “preventing” must find it to his direct advantage to do so.

In this country, the doctrine of prevention has many enthusiastic disciples in practically every branch of insurance. Whether or not there is merit in the general doctrine is of little moment here, except to state that there has begun recently a movement by some employers which offers a preventive solution of the problem of the superannuated employee. Present indications justify the hope that the use of this method will spread and that it will have very beneficial results. Probably none of these employers are aware that this method may be regarded as preventive in effect, but, nevertheless, it may be so regarded.

Upon mentioning a preventive solution for the aged worker, you register a protest and state that efforts are being constantly made in this country to reduce death, accident, sickness and

unemployment. If they are at all successful, you may say that it would result, directly or indirectly, in the increase in the number attaining old age and so it would appear that any suggestion of a preventive measure for old age itself would be absurd. And so it would be, if old age itself were the specter that haunts the workingman, and not the loss of income due to inability to retain employment. But the problem is to prevent, not old age, but loss of income during that period. It is in this respect that a preventive solution for the loss of income in old age differs so materially from the treatment of the other contingencies—for, in the case of death, disability, or unemployment, we can offset the loss of income by actually preventing or at least postponing the occurrence of the contingency.

That the entire problem of the aged cannot be solved by the "preventive" method is readily granted, so that it seems advisable, before discussing it, to make a brief analysis of the problem, and in this way ascertain to what extent this solution may be employed.

Old people may be grouped in three general classes. Those whose incomes continue either because of investments, or ability to work, form one class. Obviously, they offer no great problem and may be disregarded in our discussion. The second group would include those individuals who have no income because of "indolence, lack of moral fiber, inadequate mental or physical equipment, lack of judgment, adverse fortune, etc." Their condition might better be described as "absence of income" than as "loss of income." The third class includes the workmen who, because of superannuation, become inefficient in their work and consequently lose their productive ability and earning power. Just as with inanimate machinery, human machinery deteriorates and, after a certain point, should be replaced, if the maximum production efficiency is to be maintained.

Considerable confusion in the discussion of superannuation often has arisen because of bulking the last two classes together. The second group, which might be called "social," has always existed, and is in main a problem of society in general. This group includes the unfortunates of society who produce little wealth which can be accumulated for their old age. Provision must be made for them from the funds of the community as a matter of relief. Whether or not the present methods of caring

for them are satisfactory is another question, and a very interesting one, but any attempt to study it together with the problems of the other two groups would only invite confusion.

The third group, which might be called "industrial," is in main a product of the present organization of industry, and its problems should be approached with that fact in mind. Before the era of factories and corporations, many in that group would have had an income in old age because of an actual saving of wealth from the productive years for use in the non-productive years, whether the wealth were merchandise, property, or even the "good-will" of a shop, and therefore they presented no problem.

Fortunately, the recent tendency in this country has been to study superannuation separately for the three groups. The first group whose income continues offers little difficulty. For the social group, any solution must be based on the principle of relief, so that for it the problem is a matter of improvement in method—not the method itself. The industrial group includes the largest number of individuals and there is no general agreement as yet as to the most satisfactory method for it. Obviously, the last group presents the most important problem, and it so happens that a preventive solution may be applied to it. For these two reasons my remarks will be confined to the possible solutions for this group.

A practical solution for any social problem must take into consideration the existence of certain facts and conditions, which may or may not be justified. Whether or not the ideal solution would be for the individual to make his own provision for old age is of little importance, because the fact remains that many individuals do not or cannot make such provision, and consequently individual prevention does not offer a practical solution.

A solution sometimes suggested is a universal state pension scheme with no "means" restriction, and financed jointly by the state, employer, and employees. There are many serious obstacles to such a program in this country. Various legal difficulties would be encountered and programs of this nature are always opposed by vested interests of one sort or another. These vested interests are by no means restricted to capital but may also be labor organizations, farmers, etc. An inherent

opposition to this solution, based considerably on sentiment, exists on the ground that it should be avoided because of its paternalism or other "isms." For these reasons, it would be very difficult to get such a proposal adopted, and, after all, if a program cannot be readily adopted it has not much practical value.

Even if such a program could be enacted, conditions in this country are very unfavorable for any universal scheme as there is no uniform standard of living conditions in the various localities and industries. For one section or occupation, \$50 a month might be an adequate pension while in another it would be altogether insufficient. The labor conditions, age and occupational distributions, financial and political status, and other considerations as found in the different states would cause considerable difficulty. In addition, any scheme for a state pension fund would probably require the state to take care of the accrued liability, which would necessitate a heavy tax on the State Treasury for some time to come.

Public and private opinion concerning social problems is to a considerable extent a matter of sentiment, rather than reason, and this situation must be borne in mind in seeking a workable solution. Consequently, we must take cognizance of a strong undercurrent of feeling which seems to exist in this country that a social problem which is a product of industry should first be attacked by industry independent of state direction, so that, by its own initiative, a solution may be found. Only after industry has had a thorough opportunity and failed to find a satisfactory solution, should the state intervene and compel the adoption of certain remedies. Whether or not the existence of such a feeling is logical or desirable does not matter in devising a solution, for its existence must be taken into consideration if the solution be one which can be readily made effective.

It is true that industry has not always solved its social problems and that in some instances state intervention has been necessary, an illustration of which is the various "Workmen's Compensation Insurance Laws." Furthermore, while it is my belief that state universal pensions are by no means a satisfactory solution for this country, I would venture the prophecy that if industry itself does not solve the problem, some form of a state compulsory pension scheme will eventually be adopted.

However, the present indications would seem to justify an attitude of optimism concerning the probability of a satisfactory solution by industry of its problem of superannuation. We have in the astounding growth of Group Life and Health Insurance in the last few years, examples of the progress industry has made in solving some of its problems of a social nature.

Industry is really studying superannuation at present and is trying to find the best method to make provision for it. Some of the methods being tried are profit sharing schemes, savings funds, stock ownership, insurance company policies and contracts, and pension schemes and funds of various types. Of these, the most general and direct method is the establishment of a formal or informal retirement plan, either self-administered or administered through insurance company contracts. The reason is quite obvious—a retirement plan provides a pension or annuity, which is an income, and therefore, the exact provision required for old age. Stock ownership and savings fund schemes usually have other purposes in addition to the provision of an old age income and are at best only indirect solutions. In fact, many corporations which have such schemes also have retirement plans.

Employers are understanding more and more that there is only one primary reason for a retirement plan, and perhaps, because of the cost, it may be called the sole justification. It is the cold business reason of necessity. Formerly the reasons assigned were reward for service, gratuity, improvement in morale, reduction of turnover, disciplinary use, etc. Today employers are realizing that they must pay pensions—whether on an active payroll or a pension roll—to the employees who have begun to slip because of age. Competition necessitates constant improvement in production efficiency and therefore the inefficient because of old age, whether man or machinery, must be replaced. To discharge such employees outright would be a very unwise policy and the result is that a pension is paid in form of an allowance, annuity, or wages. The most costly method is the one under which the employee is kept on the active payroll and a pension paid to him in the guise of salary. This has been demonstrated by tests made by employers which proved that money would be saved by retiring employees and removing them from active service.

It is advantageous that the employer regard the problem as a



business one, and not as one of altruism, charity, or reward. When the employer realizes that he must pay pensions, his business training impels him to find a plan which will, in addition, secure as many by-products, as it can, such as reduction in turnover, improvement in morale, etc. He will seek a plan which is systematic and definite and sound, and which assesses the cost to the time and place in which it was incurred. It may also be that the fact that the managers of industry are frequently employees themselves, introduces a selfish element which serves very advantageously by making the manager desire a plan applicable to all employees, including himself, which is sound in principle and finance.

Many employers are now finding and adopting plans of this nature, which become immediately preventive in effect. Of course, they do not prevent old age, for they are not based upon a policy of the extinction of human life after a certain age, a "remedy" which was widely discussed some years ago as a result of the distortion of a public remark of Doctor Osler. The preventive effect is a result of the assessment of cost during the working years. Funds are laid aside and accumulated for each employee during his productive years to provide an income during his unproductive years. Consequently the method is simply an accumulation of income which thereby prevents the loss of income. Contributions of one employee are not used to pay pension to another employee, but part of the revenue resulting from the production of each employee is set aside for that individual employee. In effect it is comparable to a grocer who builds up a reserve in merchandise and equipment which can be used as a source of income in old age.

The type of industrial plan which will be adopted in the future as a result of the study of superannuation as a business problem will be considerably different from most of those in existence to-day. This difference will come primarily from a change in the financing of the plan. Most existing plans are on a "cash disbursement" basis, or a modification thereof, which means that pensions are charged when paid as a current operating expense. Money is to-day being declared as dividends or used for other purposes which should be used to set up a reserve out of which to pay the heavy pension costs of the future. The continuation of this practice might easily prove embarrassing to the employer.

However, employers are now learning that the financial provisions for pensions should be made while active service is being rendered; that sound corporate finance requires that at any time reserves should be on hand sufficient for all future pension payments arising out of service up to that time. When this method of financing is adopted, the retirement plan immediately becomes a preventive one, for neither the employer nor the community will have to relieve from current earnings the loss of income by a retired employee.

When a reserve basis is decided upon, other modifications and changes often take place in order to simplify the basis or permit a fairly accurate reserve to be calculated. The abandonment of plants by several large employers is teaching others that, before a decision is reached, their study should include not only that phase which might come under the head of social philosophy but also the actuarial and financial phases.

A retirement plan requires money. A good one requires considerable sums. Unfortunately, this fact has been not generally recognized and, after an employer begins his study, he becomes frightened by the experiences of some of the older plans. The difficult task today is to reassure the employer and convince him that there is available a solution which will come within his means. "History repeats itself" is a very trite saying, but it certainly does seem that industrial retirement plans are passing through the same stages that life insurance did in its development from the haphazard and unscientific financial basis of the old assessment and fraternal societies to the mathematically determined basis of legal reserve insurance.

Based upon observation of the type of plans now being adopted and upon the trend of thought among our more progressive employers, I feel that retirement plans will so develop that, at some time in the future, industry will have plans in effect which will include the principal characteristics regarded as ideal by many students of the subject. This forecast is further based upon a belief that the interests of employer, employee, and society are not opposed to each other and that a plan which is sound in social, financial, and actuarial principles will be the most satisfactory for each of the three parties concerned. Fortunately for the development of sound retirement plans, there is an increasing realization on the part of the employer that the

interests of the employee are his interests, and likewise on the part of the employee that the interests of the employer are his interests, which change of sentiment is reflected almost daily by additional evidence of various kinds.

To be specific, my forecast is that at some time in the future the problem of superannuation in the industrial group will be solved to a large extent through retirement plans adopted by individual employers and that these retirement plans will have certain characteristics which are:

1. Benefits related to earnings and length of service.
2. Liabilities provided for as they accrue.
3. Cost borne jointly by the employer and the employee.
4. Contractual relationship.
5. Favorable policy towards migration.
6. Supervision by State Insurance Departments.

As these characteristics are rather broadly stated, some discussion of them may be appropriate.

Many employers and other students of retirement plans are becoming convinced that a plan, to be fully effective, should provide substantial retirement benefits which in some measure are in accord with the standard of living to which the employee has been accustomed. A nine hundred dollar annual pension may be quite adequate for a twelve hundred dollar a year man and altogether inadequate for a ten thousand dollar a year man. Moreover, if the benefit be too small, there will be a tendency to retain the employee in active service and this would defeat the very purpose of the plan.

The relationship of the retirement benefit to earnings need not be a definite percentage of salary. As a matter of economy in administration, the use of salary classes is very desirable and should increase. Under such a plan, employees are grouped in certain classes determined by salary. For example, one class might include all earning under \$100 per month; another group for those earning between \$100 and \$150 per month; etc. A small number of classes, from four to ten, would be sufficient for the ordinary concern. The retirement benefit would be dependent upon the salary class, so that the group earning under \$100 might receive an annuity of \$1 per month for each year of service; the second group \$1.50 per month; etc. The annuity will thereby

be determined by earnings, a desirable feature, but the calculations caused by using a percentage of the exact salary for each employee will be greatly reduced, which is also highly desirable.

The practice of basing the retirement annuity upon a function of final salary, whether this be assumed to be average earnings of the last one, five, or ten years, will decline, for an estimate of the salary many years hence is at best an "educated guess" and it is impossible to definitely determine, and therefore provide for, the liabilities as they accrue. The use of the total salary received during the entire service as the basis of retirement benefit will become more general since this does not require any estimate of future salaries and thereby removes one very uncertain factor from the calculation of the liabilities.

Another type of plan which will be adopted is the "money purchase" method, under which a certain percentage of salary, or an approximation thereof, is set aside each year and accumulated at interest until retirement, at which time an annuity is purchased by the fund in hand. Obviously, as the annual deposit is a function of salary, the retirement annuity will be related to earnings.

The wisdom of the practice of providing for the liabilities of a retirement plan as they accrue is being steadily recognized. Practically every investigation includes in its findings a recommendation that the plan be financed on the reserve basis. Employers are realizing that correct corporate accounting and finance should assess the cost of an employee's retirement income as an operating expense during his active service, for it is on account of that service that the income is payable.

Sound business practice has made it almost mandatory to charge off depreciation for buildings, equipment, and other capital assets while in active use and to build up a sinking fund for their replacement. This practice simply provides the funds for the replacement liabilities as they accrue, and not as they mature. This method was not always in effect, but required considerable time, patience, and educational work to accomplish its adoption. In like manner, the soundness of a similar practice for the replacement of the superannuated is becoming more generally admitted and, in time, will be in general use. Moreover, I believe that as this reserve principle is recognized, employers will insist on plans, the benefits of which are such that liabili-

ties for them may be definitely determined and so not depend upon the course of such changeable rates as salaries and withdrawals, as those of many present plans do.

In a study published in 1925 by the National Industrial Conference Board, 248 different retirement plans conducted by 245 different firms were analyzed. Of these, less than 12 per cent. are contributory. That is the situation at present. As to the future, I believe the percentage of the new retirement plans which will be on a contributory basis will be much greater than 12 per cent.

Many advantages favor a contributory plan. It will either reduce the cost to the employer, or allow payment of larger benefits. The taint of paternalism or charity is removed and the habit of thrift and savings is encouraged. Employees value more something for which they must make some payment, and another opportunity is afforded for an increase in cooperation and mutual good-will between the employer and the employees.

The adoption of a contributory plan will encourage making the plan contractual, and thereby make moral obligations legal obligations. Probably one of the main reasons why most present plans are non-contributory and non-contractual is that the employer desired to have full control over the plan so that if, on account of the increase in eventual cost of which he had no conception or for any other reason, he thought it desirable to modify or cancel the plan, he could do so easily. Naturally, then, the employer did not wish to include any obligations arising out of the contributory feature. While this reason as to possible increase in cost may have been important in the past, it has little value now, since plans may be, and are being, devised for which the employer need have no fear as to eventual cost. There need be no such fear when the plan is underwritten by an insurance company, and as a result, considerably more than half of the plans underwritten recently by one insurance company permit the employees to contribute. A few years ago practically all Group Life Insurance was purchased at the sole expense of the employer, while now about 95 per cent. of the Group Insurance written is paid for jointly by the employer and the employees.

Of the 248 retirement plans referred to previously, about 3 per cent. are fully contractual and about 24 per cent. contractual to a limited degree. The remaining plans clearly avoid any

legal liability to pay pensions, or even to continue them if once begun. As stated previously, the reason for this situation probably is that employers, uncertain as to eventual cost or for other reasons, wished to have the right to withdraw or change the plan at any time if deemed necessary or advisable. Fortunately, recent developments in the field of retirement plans and the missionary and educational work of consulting actuaries, insurance companies, and other organizations have made available to employers practical plans on a sound financial basis, which should be a prerequisite of any contractual plan.

The trend in the future will be toward plans in which the contractual relationship will be such that the plan may be discontinued, altered, or suspended at any time, but that any such discontinuance, alteration, or suspension shall in no way affect benefits accruing from service previously rendered. This is a very equitable arrangement. No present administration should be able to obligate a future administration to continue a plan as to future service, and likewise no future administration should be able to cancel or repudiate any obligations for which financial provision had been made previously.

From my own experience, I think it is fair to say that employers are much more interested in making the plan legally enforceable than are the employees; probably because the latter do not question the payment of the pensions provided. When an employer is convinced that he has a plan under which he can definitely provide for the liabilities, and knows that he will not be saddled with a huge unexpected deficit in the future, he frequently is very willing to make the plan contractual.

Another change in trend may also be expected in the employer's attitude toward migration. By migration is meant changing employment, and most present plans provide for loss of all pension rights upon termination of employment. From the viewpoint of social philosophy, there is little question concerning the value of migration and, accordingly, when an employee leaves an employer, he should not forfeit the retirement income provided on account of the service rendered his former employer. A suggestion that such a provision would be a good one is frequently greeted with the statement that employers would never do it, because they want to hold the loss of pension rights as a deterrent to withdrawal. My answer is that two corporations,

each one of the largest in its field, have incorporated in their plans, provisions favorable to migration. Plans of a few other employers have similar provisions while necessary modifications are being considered for some existing plans. These plans are administered by insurance companies, which makes the inclusion of a migration provision much simpler than for a self-administered plan.

Employers are realizing that a pension at age 65 is practically no inducement for a young man to remain in service, because to him age 65 is far distant and he has no expectations that he will still be in the service at that time. On the other hand, the feeling has been expressed that if the employee knows that each year he will receive additional provision for old age not contingent upon remaining in service, he will stay on for one year, and then perhaps, for one more, and one more, in order to increase his protection against old age before changing employment. This may be a very hopeful attitude, but whatever the reason may be, the present indications are that a trend towards a liberal policy regarding migration has begun.

With the development of retirement plans on a contractual, contributory, and funded basis, it does not require much perception to see that sometime in the future retirement plans will come under the supervision and regulation of State Insurance Departments. The start towards such legislation has already been made in New York. It would only need the failure or collapse of several of the existing funds to greatly expedite any such movement. If state supervision of life insurance companies is justified, it is apparent that a convincing argument can likewise be made for the supervision of the retirement plan administered by the employer himself, for after all he is paying annuities and, therefore, doing an insurance business.

If, then, the industrial retirement plan of the future will have the above characteristics, I believe we will have developed a very satisfactory solution of the superannuation problem of the "industrial" group in this country. It will recognize that this group offers an entirely different problem than the social group. It will be based primarily on the principle of the prevention of loss of income by accumulation of income. It will not be individual prevention, for that cannot be realized except in a too

limited degree. It will not be relief or prevention by the state, for the variations and complexities of the conditions in this country are very unfavorable to any universal scheme. It will be prevention by industry itself, for it is responsible for the problem and is best fitted to solve it.

My forecast is not an impractical dream. American industry does not hesitate, if it thinks it wise, to disregard previous practices or customs and boldly strike out along new paths, and the attitude which industry has begun to take towards problems of old age, disability, and unemployment is well illustrated by the statement of Mr. E. C. DRAPER, Treasurer of Hills Brothers Company, who said:

My enthusiasm for preventive measures against evils of this character is primarily an economic one, because, being a business man, I like to view these problems from an economic standpoint. It is high time that modern business men stopped thinking about the hazards of industry as charitable problems and began thinking about them as industrial problems which directly affect their net income.

We need not look entirely to the future for progress. The stupendous growth of Group Life Insurance—with over three billions in force thirteen years after its inception—and its continual increase, is the contribution of American industry towards the removal of the specter of death from the workman. Through mutual benefit associations and Group Health Insurance industry is likewise assisting as to disability. As to old age, some employers have already established excellent retirement plans, but more remarkable is the fact that a great number of churches, educational institutions, and to a limited extent, governmental agencies, all notorious for supposed lack of business ability, have already in operation retirement plans which are built on a comparatively sound financial basis, and are thereby setting an example of excellent business practice to industry.

While close contact with many employers in this country has made me optimistic concerning the future development of industrial retirement plans, I know that the progress will not be accomplished easily. It will require constant intelligent missionary work in the education of the employers, with particular emphasis on the main practical questions involved. Such work



is being done now by groups representing employees, employers, and the public, and the members of the Casualty Actuarial Society are especially qualified, because of their knowledge of both the technical and social phases, to assist in it. Any efforts made will be well compensated, not only in the knowledge of a service performed for society but also in the pleasure derived from the study of a most interesting and intriguing subject.

ABSTRACT OF THE DISCUSSION OF PAPERS READ  
AT THE PREVIOUS MEETINGON THE USE OF JUDGMENT IN RATE MAKING—(PRESIDENTIAL  
ADDRESS) G. F. MICHELbacher

VOL. XII, PAGE I

WRITTEN DISCUSSION

MR. FREDERICK RICHARDSON:

The President is to be congratulated on his choice of subject and the skilful way in which he defends the statistical method. That method has not always produced results which could be termed comforting to underwriters and for that reason has been under fire.

It might not be out of place at this time to express our sense of satisfaction and our fellowship pride in his recent appointment to a still more eminent position in the world of insurance. His entry into the arena of practical and competitive business has some significance for us, and will, moreover, have an influence upon his own views concerning the aims and ambitions of Insurance Companies. Doubtless he will continue to seek the lofty and hyperborean atmosphere of these assemblies, here to renew and refresh his spirit in studying and admiring the lambent fires and coruscations that play about the *aurora borealis* of abstract mathematics. Be assured he will need that refreshment, for in the daily march he will be following, like others of us, the will o' the wisps that hover over the dismal swamps of a militant and sometimes dangerous enterprise. In that region one is pursued by swarms of hungry mosquitoes athirst for blood. *Our* blood and not somebody else's. And what a difference it makes! Here we can gather together with our *a*'s and our *b*'s and our *x*, *y*, *z*'s and our graphic outlines to postulate the cost of this and the incidence of that, and if our calculations happen to go awry, we, individually, are not a penny the worse. The burden of the experiment falls upon others. Of course, it is always better to be the doctor. One has the satisfaction of knowing what the patient died of! Therefore, being one of your

round-about patients, I view with unfeigned joy the passing, one by one, of our fellows into active and responsible positions in the business for which this Society hopes and deserves to provide the theoretical background.

The President says that judgment in rate making should be eliminated as far as possible. He admits that rates should keep pace with experience, but if needs be, at a distance and in automatic, analytical fashion because experience is particular and not general. It is not one problem but a number of problems each of which must be solved if justice is to be done.

And there precisely is the rub. Questions involving strict justice are of interminable solution. Something may be done with individual risks where they are large enough, but even then it is difficult in practice to overcome the natural tendency to ignore the "ups" whilst giving credits for the "downs". Analysis must stop somewhere, otherwise synthesis, which is the really important scientific process, will never begin. In 1916 dealing with some phases of rate making in a paper "Casualty Insurance, Probable Development and Need for Scientific Treatment of Statistics" I said, "Classifications must be broad or they are not classifications at all. There must be some room for the oscillations of experience. In the final analysis no two objects are absolutely alike, not even two Ford cars or two peas in a pod. A measure of uniqueness resides in all things. But we shall never get anywhere if we allow ourselves to be drawn into a wilderness of distinctions and minutiae. As well hope to catch ostriches with bird-lime or elephants with mole-traps as to hope to measure insurance averages in pint pots. We would lose sight of the larger game in beating out every little side-trail. So the fewer classifications and the fewer exceptions the better. Genius has been said to be the gift of seeing the similarities in things apparently dissimilar. It is able to devise universal laws from seeming contradictions. And this is precisely what the insurance principle does."

Personally I should say that the exercise of scientific judgment is paramount in these matters. There can be no dispute concerning the necessity for fairness and reasonable stability in rate making, but it is safe to conclude that there are greater disparities between individual risks in their groups than there is between groups, and it is scarcely to be doubted that with broader groups,

more scientific classification, and intelligent anticipation of conditions there would be more stability than is provided by the automatic method. I am disposed to think that our analytical basis is by no means final and we shall find it necessary to revise our views regarding the form analysis should take. We may be on the wrong track. We started out with a purely arbitrary basis because it was the only practical thing to do, but with the volume of experience behind us we might derive some notions as to whether there may not be a better way. Classification is not an easy thing even when you are dealing with comparatively fixed characters as in zoology, botany or chemistry. How much more difficult when you are dealing with characters not fixed? Still it probably took some imagination as well as systematic knowledge and scientific judgment to fix the family relationship of a humming-bird with a night hawk, or a stinging nettle with an elm tree. It is in the nature of things to classify themselves under a proper analytical method and this inherent quality may be present in the objects of our studies in rate making. It might take considerable time to establish relationships but it probably can be done. Claims afford the real basis for analytical treatment, their frequency and severity determining the main factor. Relationships of frequency and/or severity would be increasingly manifest as time went on so that groups would finally be formed by their own reactions. Any risks that showed persistent characters of severity and frequency which were not native to their groups would be thrown into higher or lower groups for observation. We might thus preclude the absurdity of a Superintendent of Insurance declining to let a risk carry a higher rate with the consent of the assured on the ground that to take it out of its classification would be in violation of the law. We might even settle the everlasting argument regarding experience rating!

A simple calculation made from numbers of severity and frequency will, of course, give a quick indication of any important change in the general experience. The following tabulation of compensation experience of my own company on a policy year basis from 1914 to 1924 inclusive, tells its own story. The average cost includes unallocated claim expense to disclose the gross loss ratio. There has been a consistent underwriting policy from 1917 on.

	Notices per \$1000 E. P.	Average cost inc. unallocated	Loss ratio
1914-15-16	26.6	29.2	77.67
1917	18.9	32.3	61.04
1918	15.8	34.1	53.88
1919	13.8	40.9	56.44
1920	9.5	56.3	53.48
1921	12.7	59.6	75.69
1922	13.1	59.0	77.29
1923	12.7	58.6	74.42
1924	13.4	54.8	73.43

It has not been difficult to forecast for twelve months in advance the probable number of notices and the average cost per claim. Moreover, in 1921 it did not take us long to realize that a radical change had taken place.

Frankly, would it not be useless to pursue such admirable studies as those contributed by Mowbray and Voogt and Leslie L. Hall to our last *Proceedings* if we are going to stand by the automatic method and eliminate judgment as far as possible? Surely it is not suggested that there is not a continuous shuffling of rates among the numerous classifications that we now have, so that the supposed requirements of absolute justice and stability are far from being met. The test of anything is whether it works, and a rating system which does not catch up with losses for several years, and does not stop excessive charges quickly, is not responsive enough for practical purposes. It attempts to hit a moving target at long range with a point blank weapon and affords no place for the use of our higher mathematical equipment. The increase of 15% made in compensation rates in 1917 was necessary at that time and could very easily have been modified in 1919 without injustice to any one. When we are talking of fairness, what fairness can there be in letting present employers have their insurance at less than cost because employers six or seven years ago paid too much. It smacks of the German system whereby present-day industry is burdened with the cripples handed down by a previous generation of employers. Correlations between claims frequency plus claims cost and wage levels and commodity prices are most significant, and it would not have been beyond our powers in 1921 to have applied a factor which would have enabled us to get much closer to the mark than we have actually been able to do by the automatic method, and with it changes in rates would have been less frequent.

Every now and then there are dangerous oscillations of experience which are capable of being recorded scientifically just as movements of the earth's crust are recorded by the seismograph. There are ascending and descending factors which are relative, so that the actuarial equipment is not complete unless a careful study has been made of the levels of moral hazard, of commodity prices, of the cost of repairs and reconstruction, of the scale of personal indemnities and the rise and fall of unemployment and the corresponding operating density. The actions and reactions can be promptly observed and precautions taken, and although our methods may be empirical at the start we shall soon refine the instruments. We are at present going through a secondary period of deflation which may become acute and it is already indicated that recent increases in compensation rates are not going to bring the loss ratios down to a proper level. Bear in mind that experience is not stationary and, therefore, all measurements are relative. If you scale down the low classifications too finely you will find that experience later on will not justify your conclusions. It is the principle of insurance to bring disparity to parity and that can only be done by a broad treatment. What does the National Bureau want with 540 statistical territories under observation? Any one who studies weather statistics sometimes finds that one station reporting a higher average normal temperature than another will have a late last frost date and an early first frost date, reducing the growing season to a smaller number of days than that of the station recording a lower average temperature. This is a vital point in agriculture. There are similar vital points in insurance classifications which will from time to time upset our fine calculations. Rate making may safely become automatic when we know all about it, but at present the exercise of constant judgment is imperative. There is no wide disagreement between Michelbacher and myself. We are both in favor of more statistics and more accurate instruments, but as insurance rates are anticipatory anyhow, I believe more ardently than he does in the use of intelligent anticipation instead of following a blind formula that puts rates down when they should be going up, and up when they should be going down.

As for the Commissioners and other authorities who make objection to increases in rates, they will be convinced of their

necessity when we show them that we know our business and when we all speak in the same accents and with the same voice. And if you are conservative enough to require precedents to be convinced of the soundness of my arguments I would call your attention to the greater stability of compensation rates in Pennsylvania with fewer classifications, and also to the fact that Personal Accident Insurance provides coverage for many kinds of occupations and all sorts and conditions of men in so few classes that you can count them on the fingers of one hand.

As for the idea of long term average there may be something in it, but there is no doubt it calls for extraordinary powers of endurance and unusual resources if insurance companies are to stay the course. Since 1921 it has been more like a cyclone than a cycle! We could all become rich if a formula would tell us what was going to happen, and then, of course, nobody would be rich at all! But fortunes have never been built up on statistical theories. They have been built up, like everything else worthwhile, on judgment *and* experience.

MR. C. H. FRANKLIN:

The discussion of any paper prepared by Mr. Michelbacher requires a certain amount of courage because he is such a past master in all matters which appertain to rate making and bureaus, that it is usual to assume he is correct in his views and generally speaking, he is. However, while in theory the views expressed in the above paper may be correct, still we know as a matter of practice that some of the results of past rate making have been very unfortunate for the companies. The results of the workmen's compensation business during the past three or four years have been so disastrous that no further proof is required of the necessity for improvement of the present rate making methods. For the year 1923 according to the New York Casualty Experience Exhibit, the earned compensation premiums were \$93,050,646, the losses incurred were \$62,891,225, showing a loss ratio of 68%. The 1924 New York Casualty Experience Exhibit gives workmen's compensation earned premiums of \$108,520,507, losses incurred \$77,659,492, which shows a loss ratio of 71%. For 1925, with a premium of \$126,703,111 the loss ratio is stated to be over 69%. For the past three years the companies reporting to the New York Insurance Department

have suffered an underwriting loss of about \$30,000,000 on their workmen's compensation business. Now, if the present methods of rate making be correct, then, I submit, those results should be impossible.

Our Past President states there are two methods of making rates, the first depending primarily upon the use of reasoning power and instinct, and only secondarily, if at all, upon statistical facts concerning the cost of insurance in the past. For these persons judgment is the guide. At the other extreme are those who feel that judgment should be eliminated entirely and that rates for the future should be obtained by a more or less mechanical process employing known statistical facts.

Mr. Michelbacher states that his preference is for the statistical method. I submit that there must be a middle path which should combine the advantages of both with a minimum of the disadvantages of either. It is apparent, and I think, requires no proof, that rate making must start from the knowledge of past experience. However, after we have obtained that past experience there is no reason we should blindly follow it. If the path that it marks leads to a precipice there is no reason we should tumble over the precipice. I submit it is reasonable to assume that a Great Creator has endowed us with such intelligence as we possess so that we can properly appreciate what past experience means, apply that knowledge to present conditions, and do in rate making what the business man is doing every day. It is frequently argued as a reason for applying the statistical formula procedure that it is easy to explain, but even that argument fails in view of troubles that have been experienced in various states, in meeting refusals to adopt the rates submitted upon grounds which may or may not appear good and sufficient upon examination.

In workmen's compensation business it is apparently a well known condition that the same law under exactly similar conditions costs a trifle more each year of its operation. Take the medical cost for instance. There has been a marked increase in medical cost during the few years prior to 1923, yet in making rates for 1926 the medical cost for 1923 is taken. Would it be unreasonable or unfair, would it be beyond the powers of the English language to explain, if an increase factor were applied to this 1923 medical cost in the same proportion as it had in-



creased over previous years? On the contrary, I believe it would be the only reasonable thing to do and yet under the formula system it is not done.

To sum up, in the workmen's compensation business the formula system has been tried, weighed in the balance and found wanting. Therefore, whether the injection of some judgment into the system such as I advocate is correct—there is one thing certain that the present method is incorrect—the theory does not square with the facts.

To come now to automobile business. At the present time this is as important or more important than the workmen's compensation business. In this case, strange to say, there is a little judgment introduced and this by the very Association with which our respected past president was connected. The automobile experience is largely based upon the pure premium of the last four years, then an average is taken, then that average is loaded, and I assume this loading is for the purpose of elevating the pure premium to where it should be. To this extent it would appear that the rate making in the automobile business has advanced beyond the rate making in compensation business. It has some proportion of intelligence injected into it, it is not the dry dead bones of the past experience, rattling out an unfortunate experience on present business. This method used in the automobile business supports my contention, that the injection of judgment into rate making is a proper, reasonable and more than that, a necessary thing. Everyone knows that the automobile business taken as a whole has been good. For the year 1923, according to the New York Casualty Experience Exhibit, the auto liability earned premiums were \$70,079,499 and the incurred losses \$31,949,464, and the net gain from underwriting \$4,455,560, showing a loss ratio of 45% and a profit ratio of 6%. For 1924 the auto liability earned premiums were \$87,033,991, the losses incurred were \$41,441,008 showing a loss ratio of 47%; the net gain from underwriting was \$6,107,997 giving a profit ratio of 7%. Now, why has it been better than the compensation? Why haven't we suffered the same loss in the automobile business as we have in the compensation? The answer I believe is to be found in the little leaven of judgment which has permeated one might say the whole loaf of automobile rate making in the past.

However, I believe that a tendency may be observed in the automobile business of making the lines of rate making in the two classes of business meet and I am sorry to see that the tendency is to screw the rate down. Whatever reasons may be underlying this, and we assume there must be some good reasons, the present automobile rates are, I should think, in proportion to the hazard, lower than they have been during the past few years. The reason for this may be the endeavor to meet the competition of the mutuals, reciprocals and that class of insurance. If one may judge from past history, there are always people who will insure in mutuals and reciprocals regardless of the rate difference. There has been one recent unfortunate reciprocal failure in the city of Chicago. Assessments are being made on the members and demand is also being made for return of dividends paid, but are the stock companies finding that they are increasing their business and taking it away from mutuals and reciprocals because of this? I do not think so. Insurance, even in liability lines which are admitted to be among the most difficult classes of insurance, is usually accepted by the public as being one of the easiest businesses possible. Anybody can run an insurance company. Mutuals spring up over night. When a man has failed in everything else he starts a mutual and succeeds so far as getting the premium income is concerned. There are many mutuals and reciprocals now transacting business which could not do it if they were under the same laws as stock companies. However, whatever the reason may be, the tendency seems to be to keep down the rates to as low a figure as possible. If a suggestion is in order it would be well in the future to apply as much benevolent judgment in the automobile rates as has been applied during the recent years—I would leave out the last year—because if the present methods are followed it appears to be the judgment not alone of the writer but of many men better qualified to speak and to give an opinion on this subject, that we are likely to encounter in the automobile business a period of disaster such as we have had in the compensation business.

It is stated that rate making should meet the tests of consistency, responsiveness and stability. In workmen's compensation insurance the rate making has been consistent and stable in producing a loss. Away with such consistency and stability. Let the rate makers be fair to the companies. The various reports

of the casualty companies have only to be examined during recent years to show how bad the business has been; it has only been saved by the stock market and the bond market. In a paper like this it would be out of place to refer to individual companies but the majority of the companies' reports show an underwriting loss, some of them quite large. If there should be a drop in the stock market and bond market at the 31st of December 1926 as compared with the 31st of December 1925, this question of rate making will become a very imperative one. The results to the insurance companies of the past methods will be felt decisively. It will not be possible to cover them up by increase of values of investments and by interest earnings.

We appreciate the difficulties in workmen's compensation business particularly. We know that it is in politics but it is a serious question whether the companies are justified in going along as they are now producing rates which are practically admitted to be insufficient. I am always glad to fall back on a reliable authority, and here I have the pleasure of quoting Professor Whitney of national fame as an insurance expert. On the present rates and possibilities of profit he states as follows:

"Rates in workmen's compensation insurance for instance are predicted upon experience which is as much as two years old when the rates are used, even when based upon loss ratios. Studies have been made in the attempt to correlate the hazard with business conditions but the result has been so unsatisfactory that rates have sometimes been reduced when they should have been put up and vice versa. The actuaries are about ready to conclude that a practical solution of the problem of bringing rates up to date cannot be had, at least at present. If this is admitted we must face the condition of having to use rates that are always behind the times. However, even if satisfactory projection methods could be devised, it is doubtful if state officials having the approval of rates under their jurisdiction could be persuaded to allow such methods to be used in general as a basis for rate determination. These officials are gentlemen who are inclined by nature to have more confidence in figures themselves than in actuarial theories however sound, and it may be taken for granted that the rates that they approve will be pretty close to the actual experience, particularly if the loss ratio appears to be rising. If this is the case, however, a rising loss ratio can mean only inadequate rates and it is therefore hard to see how the companies can possibly make any money, at least in the workmen's compensation field, under such a condition."

I humbly agree with him. As I look at this question of rate making, it is just the same as any other business. The way to make money is to use brains, not beef. The statistics are the beef of the rate making, and when we use the beef only—the senseless, unreasoning figures—we get what we deserve as exemplified in the workmen's compensation business; but if we use brains as have been used in the automobile business, and which I fondly hope will continue to be used, then we get better results.

In conclusion, I would refer to the very strongest criticism of the past methods of rate making in workmen's compensation, namely, the action of the companies in appointing a committee to consider the situation. This has occurred within the past few weeks. It is apparently the fond hope of the companies that something can be done to correct the purely statistical method of arriving at workmen's compensation rates, and if this is done we may have hopes for the future. If the statistical method pure and simple would still be adhered to it is hard to know how the companies can be helped except say by such a serious matter as another war, which would be buying the profits of workmen's compensation business at too dear a cost. Let us have sweet reasonableness on this rate making business.

MR. GEORGE F. HAYDON:

As might be expected, bearing in mind the years which he has spent in his particular sphere of usefulness, Mr. Michelbacher's conclusions naturally gravitate to awarding the "plum" to a mechanical system of rate making as opposed to the use of judgment. But despite this Mr. Michelbacher leaves nothing to the imagination. His presentation is well thought out, he has established his ground work and then proceeded to fix up the borders and generally lay out the pathways of its intricacies in a manner which I am tempted to say defies competition or criticism. In fact, with the exception of his rather fanciful differentiation between underwriters and rate makers, I am in rather general agreement with him; consequently this paper then resolves itself into merely confirming to a great extent the hypothesis upon which Mr. Michelbacher's address was built.

About the only silver lining which Mr. Michelbacher holds out for the advocates of judgment rating is contained in Chapter

VIII, but even then he withholds the cup just as he is about to present it, for, while admitting that judgment should not be eliminated entirely and thereby giving hope and comfort to his colleagues of the opposite viewpoint, he proceeds to discard his apparent friendly gesture and intimates that, while it is true judgment may be used, it is only in connection with the selection of the proper mechanical formula to be adopted. We of the mechanical school, as a matter of loyalty to the cloth and in defense of our everyday activities cannot, even though we might desire, take any exception to Mr. Michelbacher's treatise. However, at more or less frequent intervals, in fixing rates for individual risks, we individuals operating in regulated states, will run into the situation where the rate indicated by the established mandatory practice looks wrong, feels wrong, and probably is wrong. It is in such cases, that those of us who, largely by virtue of the summers which have been vouchsafed us, are more or less tainted or troubled with the "old school" principles, thresh against the bars and temporarily yearn for more freedom and latitude; which, again may merely represent an unexpected phase of the penalty of age.

Before the days of dependable statistics, naturally, the only principle which could be adopted and followed was that of judgment on the part of the underwriters who, as Mr. Michelbacher remarks would have to be "captured while young" and subjected to a protracted period of intensive training. As Mr. Michelbacher further intimates, about the only good thing which could come out of such a system was "responsiveness". And, unfortunately for the permanent success of the scheme, the responsiveness did not always respond. Furthermore, underwriters were made up of individuals just the same as every other profession, with their varying degrees of mental make-up; so that we had underwriters who were aggressive, underwriters who were conservative, and underwriters who were mere egoists, and, unfortunately, it was the latter type who were liable to be the freest in the profession. Such a condition could hardly exist in a mechanical procedure, wherein I would say, the only loop-hole for judgment would lie in those cases where, as a matter of good public policy, sharp fluctuation in individual rates should be guarded against despite the breadth of experience; and in those cases where the breadth of experience is insufficient or where there

seems to be sharp differences in the results and indications as between territories. I am satisfied that Mr. Michelbacher agrees with this conclusion.

Still continuing to confirm Mr. Michelbacher's findings, resulting from the regime of state control which is rapidly being fashioned throughout the country, certain criteria have to be met, and it is difficult to conceive how this can be brought about without resort to, and the extensive use of, some principle which will lend itself to visualization and measurement. In tabulating his important practical considerations which must be viewed in collaboration with the necessary criteria, Mr. Michelbacher awards first place to "consistency in method". I take it that Mr. Michelbacher refers to an ultimate goal rather than an expression of fact, for, as we look back upon the last decade and observe how we have gradually emerged from a condition not far removed from a stygian pall, and we trace our steps to our present halting place, which, if not the perfect light, is at least the corona, we are forced to admit that consistency was not our outstanding virtue. However, might it not be admitted that the facility to adopt new ideas and to effect almost chameleon changes, is in itself a noteworthy and praiseworthy symptom, and a tribute to an elasticity of mind leadership, thus holding the promise of a solution which can only be made possible and permanent by experimentation. However, be the facts as they may, the principle is regarded as a beacon, and past hopes seem to be very close to crystallizing into a future tangible worthiness.

The single noticeable flaw involved in the process of mechanical rate making lies, as Mr. Michelbacher states, in the somewhat difficult problem of bridging the gap between finished experience and current requirements, wherein it is possible for trend to mislead or be misinterpreted, or for a given cycle to fail to repeat itself. This objection would become a real difficulty in the event of the occurrence of a national disturbance, at which time, if any semblance of responsiveness in rates be retained, then, to continue on a strict mathematical schedule would invite disaster, and it is manifest that, under such circumstances, the injection of a judgment stabilizer would become necessary. This might be construed to be a point in favor of judgment rating: however, while not denying the possibility of such circumstances,

still the probability is sufficiently remote to warrant its exclusion from any consideration in rate making.

In summing up, it appears to me the time is now here when judgment as a sole principle in rate making is rapidly becoming discredited, and any attempt to satisfactorily demonstrate "method and results" could not withstand the standard of today's test. On the other hand, however, I am not prepared to say that the way should be entirely barred to the use of pure judgment or response to instinct, but, I will say, that such means should not be resorted to except in those cases where the measuring stick obviously fails.

MR. R. A. WHEELER:

We can scarcely do other than concur with Mr. Michelsbacher's very logical deduction that personal judgment as a factor in rate making should be eliminated so far as possible, duly recognizing however, that it cannot be dispensed with entirely. Personal judgment, indispensable in the pioneer stage of every business, must in the development of the business give way to facts developed by experience. It is essential to progress that the scientific method should replace the judgment method; otherwise we would be devoting our time to re-deciding matters that at great saving could be submitted to statistical and mathematical demonstration. It is only by this process that we are able to build upon past experience and knowledge, thereby liberating judgment to explore new fields and solve new problems.

Rate making in casualty insurance has already witnessed the transition from personal judgment methods to the scientific methods; in fact each year has marked a trend towards the ultimate goal of mechanical rate making, and the displacing of personal judgment. Nevertheless, the fact remains that the complexity of factors affecting the cost of casualty insurance, the inherent difficulties of correlating the future with the past, the ever present problem of adequacy of exposure, have necessarily in the past given personal judgment a wide range of freedom.

To minimize the exercise of judgment under these conditions it has been found necessary, in compensation insurance, to restate the problem of rate making. This has been done by starting with the single basic assumption that over a period of years

the future will reproduce the past, and translating this assumption into a mathematical formula by which the rates for a given year will be based upon the experience of certain specified years in the past. By this procedure there is a reasonable assurance that a consistent and continuous application of such a formula will produce rates, over a period of years, which will meet the requirements of adequacy, reasonableness and stability, although as Mr. Michelbacher points out it may sacrifice responsiveness. Hence the method places an added responsibility upon the companies to conserve the profits of profitable years to meet the losses of the unprofitable years. In short, it places upon the companies the necessity of insuring their aggregate business as between years as well as between risks and classes of business.

Progress has likewise been made in compensation insurance in eliminating the exercise of personal judgment in the matter of adequacy of exposure. Formulae have been constructed by which definite weights may be assigned to volume of exposure, between a state's experience and national experience.

We may sometime be able to make an absolute correlation between the past and the future, but even in this event it is doubtful if we should avail ourselves of this correlation as a basis for future rates, because of the resulting lack of stability in the rates from year to year. It is also possible that by somewhat radical revision of our present statistical methods, the present lag in our knowledge as to recent past experience may be reduced to a negligible factor. It may or may not be desirable to adjust our procedure to this later knowledge. In any event, research as to the correlation between the future and the past and as to the exact financial condition of a casualty company, up to the date of determining such financial condition should be undertaken if for no other reason than that knowledge of the extent of cycles of losses and profits is essential to the continued soundness of the companies. The greater knowledge they have regarding these matters, the better able they will be to adapt themselves to the rates projected in the future.

The ultimate goal of casualty insurance rate making should virtually be in the form of a contract between the companies and the public whereby certain agreed upon and recognized principles may be incorporated into mathematical formulae which shall be applied uniformly and consistently by states and



by classifications for an indefinite period in the future. Such an arrangement accompanied by appropriate administrative machinery for applying the rates will give assurance to both the companies and the public that rates over a period of years will be adequate and reasonable, equitable and non-discriminatory with a justifiable compromise between stability and responsiveness.

INDUSTRIAL ACCIDENT RATES IN THE BUSINESS CYCLE—  
W. G. VOOGT & A. H. MOWBRAY.

VOL. XII., PAGE 10

WRITTEN DISCUSSION

MISS O. E. OUTWATER:

The study which Mr. Voogt and Mr. Mowbray have made and have described in their paper presented at the last meeting show intensely interesting and significant results, which should also prove to be of great value if they succeed in instigating more wide spread and more extensive studies along the same line. But compensation rate making has passed through an experience which no one wishes to have repeated. Any new theories affecting the determination of rate levels must be well grounded before becoming acceptable for actual use. Moreover there is another mooted point which must be settled before the relationship between industrial accident rates and the business cycle, even though proved, can be applied. If the relationship can be measured so as to admit of practical application, the result will be to secure greater responsiveness and therefore, less stability; and there seems to be disagreement in the minds of underwriters and executives as to which of these qualities is more desirable. Apparently some are not yet quite ready to admit that they can't have both, yet the actual loss ratios of some states in recent years look anything but stable. The authors have well pointed out, however, that the theory is of significance not only in determining rate level but in connection with various features of the experience rating plan as well. Moreover, a better understanding of the fluctuation of accident rates is bound to be helpful in unforeseen ways and such investigations often develop facts entirely unlooked for.

As to changes in the methods of using the available data, we have no improvements to suggest. In many cases the results are approximate, it is true, but we believe they are quite accurate enough for the purpose in hand. Should it come to the use of data to determine actual measures for rate making purposes, some change in method and, more probably, some change in the data required might be necessary, but, for the present, we are thankful for statistics that are sufficiently complete for the present purpose.

Unfortunately for scientific purposes, there seems to be a fear in the minds of company statisticians that any new theory which requires more detailed statistics for proof, is likely to mean in the end more work and more cost for their departments and it is not, therefore, given a very cordial welcome. This is not a criticism of the statisticians. They have our sympathy as well as our thanks for the hard work they have done and are doing to meet the increasing demands for detailed information, but we have wondered if the monthly payrolls, so important in the proof of the theory, would be necessary in the later application of the theory. If not, perhaps such investigations might receive a little more encouragement from the guardians of the records.

Although the authors expressly state that they prefer to defer discussion of the significance of the results of their work for rate making purposes, still we wish they had gone just a little farther and compared the accident rate curve obtained with California loss ratios for corresponding periods. We realize that such comparison to be of value might involve numerous adjustments but we'd like to see it just the same.

It seems to us that Chart III follows the theory so beautifully that one feels like jumping at conclusions, drawing a sine curve, or one of that general shape, to represent the business cycle and then another flattened curve with both peak and trough modified and crossing the other about half way up and down each wave and then declaring that we have the accident rate curve. But experience has made us more cautious and instead we call attention to the hump in 1921 which the authors tell us was undoubtedly due to the revival of building activity. If our accident curve is so responsive to a single industry, surely we must go carefully in drawing conclusions and making application. Evidently data used for an investigation must be

uniform as to distribution of industry throughout the whole period studied, or else indicative results cannot be expected.

The results are so encouraging that we would like to urge the authors to extend their investigation as soon as later data is available and give the Society the benefit of the results. Still more we would like to urge upon any who are interested in the subject, a careful review of the sources of such statistics in an effort to obtain material of a similar sort, but for a different distribution of industry and, having found the material, to see that it is used to extend our information on this subject.

Is there a definite upward trend in some jurisdictions that does not exist in others? Will the same tendency be shown for all industries and if so, won't some lag behind others? In manufacturing industries will the labor saving factor described by Mr. L. L. Hall in his paper\* presented at our last meeting enter to such an extent that its influence may be seen in the curve? These and many more questions arise as we study this subject so that the possibilities seem unlimited, but—we must first find more material.

STATUTORY REQUIREMENTS FOR CASUALTY COMPANIES—

THOMAS F. TARBELL

VOL. XII., PAGE 29

WRITTEN DISCUSSION

MISS M. E. UHL:

Mr. Tarbell introduces his subject by stating that his purpose in preparing the paper "Statutory Requirements for Casualty Companies" is to provide an outline to which students may refer when preparing for examinations of the Society. He has undertaken this work because of the lack of suitable texts dealing with the subject and the length of time which will be required for the preparation of such texts.

The comprehensiveness of the subject with which Mr. Tarbell deals makes it impossible for him to present more than a general outline as many of the topics covered would in themselves each furnish material for an entire paper. A great deal of careful research has apparently been done by Mr. Tarbell on this subject

\*On the Tendency of Labor Saving to Increase Compensation Costs. Leslie L. Hall, *Proceedings*, Vol. XII, p. 62.

and a vast field of legislation has been covered in a general way.

Students who are preparing for the Fellowship examinations of the Society, as well as others who may have occasion to study this subject, should find this paper valuable. One student in speaking of Mr. Tarbell's paper referred particularly to the opportunity which it affords for comparisons between the statutes of the different states.

Mr. Tarbell has dealt with the state laws by topics beginning with "Incorporation" and following this by more than a dozen other headings which taken together cover the most important statutory requirements. An excellent method of developing many of the topics has been employed, namely, quotation from a state law selected for each topic because of its peculiar fitness as an example of the requirement under discussion accompanied by some comments upon the statute quoted and those of other states. Quotations from the New York law are used as the principal illustrations of provisions relating to the incorporation of stock casualty companies and capital requirements; the Oregon statute is given as an example of the anti-compact laws; the Connecticut statutes are quoted to illustrate anti-discriminatory laws, bankruptcy or insolvency liability laws, resident agent laws, agents qualification laws and reciprocal laws; and a quotation from the Pennsylvania statutes illustrates the retaliatory laws. Some of the topics are developed in a more comprehensive way by giving a rough summary of the state requirements in general. Mr. Tarbell's paper is replete with quotations from the state laws throughout and where it has been impracticable to quote appropriate statutes, definite references to the laws and other sources of information are frequently given. Thus the needs of the student have been constantly kept in mind.

One point which occurred to me when reading the paper under discussion is the extent by which insurance statutes are in actual practice supplemented by ruling of state insurance departments and other supervisory bodies and officials. Consider, for example, the requirements for the filing of rate manuals and rating plans with state authorities. The statutes of the states give only part of the story of the requirements that are actually in effect. In some states the requirements for the filing of rates rests entirely upon departmental rulings, while in others, the time

of filing, the form in which rates must be filed and other matters of procedure are established by rulings.

With regard to the presentation and study of some phases of state regulation of casualty insurance and casualty companies, I wish to point out here the advantages of digests of statutes and rulings compiled in tabular form. We have, in our office, made such compilations of the state laws and departmental rulings relating to the filing and approval of rates and the filing and approval of policy forms. Compilations in this form are very convenient for reference. Judging by the extensive subscription lists which have been developed by the demand for our digests, I should say that such compilations meet a real need.

Another subject which would lend itself particularly well to compilation in tabular form is "Taxes, Licenses, Fees and Assessments". I have seen some indications of the need for a digest of such provisions in a form more concise and convenient for use than any that is now available.

The Chamber of Commerce of the United States has made some studies of special state insurance taxes which should be both interesting and instructive to students of the Society. These studies have been published in the Insurance Bulletins of the Chamber of Commerce of the United States, Numbers 12, 15 and 21.

#### AUTHOR'S REVIEW OF DISCUSSION

MR. THOMAS F. TARBELL:

The two points brought out by Miss Uhl in her discussion are well worth bringing to the attention of our membership and prospective members. Departmental rulings constitute an important feature of the broader subject of State Supervision, of which Statutory Requirements or Provisions furnish the foundation. The evolution of insurance legislation has been a slow process and has not kept pace with changing conditions and the requirements of the business. It is impossible to cover every feature and detail of State Supervision by specific statute and consequently certain discretionary powers are enjoyed by supervising officials either as a result of statutory provisions, statutory implications or court rulings. The attitudes of courts on this subject has been to uphold the rulings of supervising officials provided the same are not contrary to statute law, non-discrimi-

natory and are issued in good faith. The extent to which courts have gone in this matter is illustrated by Connecticut where the Supreme Court of the state has held that the statutes vest the Commissioner with a wide range of discretion, with the exercise of which the courts will not interfere (45C.381) and that the powers of the Insurance Commissioners are administrative or quasi-judicial, rather than ministerial (60C. 461).

Compilations and digests such as those mentioned are very helpful aids to those whose work brings them in contact with state departments. A compilation of data relative to "Taxes, Licenses, Fees and Assessments" was recently made and issued by the Association of Casualty and Surety Statisticians and has proved very valuable.

I am indebted to Miss Uhl for pointing out a typographical error in the paper which I am glad to have the opportunity to correct. In the table captioned "Capital Requirements" on page 44, the parenthetical phrase following the word "Burglary" in the fifth line and reading "including jewelers' block" should read "excluding jewelers' block."

A STUDY OF JUDICIAL DECISIONS IN NEW YORK WORKMEN'S  
COMPENSATION CASES—LEON S. SENIOR

VOL. XII, PAGE 73

WRITTEN DISCUSSION

MR. JAMES G. HIGGINS\*:

Perhaps some actuaries and statisticians may have a justifiable mistrust of the so-called subtleties and the paradoxical refinements of reasoning sometimes found in the Law.

Nevertheless, Mr. Senior's comprehensive and appropriate treatise upon the importance to the actuary of knowledge of court decisions in compensation matters has accomplished two things admirably. It has shown that illumination of the actuarial field in this quarter does depend to some extent upon the light shed by the pronouncements of our highest courts. It has also provided a sound summary of the leading cases upon most of the chief phases of the statute, digested and analyzed without bias, for the purpose of indicating the judicial trend.

First, then, what of constitutionality? This is *the* subject

\*Assistant Claim Auditor of the New York State Insurance Fund.

of paramount importance. When the legislature enacts a law, we must be certain it is a valid law before existing rights are altered under its provisions. It is impossible to challenge either the appropriateness or the significance of the cases cited by Mr. Senior in connection with his review of this factor.

However, Mr. Senior observes that we have an "imperfect appreciation of the part played by the courts in changing the scope of the law." To gain a better appreciation we must inspect the background of the constitutional question.

Our legal system is both novel and complex. It is not the ancient Justinian code system defining rights and remedies which survives in various forms upon the continent of Europe invariably promulgated at the will of the sovereign monarch without reference to the wishes of the people. Neither is it the common law system of England under which the courts and the judges wrestling with questions of human rights through many centuries have formulated sterling principles in their decisions and opinions. Unaided by any legislature, they resisted any semblance of invasion of natural and acquired rights in such set manner as to almost mark them as simply jealous, narrow and reactionary. This was an unfortunate result of their peculiar double function of lawgiver and dispenser of justice. Yet, history shows that the system is sound, and although loath to part with venerable forms and rules, the common law courts do adjust themselves to the spirit and the innovations of the times.

The distinctively American system is hybrid or rather, conglomerate. In it the people themselves have established written constitutions as the basic controlling law, and all rights not conferred specifically by the constitutions are reserved by the people. In addition we have inherited the common law system and it still prevails except where the constitutions and enactments thereunder have supplanted it. Our jurisprudence even reverts to the common law for rules of constitutional interpretation whenever the written constitution does not provide them as needed. In brief, then, our legal system consists of written constitutions, common law precedents, statutory enactments which are declaratory definitions of certain phases of the common law and in addition original enactments which introduce novelty into the existing system. The compensation law is in the latter

class but its interpretation must be grounded upon the reasonable dictates of construction found in the common law. In view of what has just been set forth, it is of course "not difficult to follow the evidence of juristic writers to the effect that the process of lawmaking goes on continuously in the courts to a greater extent than in the halls of the legislature."

Truly, "the workmen's compensation law is a piece of creative legislation to be credited to the legislature and not to the Courts", and Mr. Senior gives a very interesting outline of the genesis of this statute beginning with the case of *Ives vs. The South Buffalo Railway Co.* which nullified the original New York State Compensation enactment of 1910 on constitutional grounds. In that very case Judge Werner reviewing the constitutional obstruction to the direct fulfilment of the widespread popular demand commented, "We have already admitted the strength of this appeal to a recognized and widely prevalent sentiment but we think it is an appeal which must be made to the People and not to the Courts."

No one dares deny that the injustice fostered by the old common law system in negligence cases cried for radical change but the system with supporting statutes was an essential part of our constitutional development so that when public clamor in 1910 stampeded the legislature to passage of the first workmen's compensation act in this State, it was only sound judicial action for our highest courts to point out that the legislature had done something totally unauthorized. Our constitution defines the sphere and orbit of the legislative as well as the executive and judicial branches. Just as often as legislatures overreach, just so often do the courts repress. This is not at all because the courts are inherently narrow in view or unduly jealous of the prerogatives of the other dominant branches of the government, it is because the courts with trained mind desire order and not chaos. So it happens that while the first effect of the action of the courts in a matter of this kind is apparently to defeat the popular will, the end result is otherwise. The courts having shown the absence of foundation for the construction desired, the builders adopted the proper means of laying the foundation, hence the nineteenth amendment to the New York State constitution, and the enactment of the present law.

Mr. Senior makes the conclusion that the courts are guided



by conservative legal principles applied in a liberal spirit and it would seem that no question should arise concerning this conclusion. The only difficulty is met in the application of the adjective "conservative" to the noun "principle." Must we say that the courts have conservative principles because they follow exact, well defined and clearly recognized rules? I think not. As indicated before we must recognize that the courts have had already established in their mass of precedent definite rules for the interpretation of statutes. So we find in early compensation annals the dictum that a presumption "does not permit the words of the statute to be warped from their usual and ordinary meaning," *Tomassi vs. Christensen*, 171 A. D. 284.

Wherefore, it at once becomes apparent that in considering the trend of judicial decisions we must remember not only the history of the legislation involved but we must bear in mind the fabric of the statute and the origin and relation of its amendments. Practically every amendment of our compensation statute has been due to the fact that a sound and reasonable court decision has exposed a deficiency or weakness in the original law, as a result of which the public voice sounding in the labor organization, in the political forum, in the industrial lobby, in the very halls of the Industrial Board and the Labor Department, or recorded in the public press has fashioned an amendment of elaboration or of extension or one of greater comprehension so that if at first blush certain court decisions appear narrow and restrictive, it is merely because the courts have conscientiously discharged their proper function with reference to a statute.

As mentioned before the fabric of the statute must always be borne in mind. An indication of the liberal spirit of the statute is found in the presumptions of Section 21 and the most interesting decision anent the application of these presumptions is found in the case of *Collins vs. The Brooklyn Union Gas Co.*, 171 A. D. 381. In this case a foreman collapsed upon the street and the evidence indicated that the fall was due to internal causes. The Commission found as a fact that the fall was due to tripping over an obstruction in the street. The court pointed out that the record was devoid of any proof that such an accident could have taken place and accordingly reversed the award. Now, does it not seem quite fundamental where the statute specifies accidental injuries as the basis for compensation that

the court should have pointed out the necessity of at least establishing *proof* of an accident before permitting the application of this most liberal legislation? If this fundamental restriction had not been pointed out, what end to fraud and chicanery?

Indeed the statute is liberal. Section 118 declares that technical rules of evidence or procedure shall not be required and expands this by saying that the judicial officer involved "shall not be bound by common law or statutory rules of evidence or by technical or formal rules of procedure." However, in the case of *Carrol vs. The Knickerbocker Ice Co.*, 169 A. D. 450, 218 N. Y. 435, where hearsay was the only foundation for the award, it was held that no award should be made unless supported by at least a residuum of legal evidence. Surely common sense again declares that the courts while apparently speaking in a restrictive sense indicate the minimum foundation for a claim where less would be an absurdity. Does this indicate that the court determinations are narrow or illiberal because in orderly fashion they perform their wonted duty of placing essential landmarks? "Is thy eye evil because I am good?"

Now both decisions last mentioned are procedural in scope and there are other procedural decisions which must be of interest from an actuarial standpoint because they bear upon the value of other cases. It may, therefore, be permissible to digress slightly from the essential subject matter of Mr. Senior's paper to indicate some of these cases.

Section 14 of the statute outlines formulae for computing weekly compensation rates. The section, however, says nothing as to whether the week to be considered should consist of 5, 5½, 6 or 7 working days. So it is interesting to note that in the case of *Beers vs. Beers Bros.*, 180 A. D. 760, the courts drew the conclusion that "the wages are earned in 300 days and, therefore, exclude Sundays." This is a common sense conclusion drawn from the intrinsic statute but the statute itself was not sufficient in completeness to determine that fact. In the same section the case of *Roskie vs. Amsterdam Yarn Mills*, 191 A. D. 649, by reversion to common law precedent established the rule that inasmuch as the common law did not recognize fractions of a day and the injured worked some part of each of 6 days, whatever he could earn in that time represented the weekly wages of the employment for a 6 day week.

Section 22 of the workmen's compensation law reads in part, "No such review shall affect such award as regards any moneys already paid." In the case of *Solotar vs. Neuglass Co.*, 228 N. Y. Rep. 508, the court laid down the rule that even though a change of conditions or new evidence discovered after payment of an original award should justify a higher rate in the case, no increase could properly take place in connection with payments already made prior to the date of the determination. Obviously this decision covers the legislative intent and precludes a great amount of confusion and readjustment of reserves and valuations.

The case last mentioned was also responsible for an amendment to the compensation law by pointing out another defect. Under Subdivision 5 of Section 14 the statute permits consideration of the normally expected increase of wages of an injured minor and the validity of this section was sustained by numerous decisions. However, the *Solotar* case, cited *supra*, made it clear that no injured minor could receive an upward revision of his compensation rate upon moneys already awarded and paid him. As a result the legislature amended Section 22 by adding the following words:—

"Except that an award for increased wages under Subdivision five of Section fourteen may be made effective from date of injury."

Again, the courts have expressed sound and liberal judgment in those cases where, in addition to the existing wage, tips, bonuses and other emoluments are received, by holding that these constitute an essential part of the employee's wage and numerous decisions have upheld computations based upon such items, *Sloate vs. The Rochester Taxicab Co.*, 221 N. Y. 491; *Ciarla vs. Solway Process Co.*, 226 N. Y. Rep. 566, etc.

Still another case of the procedural type which may be considered with profit is that of *Perino vs. The Lackawanna Steel Co.*, 241 N. Y. 312. The only point in that case was whether the single word "future" in Section 17 of the compensation law meant installments in the future as of the date of computation or in the future as of the date of death. Under an age honored rule of the Commission and the Industrial Board it was held that the word "future" related to the date of death. This interpretation was tested in the Appellate Division and was there affirmed with leave to go to the Court of Appeals. The

Court of Appeals in this particular instance saw fit to follow the rigorously exact application which the very word and its context indicated. Judge Lehman says in part, "An award which covers a period already passed is itself an adjudication that the right to compensation for that period had already accrued and the amount thereof may not be regarded as 'future installments' of compensation." This is an instance where we may fairly differ with juridical reasoning. It seems hard to believe that the legislature intended to put a premium upon alien non-residents remaining in this country *just long enough* to collect their full compensation under an award. Yet, such is the result of the Perino decision. This decision had an immediate and profound effect upon the loss reserve of practically every compensation carrier in New York State in this respect. It made necessary an upward retroactive revaluation of many cases in which for all intents and purposes properly fixed and legal valuations had been established for some time past.

We may now revert to the specific cases cited by Mr. Senior. We have already met upon and covered the ground of constitutionality with especial reference to New York State. I shall make no attempt to follow the order of sequence of subjects which Mr. Senior has adopted but I shall endeavor to group those cases which deserve comment as aptly as possible for the purposes of this discussion.

With reference to the exclusiveness of remedy of the compensation law, all who have carefully read the Shanahan case cited by Mr. Senior, must realize how completely it covers the field. It declares in substance that just so long as a contract of employment is in existence and the relations of master and servant prevail, just that long does the compensation law become the entire remedy for disability and for death arising out of and in the course of such employment. It is striking to note in this connection that the illegal employment of a minor is employment none the less and requires application of the workmen's compensation law as the exclusive remedy. *Noreen vs. Vogel*, 213 N. Y. 317.

Whenever the subject of coverage is broached, there arises in contemplation the idea of the courts seeking to make a path in the shadowy borderland and it is especially in these borderline cases where the question of coverage under the law is raised that we receive our clearest manifestation of the real trend of the

courts. As to injuries received on the way to or from work, in addition to the cases of Pierson, Urban, McInerney and Parramore, all appositely cited, I must advert to the case of *Littler vs. Fuller Co.*, 223 N. Y. 369. In this case the claimant was injured while riding from the place of work to a train upon an automobile furnished by the employer to transport employees between the job and the railroad station. Judge Pound said:—

“The place of injury was brought within the scope of the employment because Littler, when he was injured was ‘on his way \* \* \* from his duty within the precincts of the company’.”

This novel idea has otherwise been expressed as the theory of extension of the employer’s premises.

Another case recently determined which tends to liberalize application of the law along the same lines is found in the matter of *Lynch vs. The City of New York*, Court of Appeals, decided February 24, 1926. The claimant was a helper in a hospital on Welfare Island owned by the City of New York. The claimant lived on the island and on February 21, 1924 after completing her day’s work, she went to the nurses’ home about 500 feet from the hospital where she worked and prepared to leave the island to go to New York. While she was on her way from the nurses’ home, some snow upon the passage way which was her proper route caused her to fall and be injured. An award was allowed her overruling the Appellate Division. The Court evidently realized the fact that the City was the employer introduced an element of complication as it specifically notes that “the rule stated here would be pushed to illogical and absurd extremes if it were applied to all the sidewalks of New York over which city employees might pass on their way to and from their work.” The rule which the court indicates it has followed is found in the case of *Kowalek vs. N. Y. Cons. R. R. Co.*, 229 N. Y. 489, *i. e.*, “It is a general rule that if an employee is injured on the premises of the employer in going, with reasonable dispatch and method, to or from actual performance of the specific duties of the employment by a way provided by the employer or reasonably used by the employee, compensation must be awarded. The going to and from the actual work and the risk involved in it are reasonably incidental to the employment.”

An extraordinary instance of judicial liberalism is found

in the case of *Mason vs. Scheffer*, 203 A. D. 332. In this case the claimant who was a confectionery store salesman who also made outside collections of money for his employer and who held overnight moneys collected each day on his person lost his eye by a gun shot wound inflicted by a bandit at the claimant's home door five miles away from the place of employment one hour after stoppage of work and when only a few dollars of the employer's money were in the care of the claimant. The decision of the court granting compensation was by a vote of 3 to 2 overruling a dismissal of the claim by the Industrial Board. If it may be fairly said that the injury here occurred in the course of employment, it is equally difficult to find a ground upon which to predicate the idea that the assault arose out of the employment.

*Rydeen vs. Monarch Furniture Co.*, 214 N. Y. 295, is still another instance of the extreme of liberalism to which the court will extend the right to compensation. A quarrel arose over the manner of working between two men in a common employment. The majority of the court held that the accident arose out of the employment if it was connected with the employer's work and in a sense with his interests. In the very able dissenting opinion written by Justice McLaughlin sustaining the views of the Industrial Board and the Appellate Division it is, however, pointed out that the appellant followed the man who assaulted him away from the place where he worked to another part of the employer's premises and there provoked the assault by applying to his assailant a most vile and insulting epithet. It is of course fundamental that mere words never constitute an assault so we cannot fairly argue that Rydeen was the aggressor. Nevertheless, it seems far fetched to permit a man to receive compensation after he has gone out of his way to provoke a quarrel even in connection with his work.

On the other hand as an example of a more restrictive determination of our highest courts we may note the case of *Scholtzhauer vs. C & L Lunch Co.*, 233 N. Y. 12. In that case the deceased, a waitress, was shot to death by a negro fellow worker whose attentions she had spurned. The court said, "To justify the State Industrial Board in making an award, the injury complained of must have arisen both out of and in the course of the employment. It must have been received while the employee was doing the work for which he was employed. It must be one of the

risks connected with the employment, flowing therefrom as a natural consequence and directly connected with the work." To those conversant with early decisions, the quotation just given will strike a familiar note.

In connection with the subject of disease or infection as the result of accident, the recent case of *Lerner vs. Rump Bros.*, 241 N. Y. 153, calls for comment. In this case it was alleged that death was due to pneumonia which was the result of repeated exposure to excessive cold in the employer's icebox during the course of regular employment. The Court of Appeals found that the circumstances narrated gave ground for no conclusion that there had been an accident within the meaning of the law. The *Lerner* case gives food for reflection when compared with the *Connelly* case quoted at length by Mr. Senior.

There would be no difficulty in multiplying examples showing beyond dispute the wholesome trend of the impulse of our courts and the very fact that in an impartially selected group of leading decisions we find one or two of conservative type serves by contrast to prove the rule. But there are other considerations which also support a conclusion of almost unqualified liberalism in the courts. For example, upon the subject of extraterritoriality covered by Mr. Senior with thoroughness, the courts have utilized what would appear to be extremely frail supports for their determinations. Having found jurisdiction of the res of the contract of employment entered into within the territorial confines of New York State, they reach abroad solely by authority of two brief phrases in the law, namely, the first presumption of Section 21, "That the claim comes within the provision of this chapter;" and the language of Subdivision 4, Section 2, "in the service of an employer \* \* \* \* or in the course of his employment *away* from the plant of his employer."

In concluding, Mr. Senior says, "It is not surprising that the courts steeped in traditions of the common law should have been slow in yielding to the new social philosophy and slow in accepting it as part of the American jurisprudence. As it emerged from the hands of the legislature, the figure of the new goddess was blurred and indistinct. Now the mist is clearing away; the many puzzling questions have been answered." May we not add to this the earnest observation that the clarity and the generosity

of the answers have called into being a smile of approbation upon the face of the goddess?

THE STATISTICAL SURVEY OF THE MASSACHUSETTS COMMISSION  
INVESTIGATING THE QUESTION OF OLD AGE PENSIONS—

EDMUND S. COGSWELL.

VOL. XII., PAGE 97

WRITTEN DISCUSSION

MISS M. A. BURT:

Since Mr. Cogswell presented his paper in which he described the statistical investigation which was made by the Massachusetts Commission investigating the question of old age pensions, the report of the Commission has been printed as Senate Document No. 5 of the Massachusetts Legislature, dated November, 1925. This report is a very substantial contribution to the information on the subject of old age pensions.

The paper gives a condensed summary of the statistical findings of the Commission and the methods employed in obtaining them. As Mr. Cogswell was in active charge of the work we have an authoritative summary by one entirely qualified to present the results. His paper together with the more detailed description of the investigation as given in the Commission's report will be of real value to anyone who may be called upon to deal with the problems relating to old age pensions.

Old age pension schemes, as thus far established in this country, appear to be quite different from staff pension funds. Under the staff pension fund an attempt is made to distribute part of the income earned during the productive years of a group of employees over the non-productive years which follow. If rightly constituted, such plans promote thrift. The old age pension plan may operate in a corresponding way with the entire population taken as a whole, or it may work in almost the reverse manner, in that it may take from the thrifty to reward the thriftless, or from one group of productive members of society to pay the non-productive. In other words, under a staff pension plan, all of the members of the active service contribute either by direct deductions from compensation or by indirect contributions provided for by an adjustment of their compensation, so that all who live may be entitled to claim pensions in old age. A plan which gives all of the accumulated contributions of the active



members who reach old age to those of the group who have no outside savings, or who are dependent, might be termed unfair and would hardly encourage thrift among the employees. Yet in the case of old age pensions, most of the states have apparently gone on the theory that all of the members of the population should contribute toward old age pensions during their productive years and then the entire contributions should be used in providing pensions not for the old members of the group who made the contributions but only for those members who have no other savings, or who are dependent.

If there is any justification for a system which apparently works as unfairly to the thrifty wage earner as many of the old age systems do, then it must be on the ground of charity. Figures such as Mr. Cogswell has presented, will eventually indicate whether the public, if it is to extend its support to dependent old age, can do it more effectively by means of properly organized institutions where comfortable living may be provided at a minimum of overhead expense or whether subsistence is to be supplied to the dependent aged in the form of cash payments, to be disbursed by them on an individual basis for the necessities of life.

Reports on old age pensions so frequently attempt to organize statistics apparently for the purpose of justifying some conclusions independently arrived at, that figures such as Mr. Cogswell presents are welcome. His figures are presented in an unbiased way and he does not indicate the conclusions which he himself has reached in the matter of old age relief. In fact, the five members of the Commission were divided in their recommendations, three members signing the majority recommendations, while two members including the chairman signed the dissenting recommendations of the minority.

Mr. Cogswell seems to have kept to his roll of technical assistant to the Commission and in that capacity to have furnished facts rather than opinion.

STATE REGULATION OF INSURANCE RATES—CLARENCE W. HOBBS  
VOL. XI., PAGE 218  
WRITTEN DISCUSSION  
MR. HERBERT HESS:

This article cannot but commend itself to the thoughtful reader. It is a paper which, in a very splendid way, attempts to

trace the history and growth of state regulation of premium rates and contains a summary of the laws enacted by the various states to regulate premium rates. It is, however, a paper one would look for in the proceedings of a society devoted to the study of political science rather than the *Proceedings* of our society which is devoted to an exact science.

It is the opinion of the reviewer that no one will dispute the state has three alternatives by which it can observe corporations, *viz.*, supervision, regulation and administration. We have had supervision with us, we are entering into state regulation, and the proposal was recently made for the state to participate in the administration of insurance companies.

The entire paper is devoted to state regulation of rates and leads the reader to believe the legislatures of the various states were compelled to enact such legislation for the public weal, and for the further reason that prior to state regulation of premium rates we were witnessing the very horrible results of "unrestricted competition."

By reading this paper, one would believe the mortality and casualties of the insurance carriers on the battlefield of "unrestricted competition" were as great as those on the battlefields of Flanders during the World War. The insurance carriers, according to Mr. Hobbs, were in dire straits, most of them insolvent and many of them ready to sink into oblivion, despite the prosperity enjoyed by other industries throughout our country.

I wonder whether Mr. Hobbs is correct in his diagnosis of the condition of the insurance carriers prior to the advent of state regulation of premium rates. I have reviewed the condition of the companies prior to that time and although my observation covers a period of the past twenty years, I am unable to bring myself to the conclusion he arrives at.

It seems very unfair, as well as inconceivable, that the insurance business be compared with the public utility business, any more than an automobile or bus manufacturer can be compared with an insurance carrier, or a clothing manufacturer can be compared with a banker. As long as there is money to be made in the insurance business, capital will always be attracted to it and no monopoly will ever exist, but public utilities are what we may term "natural monopolies." Since the comparison has been

made of insurance carriers with public utilities, it might be well to examine how these two different types of business operate under state regulation of rates.

In the paper under discussion, the danger of inadequate rates being promulgated is very lightly dismissed with the assurance that should the state ever promulgate a rate which would produce an underwriting loss, the insurance carrier can obtain relief from the courts, the same as a public utility does, because any rates promulgated by the state can be reviewed by the court to determine whether they are reasonable or confiscatory. It is a very grand picture, one which might lull the companies into a false sense of security if it were not examined carefully as to the results of its practical application to insurance carriers. Therefore, let us assume the state promulgates a grossly inadequate rate.

The procedure of the insurance carrier would be to appear before the court, ask for relief by an increase in rates, claiming that the rate promulgated produces a loss and therefore is confiscatory. After argument, the usual procedure for the court is to grant a temporary increase in the rate, but the money so received is impounded because the court must first determine for itself whether the rates are adequate or inadequate.

In order for the court to determine the reasonableness of the rates, it appoints a referee to take testimony, employ experts and perform such other work as is necessary for the proper determination of the facts, and to report his findings to the court. Upon the findings of the referee, the court issues its final decree.

Investigations of matters of this character usually take over a year, and sometimes years, to complete. In the meanwhile, the company has obtained an increased rate, but the money so received is "trustee funds" and does not belong to the company until the referee has reported to the court and the court issued its final decree. How will this benefit the company when the time for filing financial statements is at hand? Let us assume the company, through inadequate rates has lost tremendous sums, sums which might not alone impair its capital, but entirely wipe it out. It is true the company has received additional premiums through the court's orders, but these premiums are "trustee funds" and it seems inconceivable for a supervising official to permit the company to take credit for funds which

do not belong to it, especially when the supervising official either promulgates the premium rates or is desirous of maintaining them.

In view of these facts, the company would not alone be compelled to discontinue writing business, but might be thrown in the hands of a Receiver for liquidation, pending the outcome of the court's decree as to the disposition of the funds obtained through the increased rate.

No insurance company can continue business while its capital is impaired, nor can it carry on its business while in the hands of a Receiver. A public utility can continue its business, even though its capital is impaired and is in the hands of a Receiver. Therefore, due to this one important dissimilarity alone, it is unfair to compare the public utility business with the insurance business.

Let us assume a reverse case—that the state promulgates a rate much higher than it should be. What will be the ultimate result? It is my judgment that the large assureds will become self-insurers because the rate being too high, they can rightfully, and have demonstrated their ability to, carry their own insurance. The desirable small insurer, by reason of seeing the fabulous dividends being declared due to the high premium rate, will seek his insurance from participating companies. The pure stock companies, offering nothing in return as a refund on the premium, will thereby be deprived of desirable business, and the undesirable business will gravitate to them.

Under these conditions I wonder whether a pure stock non-participating company could appear in court asking for relief on the grounds that the rate is too high and therefore confiscatory. As Mr. Hobbs compares the insurance business with the public utility business, we are obligated to look for a precedent for this novel situation. I do not know of any similar circumstance where a public utility company appeared before the court and demanded that the regulatory powers be compelled to reduce the rates. It surely would take a Blackstone to argue that because the rate is too high, it is confiscatory.

For the sake of an example, let us assume a stock company has appeared before the court and the court has appointed a referee to take testimony and to determine the facts for the court to act upon. While the referee is engaged in his studies the stock

companies would be required to charge the premium promulgated by the state and would in my judgment by reason of this fact have extreme difficulty to induce the insuring public to place the business with it, even though a promise was implied or made of a refund, depending on the court's decision. It, therefore, appears possible for state regulation to effect the retirement of non-participating carriers from the business world.

Referring to "unrestricted competition" and to the doleful condition of the insurance carriers resulting therefrom, as pictured by Mr. Hobbs, it seems to me that during the past twenty years we have never had "unrestricted competition", unless you wish to define "unrestricted competition" as covering premium rates charged and acquisition costs. We have had "unrestricted competition" as regards these two factors, but combined with this we always have had state supervision, and it is maintained that as long as there was state supervision, "unrestricted competition" in its true sense did not exist.

Let us observe how the life insurance business is being transacted. Life insurance has operated and is today operating under Mr. Hobb's interpretation of "unrestricted competition", and no one will dispute the fact that the life insurance business of this country is on a sound financial basis and is being conducted according to the best business standards. As for myself, I think the life insurance business is one of the very great achievements of America, not alone as to its size and financial stability, and its manner and methods of transacting business, but to the contribution it is making to the economic welfare of our country. If life insurance can be conducted and can prosper under "unrestricted competition," then there seems no reason why the casualty business cannot operate under the same rules as govern life insurance.

The life insurance business is being transacted under strict state supervision. It is required to file with the state authorities copies of its premium rates and policy forms. The state properly compels the life insurance companies to maintain adequate reserves on all policies issued, in order that when a claim matures the company will be in a financial condition to meet its policy obligations. This is the primary function of the state—to protect its citizens.

As the life insurance companies are given the greatest freedom

in operation and can charge whatever rate they deem proper, but at the same time are compelled to maintain proper reserves, so likewise should the casualty companies be governed. The casualty insurance carriers should be required to file with the state, a manual of their rates, their schedule and experience rating plans, and a copy of their policy contracts. In turn, the state should be in a position to promulgate adequate reserves necessary to be maintained on all policies issued, so that the casualty insurance carriers can meet their policy obligations as they mature. The state in so doing, discharges its primary obligations to its citizens, *i. e.*, to protect the insuring public so that when it purchases a contract of insurance from an insurance carrier licensed by the state, it will be reasonably assured that whenever claims occur the insurance carrier will meet its contractual obligations.

As the state is able to promulgate adequate premiums, it is also able to promulgate adequate reserves (due to the efforts of the members of this society). Therefore, if through competition companies charge inadequate rates, but are compelled to maintain adequate reserves, it is apparent that such companies charging inadequate rates cannot do so for any great length of time. The state, therefore, by requiring companies to maintain adequate reserves will obtain the same, if not better results than by promulgating rates; and will accomplish this result without resorting to regulation.

To summarize, it seems almost apparent that with the state promulgating a uniform rate, the final result will be the elimination of non-participating insurance. The non-participating stock companies have and are rendering a real economic service and its elimination would be a sad commentary on state regulation. With the elimination of non-participating companies, it can easily be foreseen that competition will no longer be based on initial premium cost but on ultimate premium cost. Hence, the future competition between companies will revolve around dividend payments to policyholders.

It requires very little imagination to see the innumerable possible schemes to concoct for the calculation of dividends when we take into consideration not alone the fertile brains of the brokers, agents and insurance officials, but the 800 different

classifications in the principal (workmen's compensation and automobile) lines of casualty insurance.

State regulation of rates leads to this form of competition. Is this form of competition superior to "unrestricted competition?"

#### AUTHOR'S REVIEW OF DISCUSSIONS

MR. CLARENCE W. HOBBS:

I must own to a feeling of gratification at the length and painstaking character of Mr. Hess's discussion, and appreciate the complimentary nature of the introductory sentences. The concluding sentence of the first paragraph on the other hand, awakens emotion of a very different nature. "It is" says Mr. Hess "a paper one would look for in the proceedings of a Society devoted to the study of political science, rather than the proceedings of our Society which is devoted to an exact science". If I have been guilty of the high offense of discussing an unsanctified theme within hallowed precincts, I am properly contrite. But I am by no means sure that Mr. Hess has correctly interpreted the direction of our Society's devotions. Within the small space of my own experience, the Society has devoted much time to problems of statistics and of rate making, and if either of these subjects comes within the category of exact science, it is news to me. I also recall to have heard discussions bearing on legal decisions and statutes, not strikingly dissimilar in kind from the paper I have presented. May I trust, therefore, that Mr. Hess's condemnation does not so reflect the sentiment of the Society as to leave me absolutely out of court.

As to the substance of Mr. Hess's discussion, I am somewhat at a loss to see how he extracted what he apparently did out of my paper. That paper was designed to set forth the present situation as to the attitude of the states towards insurance rates and the legislative theories involved in the various types of legislation. He apparently interprets this as a partisan brief in favor of state regulation of insurance rates: a view which the concluding paragraph of the paper should have effectively negated. He charges me with having painted a lurid picture of the ills of insurance companies prior to state regulation of rates, and questions the accuracy of the diagnosis. This is, I think, a pure misapprehension based on a very general statement as to possible results of

unrestricted competition. Most branches of insurance have had, and are still having, competitive spasms, not in all lines at once, nor in all states at once: and while Mr. Hess's investigation of twenty years is not such a very long period as American insurance goes, yet even that period includes some insurance history decidedly interesting from the underwriter's standpoint. It is not such a very long while ago that rate competition in surety business reached a point that left several large companies in a rather shaky position: but competition has never gone to the length of bringing the business generally to the condition which Mr. Hess charges me with describing. Nor was such a condition the proximate cause of state regulation. Instead, competitive losses led in the first place to gentlemen's agreements as to rates and rating practices and to the establishment of rating organizations, or at least furnished a very effective inducement toward participation therein. One casualty executive described the usual procedure somewhat as follows: "When things get very bad and we all are losing money, then we all realize something must be done, and are able to get together. Then when conditions improve and we all are making money we begin to drift apart, and to disagree and to trim, and presently we are all fighting again, and conditions get bad, and finally we appreciate generally once more that something must be done, and are able to get together again".

It was these private rating agreements that led to the first legislative action; namely, anti-trust laws. The rating laws, properly so-called were based on a legislative conviction that the rating organization was necessary, and on the further conviction that unless controlled, it might be used unfairly. In some cases they were used to supplement anti-trust laws, in other cases were enacted independently of such laws. I doubt if actual distress among the companies was a compelling motive, generally speaking, toward their enactment.

It is clear enough that Mr. Hess is not content with these laws, and has a very different conception of the duty of the state. He devotes much space to argument against the unfairness and inconceivability of comparing insurance companies with public utilities. Now there exists a well marked line of cleavage between the two classes of companies: but it remains a fact that as regards their rates the regulatory powers of the state are as to



both classes substantially identical. This is a fact by reason of the decisions of the Supreme Court. I take it that Mr. Hess is not challenging this fact, but arguing against the enactment of legislation irrespective of the right to enact it.

I am unable to discuss at length the points of legal procedure raised by Mr. Hess. There is a remedy through the courts against unjust rating decisions on the part of state authorities. It is undoubtedly a somewhat tedious and difficult remedy, which may or may not accomplish entire justice. There seems, however, no reason to apprehend a worse situation than in the case of public utilities. In fact the practical situation of the companies is on the whole better. A single rating decision affects at most the rates in a single state and on one kind of insurance. If a company possesses, as it should, a well varied business, and one distributed in many states, a single rating decision will not affect more than a fraction of its business. Moreover, it is not tied down by franchises and ponderous masses of equipment and construction to operate in a particular state. It has to be sure an investment: but it can quit a state or at least curtail its operations without suffering a damaging loss, and so can avoid the evils which Mr. Hess portrays. Possibly he has in mind a one line company doing business in a single state: but such companies, are, after all, rare.

I will not dwell at length upon Mr. Hess's description of the ordinary course of procedure in a rating case, though sorely tempted to do so. He is clearly wrong in his description of the character of interlocutory relief granted by the courts, and also in his conception that a sequestration of premiums is inevitable: but these inaccuracies are after all of slight importance. His point that in case a state establishes an excessive rate, a stock company is at a distinct disadvantage is not without force: but the company is by no means without effective redress. It could not of course maintain that an excessive rate was confiscatory. A policyholder could, however, raise the question of confiscation. Up to date, however, no serious trouble has been engendered or is likely to be, by excessive rates forced upon the stock companies: nay, there are even a number of stock companies which would revel in that form of compulsion. Inadequate rates are a more serious menace: but on the whole, difficulties with state authorities over rates are not a serious matter. I doubt in any event if a

state legislature would withhold its regulatory hand merely because the companies subject to the law would find difficulty in obtaining redress for administrative injustice.

Mr. Hess's main point, however, appears to be to urge for casualty companies, the same style of regulation as applied to life companies. His idea is that the life companies are required only to file copies of premium rates and policy forms and to maintain adequate reserves. "As the life insurance companies are given the greatest freedom in operation and can charge whatever rate they deem proper", he says, "but at the same time are compelled to maintain proper reserves, so likewise should the casualty companies be governed". That companies subject to section 97 of the New York law enjoy the greatest freedom in operation is a concept decidedly new and novel. Also under section 85 of the same law, the preposterous reserves required the moment the rate dips below the net premium according to the mortality tables prescribed for setting up the reserve, make the statement that they can charge whatever rate they deem proper, hardly one which should be made to a society which shortly before was described as being devoted to an exact science. As a matter of fact the life companies had their session some twenty years ago with the legislatures and have been pretty well tied up ever since. Their prosperity is certainly not due to a minimum of legislative and administrative interference: rather to the fact that having obtained general legislative recognition of the American experience table and effectively prevented rates being cut much below the net rates based on that table, they could hardly do otherwise than prosper.

Undoubtedly, as Mr. Hess states, the primary function of the state is to protect its citizens. Protection against loss by insolvency of insurance carriers is one function which the state discharges with a fair measure of success. But is that the only protection the citizen is entitled to? Mr. Hess seems to think it is.

It is at least arguable, however, that insurance companies should in equity play fair with their policy holders, extending to one just as favorable treatment as another so long as they present the same conditions of hazard. But when rate competition exists, the big risks usually command much better treatment than the little risks. It is arguable with more force that if a

company or a bureau makes an excessive or arbitrary rate there should be some method of securing relief. And it may be observed that with free competition permitted the company with ample resources is in a position to put the small company out of business. None of these evils are corrected by the very modest measure of administrative regulation which Mr. Hess allows.

Now it may be observed that in some states the necessity of enacting legislation to effect this protection does not appear. When the worst effects of competition have been done away by agreement, and when the companies and their organizations are reasonably responsive to public opinion and willing to meet state authorities half way in the settlement of complaints, there is no particular need of going further and complicating the rating machinery by an additional cog. Most state departments are not eagerly thirsting for entrance into a technical and difficult field, requiring that they equip themselves with expert assistants, and spend much time in passing on questions intricate in themselves and not infrequently charged with a distinctly personal and political quality. But when companies fail to impress their policyholders and their competitors with their equity and moderation, it is difficult to avoid bringing the state in as the natural party to secure a justice not voluntarily accorded.

AN EDUCATIONAL PROGRAM IN ECONOMICS FOR INSURANCE

STUDENTS—EDWIN W. KOPF

VOL. XII, PAGE 283

WRITTEN DISCUSSION

MR. WILLIAM B. BAILEY:

A few centuries ago the security of the average individual depended upon his feudal chief or the organizations which were formed for mutual support. The serf or retainer looked to his lord for assistance in time of trouble. Through a mutuality of rights and duties the lord demanded certain services from his men and in return granted them certain privileges including assistance in time of need.

The guilds of one sort or another safeguarded their members against the ordinary vicissitudes of life. The industrial life of the communities was extremely simple and the existing rights and

duties were intelligible and based upon assumptions which were quite reasonable at the time.

The discovery of gunpowder which destroyed the supremacy of the armed knight on horseback made it increasingly difficult for the lord to protect his people; while the application of steam to the engine dealt the death blow to the handicraft system. These changes were so violent and far reaching that they have been given the name of the "Industrial Revolution".

Toward the end of the 18th century several social and economic changes became apparent. The specialization and growth of industry developed the separate functions of employer, laborer, and capitalist. The introduction of power machinery made possible the employment of women and children, since brute strength in labor was no longer a prime requisite along many lines. The fact that these power driven machines never grew tired increased the apparent desirability of long working hours and the theory became prevalent that the profit was all made in the last hour. These machines were relentless in their power and brought with them a train of fatal and dismembering accidents. The risks of industry and occupation became increased and more or less centralized. The development of the spirit of individualism which followed the French revolution placed the responsibility pretty squarely upon the worker. This was reflected in the economic doctrines of this period with the emphasis upon "laissez faire".

Gradually the injustice of this view became apparent and the assumption of risk was slowly passed to the industry and employer. He was allowed to pass this on to the consumer who ultimately foots the bills. European countries, accepting this premise, concluded that if the community pays the bills, the state should furnish the insurance against the hazards which accompany modern industrial life. The United States has not accepted too readily the doctrine of state responsibility. With the wonderful opportunities of this undeveloped territory the American has been more willing to claim his rights and accept his duties. Wages have always been relatively high in this country and an abundance of cheap land has made for a wide distribution in the ownership of real estate.

Initiative and thrift have always distinguished our people. The visible wealth of our country to-day is witness to the fact that

we have constantly spent less than our incomes and from this surplus our buildings, bridges, highways, railroads, and canals have grown. With almost complete freedom of initiative there is no submerged group in this country but social classes are in a state of continual flux. With this opportunity for marvelous success, we accepted the possibility of failure.

Industrial accidents which are to a certain extent the result of chance and beyond the power of the individual to avoid, we have frankly placed upon industry; but even here we go back of the aleatory element and through inspection and education try to reduce its toll. Sympathy for the unfortunate nowhere meets a more ready response than in this country and we are unwilling as a nation to allow the victims of misfortune to be thrust upon the state.

The phenomenal growth of insurance in this country during the past few decades gives ample proof that our people are resolved to make provision against their own days of adversity. The proportion of the savings of the people which are being entrusted to the care of insurance companies is continually increasing. The hazards of industry and modern life are being placed in the hands of strong and growing casualty companies which are amply secured to safeguard us. It seems inevitable that anyone who enters the employ of one of these great companies with the hope that he will ultimately attain to a position of responsibility is false to his trust unless he becomes grounded in the fundamental principles of economics and acquainted with the economic and industrial history of Europe and America during the past two centuries.

With the tremendous responsibility and confidence which our people are placing in these companies the least we can demand is that those responsible for their management shall not be following too many false economic gods, and thereby endanger the security of the savings which our people have entrusted to them against the hour of need.

## REVIEWS OF PUBLICATIONS

RALPH H. BLANCHARD, BOOK REVIEW EDITOR

*General Problems of Social Insurance.* International Labour Office, Studies and Reports, Series M, No. 1, Geneva, 1925. Pp. xxviii, 136.

The purpose of this report is to provide not only a theoretical study of social insurance, but to present "in a bare and schematic form a synopsis . . . of the different conceptions which underlie legislation and of the different modes in which those conceptions have been realized."

There are other separate studies of the various types of social insurance against industrial accidents, sickness and unemployment, published by the International Labour Office. Without these the present volume would indeed be too "bare and schematic" for those not so familiar with the subject. The entire field of legislation on social insurance, except that of the United States and Mexico, comprising some two hundred laws in about sixty states, is considered in a brief 160 pages.

Attention should first of all be directed to the introduction, which deals briefly with historical developments. The story of the causes that gave rise to the conceptions of social insurance runs something like this. After the French Revolution the working man found himself politically free. But after the industrial revolution, in spite of this political freedom, and because of his miserable wages, he was unable to free himself from economic disasters resulting from accidents, sickness, invalidity, old age, unemployment and death. Not even the Friendly Societies, the mutual aid movements, and the welfare schemes of the employers could meet the workingman's plight. Because of these failures, however, a new conception of the social function of the state was born in the latter part of the nineteenth century. From then on, beginning in Germany, the individual was required by law to exercise thrift and provide for his future. From Germany the idea gradually spread until to-day nearly sixty countries recognize, more or less, this social function of the state.

Having accepted social insurance, it becomes necessary to define its scope. There are a number of conceptions defining the beneficiaries. The first that comes to mind is that all individuals

should be protected by a national insurance system. Back of it lies the principle that all persons are obliged to provide for the future during their working life or financial prosperity so as not to become a charge on the community later. So far national insurance has had a very limited application. In practise, as a rule, only certain classes are protected. This, however, is open to the charge of class legislation. A problem that frequently arises is whether or not independent workers should also be insured, but the practical difficulties involved in the calculation of incomes and the greater opportunities presented for malingering have stood in the way of the legislator. All this sort of legislation may be objected to on the ground that it is excessive interference with personal initiative and responsibility. Where thrift is voluntarily exercised by the majority it seems unjust to impose laws designed to meet the needs of a small, thriftless minority. The International Labour Office recognizes this last objection but marches right along with the assumption that social insurance imposed by legislation is the only cure for thriftlessness.

Another problem in social insurance legislation is the matter of benefits. The obvious economic results of the casualties insured against are an increase in medical expenditures and a reduction of the income. The benefits to meet these risks may be equivalent to the economic loss, but this is admitted as purely theoretical. Existing institutions at best provide benefits that cover only a part of the economic loss. Sometimes a minimum of subsistence is established, but this must always be arbitrary. More frequently benefits vary in proportion to the severity of the loss and the amount of the contributions.

The third thing to consider is the sources of the social insurance funds. Is the thing to be paid for out of general taxation or by means of direct contributions? Even the enthusiasts for social insurance favor the contributory idea according to the following quotation: "If every beneficiary himself participates directly in the establishment of the funds required for the payment of his pension (benefit), his right to that pension is psychologically more evident than if he had contributed simply in the form of taxes." (p. 47) And it would be still better if he purchased his insurance voluntarily instead of being forced to it by law. As for the employers, their participation "in the cost of social

insurance is justified not only by their responsibility for the existence of risks, but also by the advantages which they may be expected to derive from such insurance." (p. 52) The International Labour Office finally concludes that the incidence of the cost will ultimately fall in one of two directions, as an increase in commodity prices or else as a decrease in wages.

The various risks may be conveniently classified into three general groups. First of all there are risks of an occupational origin as industrial accidents and occupational diseases. In this field are found compensation acts with optional insurance (most states in the United States); compulsory insurance based on the principle of liability of the individual employer (England and some Australian states); and compulsory insurance based on the principle of collective responsibility of an industry (Germany). Then there are the risks of an economic nature arising out of unemployment. In this type of insurance benefits usually vary according to wages, contributions or conjugal condition, and are paid for from 12 to 26 weeks. Financial responsibility is invariably divided between employers, employes and the state. Finally there are risks of a non-occupational character such as sickness, invalidity, old age and death. In sickness insurance the benefits in Great Britain and Ireland are uniform, but they vary with earnings in every other country. The costs of this kind of insurance are met in various ways; by the insured and the state (Portugal and Roumania); by the workers and employers (Germany and 7 others); by the insured, the employer and the state (Great Britain and Norway); and by the employers alone (Russia). Invalidity, old age and survivors' pensions require a much larger outlay of funds than any of the other forms of social insurance. Costs are generally met in the same way as in sickness insurance, but there are also a number of non-contributory funds whereby the state grants free insurance. It is impossible, of course, adequately to set forth all the features and ramifications of the problems of social insurance, but this will give an inkling of the involved information to be found in the present report.

Recognition must still be given to the problems of unification and coordination. Social insurance has grown and developed in a most conglomerate fashion. Take Germany as an example. In this country a sickness-maternity insurance act was passed



in 1883 covering only industrial wage earners. In 1884 an accident insurance act was passed covering the same class. In 1885 the accident benefits were extended to agricultural workers while the sickness-maternity benefits were extended to commercial wage earners. The agricultural wage earners did not receive benefits for sickness and maternity until 1886. Accident benefits were also extended to seamen in 1887. Thus commercial wage earners are not compensated for accidents and seamen receive no sickness insurance. Not until 1889 did Germany pass legislation covering invalidity and old age and applying in either case only to manual workers. Invalidity benefits were extended in 1911 to non-manual workers and death benefits were granted to the families of manual and non-manual workers. Nothing was done with unemployment until the social assistance law of 1924 was passed. Thus the crazy-quilt of social insurance was created in Germany. Other countries had the same experience. It is this lack of coordination that has given rise to the more recent discussion on unification and coordination.

At present the only unified systems are those of the Serb-Croat-Slovene Kingdom (accident, sickness-maternity, invalidity, old age—death benefits for all wage earners since 1922), Soviet Russia (accident, sickness-maternity, invalidity, old age—death, and unemployment benefits for all wage earners since 1922), and Czechoslovakia (all types of insurance since 1924). In Germany the Imperial Code of 1911 united all legal provisions on insurance into a single text but failed to provide for a concentration of organization into a single system. The following may be quoted from the report in favor of concentration: "When the same institution insures an individual against all the risks administration is simple and less costly, and the social efficiency of the institution is higher." (p. 132) Such an organization, it is claimed, can follow a case from the slightest injury or illness to invalidity, at the same time eliminating all manner of duplicating and overlapping. The only objection is that a state-wide organization may become so excessively centralized or so over-organized that it defeats its own purpose.

As an example of a unified system of social insurance the report of the International Labour Office describes the Russian System.

The social insurance system established by the Russian Labour Code of 1922 does not achieve unity merely in respect of the collection of contribu-

tions and the administration of benefits. The distinction between risks of industrial and non-industrial origin is no longer legally recognized. The same insurance institution covers the risks of temporary and of permanent incapacity, and provides benefits both in cash and in kind. The single insurance institution, which is organized on a territorial basis and possesses a monopoly of insurance, is, as it were, a two-story structure: on the lower floor are the local funds which administer benefits in case of temporary incapacity and benefits in kind, while on the upper floor the regional funds provide benefits of long duration, that is to say, payable to permanent invalids and the survivors of deceased insured persons.

Thus in the Russian system a high degree of unification has been accomplished for, though a division subsists in its interior, it is only in order to provide for the varying duration of the consequences of incapacity for work, which is regarded as the sole risk.

With these words the report closes leaving in the mind of the reader this system of social insurance as an ideal.

In the beginning of the report an interesting table appears (pp. xix-xxviii) giving the principal laws on insurance in the various states, their date, and beneficiaries. The laws are grouped under the following heads: those covering (a) accidents, (b) sickness-maternity, (c) invalidity, (d) old age—death (survivors' pensions), and (e) unemployment.

At times the report seems a bit too sketchy and incomplete, but the general outline is so clear that no one can mistake the direction which this type of insurance is taking. The ideal is to bring the business of protection more and more under the complete control and monopoly of the state. Those who favor social insurance will consequently find some valuable aid here in clarifying their minds, while the adherents of private insurance are presented with a target at which to direct more vigorous and intelligent attacks. Much will naturally depend on personal preference for either state control of insurance or voluntary and private enterprises.

WILLIAM B. BAILEY

*Sickness Insurance.* International Labour Office, Studies and Reports, Series M, No. 4, Geneva, 1925. Pp. viii, 133.

*Unemployment Insurance.* International Labour Office, Studies and Reports, Series C, No. 10, Geneva, 1925. Pp. 134.

The American social insurance movement which began in 1911 within the field of workmen's compensation, and showed such

remarkable progress from 1911 to 1916, suffered almost a complete breakdown as a result of the war. The movement for social health insurance, which became active through state commissions and public agitation in 1916, has never been revived to any large extent. Only recently considerable agitation has developed in the fields of unemployment insurance and old-age pensions, manifesting itself in legislation and investigating commissions.

The tremendous development of workmen's compensation from 1911 on, and its importance for the insurance business and American industry as well as for the general economic and social conditions of the country, is an indication of the far reaching effects of the social insurance program for any industrial country. 10 years ago, these effects were fully appreciated in the United States as was shown by the flood of books, articles, and reports in which the possible effects of social insurance on American industry were always examined in the light of European precedents. But since the war there has been almost a total discontinuance of experts' studies of this character. As a result, even the students find it difficult to follow up the latest developments in the various branches of social insurance outside of the United States. The writer has come across a text book on economics by one of the leading professors in this country published in 1925 and containing a chapter on social insurance in which the information is brought down only to 1920, and nothing is said to indicate the progress of social insurance during the last five years.

For this reason the two reports above listed are of very great importance to actuaries and students of insurance, whether they be in favor of or opposed to the social insurance movement. The information they contain could only be gathered by an American student from the fragmentary reports contained in the *Monthly Labor Review*, published by the United States Bureau of Labor Statistics. But scattered as such information is in hundreds of issues, it is not only difficult to obtain but also fails to give a composite picture such as the two reports readily furnished. Of these two reports, the first appears in a series of social insurance publications of which other issues are of equal interest and importance such as the first, "General Problems of Social Insurance"; the second, "Compensation for Industrial

Accidents"; the third, "Compensation for Occupation Diseases", etc. The second report, which really belongs in the same series, for some reason has been classified under another series dealing with unemployment. Classification does present complicated problems. On the same basis the question might arise whether a study of accident compensation should appear under the series dealing with social insurance or the series dealing with accidents.

This, however, is a matter of very little importance. What is important is the competent treatment of social insurance problems not only in these reports but also in the *International Labor Review* published monthly by the same office, which at present is the best and most reliable source of information. Organizations and publications dealing with labor problems internationally were known in Europe even before the war, but the additional advantage of the International Labor Office publications from the point of the American student is the fact that they appear in English as well as other languages, and perhaps it is only proper to say here that both the *Review*, and the reports can be easily obtained from the American Correspondent of the International Labor Office, Mr. Leifur Magnusson, 1523 L St., Washington, D. C.

Official reports of this character and dealing with such vital problems have both their advantages and disadvantages. The obvious advantage is the reliability of information furnished. Presumably reports are prepared for the International Labor Office by competent men, without excessive hurry, and the statements are properly checked up so that they may be accepted as authoritative and accurate, while in the case of a private study, no matter by how competent a man, there seldom can be positive certainty as to that. On the other hand the obvious disadvantages are perhaps the self-imposed limitations as to expression or opinion or judgment or even as to a marshalling of facts upon which the leader might build his opinion or judgment. Government reports may therefore frequently be described as emasculated.

American state reports do not as a rule suffer from this fault to the same degree. They are often prepared in response to a demand for an opinion and a decision. They are meant to serve as guide, and when, as usually happens, commissions are not unanimous, the reports as such have the additional advantage of

presenting both sides of the controversy. Witness, for instance, as a very eloquent illustration, the latest report on old-age pensions in Massachusetts. The reports of the United States, particularly those dealing with labor and social problems are a good deal more reserved and non-committal; more factual than analytic or even argumentative.

The International Labor Office is of course even in a very much more delicate, diplomatic position. It is true that in the earlier report on "General Problems of Social Insurance" the anonymous author has somewhat deviated from this course of non-committal aloofness but the two reports herewith listed are altogether "proper" and objective. However, if they are to be judged by what they contain rather than by what they omit, both are extremely useful. To most American readers they will appear startling by furnishing evidence that the brief period after the war has resulted in more new social insurance legislation than the three decades preceding the war. That is true, not only of sickness insurance but even more so of unemployment insurance. In fact, it is only since the war that unemployment insurance may be said to have become a world movement rather than an isolated British experiment.

As indicated in the titles, both reports are limited to analyses of legislation. There is very little historic interpretation, only six introductory pages in each report being devoted to a brief historic review. There is absolutely no information of a statistical character in regard to the actual results of legislation which in some countries has been in force for thirty or forty years; nor is there any effort to describe the actual organization which frequently deviates considerably from the printed word of the law, nor is there and, perhaps considering the character of the office, can there be any effort at critical valuation of the laws and results of their application. In other words, no student in the field of social insurance, whether he be an actuary or sociologist, need feel that the existence of these official studies must prevent him from entering this fruitful field of investigation. On the contrary, he should only be stimulated because of the assistance these reports and articles published by the same office will give him in furnishing the necessary legislative material.

The methods of both studies are to be commended. Instead of separate analysis of each act, individual chapters treat of specific

aspects of legislation. These divisions are competently conceived. The sickness insurance report consists of four parts dealing with the scope, institutions, benefits, and financing respectively. The unemployment insurance report consists of five chapters dealing with the scope, definitions of unemployment, rate of benefits, financial organization, and administration and insurance respectively.

It thus appears that the arrangement of the two reports is not quite uniform, which may be due to the fact that they have been prepared by different experts. Both reports are anonymous as appears to be the tradition of the International Labor Office.

Why this should be so is not quite obvious to the reviewer. A student in the field naturally knows or should know the names of all other experts in the same field. He usually develops a certain confidence and regard for certain permanent workers in his field, and I believe it would considerably increase the value of the studies if he knew by whom they were prepared. This is particularly true and important in the case of the first study on "General Problems of Social Insurance" in which there is a wider field for difference of opinions. But even in a purely objective study of legislation, various problems of interpretation arise in which the personality of the interpreter is not without significance. The *International Labor Review* published by the same office does state the names of the authors of various articles. Many of these articles are published and sold separately. It is difficult to see why a different treatment should be accorded to such studies which have previously appeared in the *Review* and others which appear as "studies and reports". One may, of course, surmise that these anonymous authors are probably taken from the same group which contributes to the *Review*, but under the circumstances one is left guessing. One guess, one may venture, that these reports have been prepared in some other language and translated into English, for surely the English, though grammatical and faultless does not strike the reader as idiomatic, and the long sentences raise the suspicion of German origin. The one fault to be found with this is not on account of thoroughness of treatment but a certain unfortunate obscurity and dullness of presentation. With all that, these reports as well as all others in the same series are absolutely indispensable to every actuary in the field of social insurance. I. M. RUBINOW

*Report on Old-Age Pensions.* Commission on Pensions. Wright and Potter Printing Co., Boston, 1925. Pp. 280.

The Commission on Pensions which made this report was apparently charged with the responsibility of learning, and reporting to the Legislature, all that could be learned on the subject of pensions and on the matter of poor relief, public aid, etc., and to make recommendations as a result of its study.

The Commission submitted a "preliminary report" February 14, 1925, (printed as Senate 340, 1925), covering the subjects of "pensions for public employees, for teachers and for veterans in the public service". The Report under review, referred to as the "concluding report", "is devoted almost wholly to the subject of old-age pensions".

This Report is in three Sections, followed by eight appendices.

Section I presents an itemized list of the problems, and distinct phases thereof, referred to the Commission, summarizes the plan and methods followed in the investigation, and presents the conclusions and recommendations of the majority and those of the minority, together with the laws proposed by each to carry out their recommendations.

Section II, which comprises the larger part of the publication presents the results of the data gathered by the Commission applying to the "aged population of Massachusetts."

Section III presents the financial aspects of the problem.

The eight appendices give accounts of the pension systems in Massachusetts, in other states and in foreign countries, and descriptions of other forms of provision such as life insurance and old-age protection through single-premium annuities, etc.

The chapter summarizing the plans and methods of the investigation, comprising only four pages, serves to show in rather an adroit way, though possibly unintentionally so, the stupendousness of the task, especially to such readers as might not have been impressed by the detail outlined in the Resolve or in the first chapter of the Report. It also indicates how wisely and practically the Commission proceeded in its work, such as making detailed investigations only in representative cities or towns, the results of which could be used as the bases of calculations and conclusions applying to the whole state. The Commission avoided spending much time or attention on phases which it

found could have no material bearing on the final conclusions and recommendations.

The Commission's field agents personally interviewed about 9% of the total population in the state aged 65 years and over, so that out of the total population of approximately 225,000 persons of those ages, the agents personally talked with about 19,000, in more than ten cities or parts thereof, and in twenty-three towns. Through overseers of the poor, alms-house officials, and officers of private charities and the like, "detailed information was secured concerning some 12,300 aged persons who received aid in some material form during the year ending March 23, 1924." That the investigations were tactfully conducted is indicated by the modest statement, in the form of a tribute to those interviewed:

Almost invariably the persons interviewed by the field agents sent out by the Commission were courteous and gave full information to the best of their ability. As much can be said, generally, of the officers who dispense public and private charity.

The "generally" is significant in the reading, though possibly not intended so in the writing. It would have been more than could have been expected to have found all such "officers" willing, or even able, to cooperate in such an investigation.

The Majority Report, recommending a system of old-age pensions, was signed by Minnie R. Dwight, Charles J. Mahoney and Royal Robbins, and the Minority Report, recommending against such old-age pensions, by Frank H. Hardison and Allyn A. Young.

Both "conclusions" are characterized by moderate and temperate statements; all of the members seemingly being aware of the probable errors necessarily involved in the data used, and of the unlikelihood that the adoption of their recommendations would solve the problem once and for all.

As is so often the case, the natural sympathies, or the sympathies developed by training and environment, are apparently more controlling in the conclusions reached than the particular evidence studied. In this case, the five members studied the same material, with presumably the same degree of intent to base their conclusions entirely on the material before them, but the only major conclusion in which the five agreed was that something should be done for the aged poor; the conclusions as to the remedies to be applied are far at variance.



The majority, in its conclusions, emphasizes the relative number of the aged who have little or no income, showing that of those interviewed aged 65 and over, 23% had incomes of less than \$100 per year, of whom 73% had no income at all, and of those interviewed aged 70 and over, 29% had incomes of less than \$100 per year, of whom 73% had no incomes at all.

. . . these facts show a state of need among the aged population of Massachusetts far beyond what had been anticipated or is realized by the general public. They seem clearly to call for a general and well-organized system of relief or assistance on the part of the State as a sign of the determination of the community to protect its aged citizens from the extreme hardships which so largely now overwhelm them in old age, and to obviate the fear of the stigma of pauperism which under present conditions is shown strikingly by these figures, and which forms a large part of the life of a considerable proportion of the population as their earning power decreases and finally vanishes. We conceive that the obligation to avert this condition of affairs in old age rests upon the Commonwealth and upon its population as a whole; and we therefore recommend the adoption in Massachusetts of a comprehensive system of old-age assistance, so administered by a central authority, with widespread local aid, as to give adequate protection to the aged people who are in extreme need, without using any such machinery as might in public estimation throw a shadow of pauperism over the beneficiaries.

. . . We have felt that in Massachusetts the smallest weekly payment which would be adequate under American conditions to the situation of the indigent elderly people would be the sum of \$7.00 a week, which we have accordingly recommended as the maximum amount of old-age assistance in the legislation we propose. The bill confines the assistance paid by the State to those persons over 70 years of age who have property not exceeding \$3,000, or an annual income not exceeding \$365.

The proposed law prescribes other qualifications, such as United States citizenship and residence in the state for a minimum period of years, and excludes from its benefit inmates of any prison, jail, insane asylum, etc., at the time of making application; or any who had been imprisoned within ten years previous for offences of specified seriousness, and those who within one year preceding had been professional tramps or beggars.

The majority estimates that the net cost of the proposed old-age assistance would be about \$5,500,000 per year after eliminating those who could be supported by their children and after deducting the saving on account of public outdoor and indoor relief which would be eliminated under the proposed system.

To produce the revenue for the proposed system the majority

recommends a new poll tax of \$2 to be paid by men and women alike and that one-half of one percent be added to the state tax now levied on incomes. These proposals are intended to meet the majority's view that it "seemed highly desirable that the cost should be spread impartially over the various elements of the community." It is estimated that these two taxes would yield about \$6,000,000 yearly.

The majority very frankly says that it cannot foretell "to what extent the outlay will vary in succeeding years or over a long period in the future" especially because of the possible changes in future legislation liberalizing the conditions and benefits. The members of the Commission were apparently well aware of the experience of public employees' pension systems, which have never been allowed opportunity to work out according to the original intent or law, but are subject to perennial tinkering.

The act proposed is clear and unambiguous, and apparently complete in detail, creating a Division of Old-Age Assistance in the Department of Public Welfare.

There is to be no "contractual" relation between the State and the "old-age pensioner;" that is carefully guarded against in Section 28, as follows:

All assistance granted under this act shall be deemed to be granted and to be held subject to the provisions of any amending or repealing act that may hereafter be passed, and no recipient shall have any claim for compensation, or otherwise, by reason of his assistance being affected in any way by such amending or repealing act.

Presumably this is only a necessary cautionary measure, though possibly one to make it somewhat more palatable for the legislature to which presented.

The minority report is considerably longer than the majority's because it is, in a sense, a brief replying to the majority report and a presentation of its own arguments. The substance of the minority's conclusions is shown by the two opening paragraphs of its Report, reading as follows:

We are unable to concur in the recommendation of the majority of the Commission that the Commonwealth establish and maintain a system of non-contributory old-age pensions. Our dissent is not prompted by any lack of sympathy with the general purpose of such a plan as the majority proposes. Nor does it come from any failure to appreciate the importance of the problem with which the majority's plan is intended

to cope. It is based, instead, upon our conviction that a general system of old-age pensions does not constitute a desirable method of achieving that purpose or of meeting that problem.

In what follows we explain our objections to old-age pensions and outline what appears to us to be both a more effective and a more economical way of making adequate provision for the needs of the aged poor. It is necessary in the first place, however, to deal with certain fairly common misconceptions respecting the nature of old-age pensions and respecting the grounds upon which the case for old-age pensions, or for similar payments from the public treasury, must rest.

To the reviewer, the "Conclusions" or "Recommendations" of the minority seem to be the more logical sequel to the data presented. Here again, however, natural sympathies, or those developed by training and environment, may be controlling. Nevertheless, even the majority of the Commission presented no evidence that the sum of \$7.00 a week would alleviate the conditions of a large number of aged dependents. The minority points out that there would be no relief to many of the aged poor to have what would provide only the mere means of existence; it would no more alleviate keen mental suffering than would commitment to some alms-house or other institution. It contends that the use of the word "pension" does not supplant "the stigma of pauperism."

According to the minority, "the problem of the aged poor is not a new problem. It is as old as human civilization. There are some, however, who contend that the problem has become aggravated in modern times." "Doubtless there are many individual cases, or even groups of cases, which could be cited in support of these charges. And yet there is no reliable evidence that, on the average, workers lose their power to make an income at earlier ages than in previous periods of the world's history." "But in one respect, probably, the lot of the aged has changed for the worse. Populations are more mobile." "At the point at which individual earning ability fails and family care is not available, private charity and public aid have to be enlisted. The questions are whether the State should assume an increased share of responsibility, and, if so, in what manner should the State discharge that responsibility." "It is fruitless to try to approach these questions by attempting to determine to what extent society, and to what extent the individual is to be blamed for the poverty which prevails among the aged. Any thoughtful

study of the statistics that are brought together elsewhere in this report is bound to lead to the conclusion that the causes of old-age dependency are multifarious and complex."

"In any event, the problem is not to apportion blame or to contrive a system of rewards and punishment, and if it were, old-age would not be the point at which to begin." "Most people, we believe, are willing that the State should, in fact, assume an increased measure of responsibility for the care of the aged; that aged persons should not suffer for the want of the reasonable requirements of a decent existence; that they should have the medical or other personal care that they may happen to need, and that the provision made for their wants should be sufficiently certain and dependable to free them from unnecessary anxiety with respect to the future."

The minority's objections to the remedy proposed by the majority are on account of its inelasticity and inadequacy to meet individual needs; administrative difficulties; discouragement of savings by people who manage to get together and cling to small sums as a help in old age; the "means qualifications," which has proven unsatisfactory where attempted; adopting a non-contributory system would probably hinder the general development of contributory social insurance; the expense being highly problematical, because the doles would be given into the hands of incompetent persons who had never previously shown ability to spend money wisely, and future legislatures will probably lower the age limit and provide larger allowances.

The purpose of the act proposed by the minority is stated as follows:

The Department of Public Welfare, . . . shall supervise the measures taken by town boards of public welfare or town boards having similiar functions, hereinafter called boards, for the care of needy aged citizens, to the end that they may receive suitable and dignified care in their old-age and that uniformity of treatment of aged citizens according to their needs and circumstances may prevail throughout the State.

The proposed law follows the view of the minority expressed in the following:

The problem being one of poor relief, we have sought to find a way in which our existing systems of poor relief might be utilized and built upon, so that it would not be necessary to set up a separate and competing system. Furthermore, believing that the problem is complex, we have not tried to formulate any blanket prescription. The important thing,

in our view of the matter, is the individual case, and there is no one remedy which is best for all cases.

It is apparent, particularly from Section II of the Report, that Massachusetts has gone a long way in unifying poor relief by state aid to the municipalities which submit to the state requirements. Though the Commission presents some evidence that some of the towns or other municipalities have woefully inadequate provision for the poor and needy, the situation is much better throughout the state than in the states where the state authorities have no corresponding direct supervision.

The material in Section II should prove of much interest and value to students of social conditions; the many tabulations or tables showing the numbers of aged people in different circumstances. It gives data separately for males and females. It shows the occupations of persons at the time of the investigation or at the time of admittance to institutions, and the former occupations; data as to impairment and causes of impairment; data as to nationality and citizenship; groupings as to number of children living, life insurance carried, and other evidences of thrift.

In Section III are shown the bases and assumptions underlying the several calculations made for determining the cost of old-age pensions. The bases as presented seem sound, though being in the form of a report of results, such detail is not given as will permit a mathematician or an actuary to determine that the various factors and functions had been properly employed. From the general character of the matter, however, the technical reader receives the impression that the Commission had employed the data in the best possible way. Without more detail than that given, or than would have been practical to give, it is not possible to work directly from the data given in Section II to that given in Section III.

The appendices sketch the efforts that have been made throughout the world for meeting the problems of old-age, and show that there is much groping in the dark. Each such publication as this will prove to be of much interest and value, but it is questionable whether it points clearly to old-age pensions as the solution.

A report of this kind cannot be read, without many thoughts flying through the mind of the reader as to the whole social

problem. In private industry the provision for superannuation is largely prompted by practical considerations, even though in some cases there are elements of liberality and generosity. In public old-age pensions, however, the particular element is that of sentiment. If practical considerations were to govern exclusively, the only consideration would be that of cost and material effects on the community.

If the granting of old-age pensions is to be on the basis of dependency and length of residence or citizenship, it cannot be considered as a reward for past services to the community. Such a system would give benefits to many who had rendered no real service.

Though the Report shows that a considerable part of the old-age dependency is due to impaired health, resulting either from accident or disease, there is no reference to workmen's compensation and its possible effect in the future. It is conceivable, of course, that workmen's compensation benefits will in the future reduce the relative number of old-age dependents.

Neither is there any direct reference to the possibility that the granting of benefits to old persons who have children presumably able to contribute to their support will prove a strong temptation for some children to procure the weekly dole from the State, though not "needed." The expense of investigating such cases will probably prove quite considerable, and at best the State will grant benefits to many elderly persons who have children able to support them.

There is also another element in connection with the support by children, and that is the viewpoint that, apart from all filial affection, children have no inherent responsibility for the support of their parents, because they had no voice in their own coming into the world; that all the responsibility lies from the parent to the child and none from the child to the parent. This viewpoint, of course, will not meet with general approval, but it is quite a proper viewpoint for those who contend that there is value to the State in an increased population, and therefore State responsibility to its individual members. Proceeding along this line of thought will soon involve us in an analysis of the responsibility of the State to its members and the members to the State, and whether an increased population is of real value to the State or

whether it is not of more value in satisfying the vanity of certain members of the State.

All in all, the "Report on Old-Age Pensions" by the Massachusetts Commission on Pensions is rich meat for students of economics and sociology. That the matter presented by the Commission was too rich for consumption and digestion at one sitting is indicated by the fact that the legislature to which it was presented voted to refer it to the next annual session.

WILLIAM BREIBY

*Statistical Analysis.* Edmund E. Day. The Macmillan Co., New York, 1925. Pp. xxvii, 459.

In general, the texts on statistics recently published may be divided into two groups; the first and largest group written by young men with no experience in the teaching or practice of statistics, texts resembling a hasty expansion of some student's notebook, the second and much smaller group prepared by teachers of long experience or by seasoned and discriminating practitioners. Professor Day's book may be classed with the second group. Throughout the book there is evidence of real experience with students and of wide contact with statistical method and subject matter. In breadth of illustrative material the book resembles Professor Chaddock's recent work; in its cautions to the unwary it has some of the characteristics of Professor Mills' text. Throughout the text one detects a spirit of tolerance for the student unprepared for exacting, rigorous mathematical analysis, who must handle data which do not require much more than common sense in their interpretation.

Professor Day makes no extravagant claims for the few analytical procedures which can be taught to the average student of the social sciences; in fact, the cautions scattered throughout the book may serve to stimulate many a student to enter a real apprenticeship in the mathematical disciplines which constitute the furniture of the mind for the mature analyst. Dr. Day's book bears the same relation to a text for practicing statisticians that Mr. Henry Moir's "Life Assurance Primer" or the Yale Readings in Insurance hold to the Institute of Actuaries' text book and the other advanced readings for actuarial students. Many a man has been attracted to the actuarial profession through a course

in elementary actuarial methods, labeled as such; and so, it is hoped that the few recent texts by really qualified teachers of statistics may attract others to proceed through Yule to the more advanced but indispensable disciplines of Pierson, Knibbs, Charlier and others.

In the introductory chapter on the significance of statistics, Professor Day might supplement his definition of statistics (page 2) "statistics may be said to consist of those methods of investigation peculiar to the collection, tabulation and analysis of quantitative data" by adding the words "relating to groups of persons, things or events." It should be recalled that by far the greater number of applications of devices in the calculus of observations are made to quantitative data which can by no means be catalogued as "statistics;" for instance, the vast display of non-statistical data in a text such as Mellor's "Mathematics for Students of Chemistry and Physics." "Statistical method" is simply the relatively small group of expedients in a broader calculus of observations which apply to data on groups, masses or aggregations. Some teachers of statistical method insist that the student shall have had the broader discipline of the physics or engineering laboratory before essaying the venture into a specialized case of the general method. Practicing statisticians, who do their own teaching, report more satisfying results with students having had rigorous training in laboratories of physical science than with students who have had to supplement courses in elementary statistical method by further training in mathematics.

Professor Day, however, clearly points the way for this latter group of candidates for real proficiency in statistics. This text is not likely to increase the already abundant supply of statistical chiropractors or cultists. May we liken Professor Day's text to a sound treatise on physiology and hygiene for lay persons but not designed to train physicians? How many doctors are there who were first led to study medicine through contact with a well-tempered text on elementary physiology?

Chapters II to V are adequate discussions of variables and statistical units, original statistical observation, classification and the formation of series, and of classifications not in serial form. It might be well to add to the footnote on page 70 a



note on Charlier's formula for determining class limits.\* In Chapter IX, the student's interest would be broadened if Prof. Day were to observe (page 118) that the four distinct contour-types of frequency curves therein defined are those encountered in Pierson's system of analysis and that other important classings have been made by the Scandinavian School.† For the student with preparation in collegiate mathematics, Professor Day might want to preface his discussion of symmetrical distributions by setting out another chapter or chapters on permutations and combinations, and on *a priori* probabilities, somewhat in the manner of Professor Pearl's "Medical Statistics and Biometry." Much of the matter on pages 121-124 would be clarified, and the student would be intrigued possibly into continuing his essential studies, especially in the field of *a posteriori* probabilities. This additional matter would provide a basis for a new chapter on measures of dependability for the statistical constants discussed in Professor Day's Chapter X, XI, XII, XVII and XX; in fact it might become clear that Chapter XX should be deleted.

On page 193, a little more emphasis could be placed on the nature, significance and criteria for linearity of correlation scatters. This could be worked into a discussion of the regression coefficient and an explanation of the meaning of the constants in the equation for the straight line  $y = mx + b$ . In fact, Chapter XIII could open with a consideration of the much more significant regression coefficient, a practice adopted by D. Caradog Jones in his effective text. A graphical cut such as shown in Rugg's "Statistical Methods Applied to Education," introducing the correlation coefficient, would be helpful. On pages 198 and 205, it might have been well to show Charlier's scheme for calculating the correlation coefficient, a more condensed and workable plan than that shown in the present text. The moving average device shown on page 204 could have been introduced in the earlier chapter on frequency series as a help to the student in typing contours.

The chapter on the nature of time series is much more reserved

\*Charlier, C. V. L. "Vorlesungen über die Grundzüge der Mathematischen Statistik," p. 16. Lund, 1920

†Fisher, Arne. "Frequency Curves and their Application to the Construction of Life Tables," Macmillan, 1922. also, Charlier, *op. cit.*

in tone than are the discussions usually presented in elementary texts. The long-time trends in time series are called *evolutionary* movements. Perhaps this is not the right adjective, because an evolutionary movement has one attribute among others, *irreversibility*, and this is not true of many time series.‡ Definitions (2) and (3) on page 235 could be reframed so as to cover (a) systematic and (b) aberrant periodicity, bringing into a sub-definition of (a) the idea of secular change in this characteristic.

Item (4) on page 235, *episodic* movements is a wholesome addition to the inadequate list of internal characters of time series usually given in statistical texts. Perhaps Professor Day may wish to add comment on criteria for explosive or catastrophic items in time series—the criteria of Peirce, Chauvenet, Tchebycheff or Pearl.

In Chapter XVI it might be helpful if some elementary, but sound, comment were added on the growth concept, thus whetting the student's appetite for further inquiry into logistic curves and into growth phenomena generally. Some excellent teaching material can be secured from the Pearl-Parker essays on *Drosophila*.

In Chapter XVII, straight lines are fitted to items in time series by the method of moments. Would it not be well to show an elementary development of the method of least squares, using on *one* time series successively a straight line fit to original items, a straight line fit to logarithms, a common parabola and perhaps a logarithmic parabola? (Pearl's "Medical Statistics and Biometry,") It might facilitate the student's choice of curves if a chapter were added on the rudiments of finite differences.

The chapter on seasonal variation is devoted largely to a discussion of the rather expensive Persons method. Why not offer the less tedious methods, Macauley's, for instance, and say that no one scheme so far devised is wholly satisfactory because distortions due to paucity of data result in more considerable error than does choice of method? Before being used to "eliminate" seasonal tendency, a series of indexes ought to present a smoother line than that shown in the graph on page 298. The

‡Lotka, A. J. "Elements of Physical Biology," p. 24. Williams & Wilkins, Baltimore, 1925.

jagged appearance of most seasonal index graphs ought to suggest that there is still in the index a marked effect of (a) slightly catastrophic items (even if exceptional items have been rejected in accordance with a suitable criterion for rejection) (b) of sheer lack of observations and (c) of accounting and calendar difficulties. The use of medians, inspection judgment, and the indefensible practice of averaging central frequencies (some authors), is oftentimes ineffective. The use of crude seasonal indexes in an attempted elimination of seasonal influence introduces grave error in many instances. It is too much to hope that "seasonal variation, having been accurately measured, may be *eliminated* from the series," when the seasonal index is computed in the manner shown in Professor Day's book and applied directly to trend line items. A little more stress could have been placed upon the importance of detecting by inspection, or otherwise, marked changes in seasonal flow for different zones within the same time series. Chapter XX "Correspondence and Correlation in Time Series" can be omitted for the same reason that partial or net and multiple, correlation were not treated by Professor Day—students without rigorous discipline in the calculus of probabilities are likely to be severely injured through innocent play with powerful and little understood instruments in the manipulation of observations.

On page 369, Professor Day could have quoted considerably more of Professor Pearl's article on the statistical method in nature ("Modes of Research in Genetics.") Or, in lieu of an extensive quotation, the student may be urged to read the whole of Pearl's sound discussion of the nature and aim of statistical processes.

E. W. KOPF

*An Introduction to the Methods of Economic Statistics.* W. Leonard Crum and Alson C. Patton. A. W. Shaw Company, Chicago and New York, 1925. Pp. xii, 493.

This is another book on statistics for the student with meagre mathematical equipment. Elementary algebra, some knowledge of logarithms and of the slide rule are predicated. With this prerequisite the authors assume that study of the text will enable the student to become familiar with statistical processes and to acquire a working knowledge of the limitations on the use of

such processes in economic analysis. That is to say, many hundreds of students who will use this text (and others of like character) will be led to think they know something or will learn to do something without learning why or how they know. It seems that the colleges are destined in the near future to turn out a crop of statistical Meno's slave-boys who "did not know at first, do not know now . . . but then thought that they knew, and answered confidently as if they knew, and had no difficulty."\*

Texts, and the approach to teaching, in our schools of business seem to fall in more and more with the cafeteria plan of dispensing "education," armed with his tray and a handful of spoons, modern youth heads for the dessert counter: marketing, business research, advertising, business cycles, business economics, corporation finance and other light-weight courses. In respect to the "statistics" taught to persons with a reminiscence of elementary algebra, it seems inadvisable to proceed beyond Part I of the Crum-Patton volume (sources, compilation and charting of crude statistical data). Part II, on general analytical methods, gives the student rule-of-thumb control over mere formulae, the confidence and the sort of "knowledge" which Meno's slave-boy had, and leads to the absurd performances catalogued in Section XXIII.

There is no objection to teaching the essentials of descriptive statistics *in the laboratory* or in the office to students with no mathematical background. Such instruction may prepare persons for clerical work in statistical offices, or even for the supervision of clerical processes. But it is highly inadvisable to place in the hands of undisciplined, critically incapable students the sharp-edged formulae of a system of analysis which seasoned mathematical scholars sometimes hesitate to use.

Chapters XX, XXI and XXII in Part III are faithful restatements of the "methods" used by our native Cantabrigians "filled with the spirit and wrapt in a vision prophetic." We are told that there are four elements of time fluctuation: secular trend, seasonal variation, cyclical fluctuation and irregular deviations. Twenty-four pages are devoted to a discussion which leads to the simple clerical trick of fitting a straight line to num-

\*"The Dialogues of Plato," Translated by Benjamin Jowett, Vol. I, p. 259. Scribner's, New York, 1885.

bers in time-series. In a short closing section of Chapter XX, the student is introduced to curvilinear trends, with a reference to the "compound interest law" and to the parabola. This student of ours with a background of elementary algebra is supposed to know what a parabola is, why it is used, and how fitted to data. Why not add the Verhulst-Pearl growth curve? After having mastered Chapter XX the student is supposed to know how to "eliminate" secular trend. "Elimination" seems to be the order of the day; so the student is introduced in Chapter XXI to fourteen pages of words on the link, median-link and chain relative system of computing adjusted series of indexes of seasonal variation. Then without any caution whatever on the insecure and highly disturbed nature of such crudely determined "indexes," the student is told how to "eliminate" or *correct* for seasonal variation. Subtraction of the seasonal index for the average month from the "percent ratio of actual item to the ordinate of trend for a specified month" is supposed to give values corrected for trend and seasonal fluctuation. These values, graphed, are then said to represent the cyclical movement, including the irregular deviations. Chapter XXII, on cyclical fluctuations brings in the additional procedure of reducing swing-tendency or amplitude by dividing each item in the so-called cycle series by the standard deviation of the series. The book closes with a description of forecasting technique, the mechanical use of the correlation coefficient and a display of further incautious remarks on forecasting sequences and the alleged nature of such sequences.

In closing the book, one wonders whether the student has become familiar with statistical processes and whether he has acquired a working knowledge of the limitations on the use of such processes in economic analyses. One thing is certain: some three sessions a week for two semesters have been wasted. Why not devote this time to a course in Hall and Stevens "Euclid;" that and not "statistics" should follow elementary algebra!

E. W. KOPF

*A First Course in Statistical Method.* G. Irving Gavett.  
McGraw-Hill Book Company, New York, 1925. Pp. vi, 358.

This book was written by a mathematician to serve as a text-

book for a foundation course in statistical method for various departments interested—Mathematics, Business Administration, Sociology, Psychology, Commercial Engineering, Fisheries, and the Natural Sciences—at the University of Washington.

There are several promising things about the appearance of the book. Perhaps the most important is that it puts up the subject squarely to the student without trying to dodge elementary, that is, first year, college mathematics. Even the fundamental notions of the calculus are used and an appendix added to stimulate the inquiring mind. At no point in this book is any "No knowledge of mathematics is required" soothing syrup administered. Three dimensional co-ordinates, partial derivatives, conditions necessary for maximum and minimum, with application to the theory of regression in correlation, the notion of integration with its geometric meaning, are presented without apology and help to make the student an "interpreter of" rather than a "substituter in" his formulas. The author has made some concessions to the non-mathematical school of statisticians, undoubtedly with regret, by inserting a few pages of pie percentage, diagrams, pictograms, and the like, properly belonging to the nursery and kindergarten.

The eleven chapters have to deal with tabulation, frequency distribution, averages, dispersion, skewness, probable error, curve fitting, correlation, logarithmic graphical representation and index numbers. Four appendices of about fifty pages explain some of the more useful developments for elementary mathematical statistics in logarithms, permutations, combinations, binomial expansion, probability and the calculus. The book is particularly rich in well chosen examples—twenty to thirty—at the end of each chapter. They are taken from various fields—temperature, precipitation, heights and weights, education, automobile statistics, random sampling of leaf measurements, vital and census statistics, coin tossing, monthly sales, and so on. The student is directed to gather his own samples in many instances and to determine the statistical constants and interpret the results.

The book is peculiarly free from padding and wordy discussions of simple ideas. The introduction is unique in giving in advance a terse description of variables, averages, dispersion, sampling, deviations, correlation and the like, in the first ten pages. The

chapter closes with five tables of live data which are made the basis of sixteen examples which should make the course a winner from the start.

The chapters on averages, dispersion, skewness, probable error, curve fitting and correlation bear evidence of class room experience. They are not tediously long, do not avoid the appropriate mathematical treatment, are free from the usual misconceptions and blunders of writers who essay to teach the foundations of statistics, that is, *mathematical statistics*, without mathematics.

The subject of correlation is made very real by actual sampling and measurements (lengths and breadths) of leaves. The meaning of various degrees of correlation and the connection with probability is well brought out in a series of scatter diagrams based on coin tossing. Pearson's correlation ration and its use in the measure of departure from linear regression are explained in this chapter.

In the chapter of logarithmic graphical representation the author treats briefly such notions as organic growth curves, saturation point, trend lines, moving averages and forecasting with illustrative examples from automobile industry statistics.

The chapter on index numbers is a brief resumé of Fisher's work on this subject.

For use in beginning classes in mathematical statistics in colleges (sophomores or juniors) this is undoubtedly the best text-book which has appeared to date.

JAMES W. GLOVER

*An Introduction to Statistical Methods.* (Revised Edition).

Horace Secrist. The Macmillan Co., New York, 1925. Pp. xxxiii, 584.

This is a revised and enlarged edition of a text book for college students but is intended also as a manual for statisticians and business executives. As regards college students, the book conforms in its general outlines to the books of Jerome, Kelly and others. It rests upon the wrongful conception that mathematics applied to statistics are useful for the essential purposes for which statistics are collected and adapted to a large variety of everyday problems. Statistics plus mathematics imply a broadening in scope and utility of fundamental data insufficient

for the purpose unless amplified by the law of probability and other mathematical principles however strictly limited in their application. Mathematics plus statistics is a misconception of the intrinsic purposes of statistical data and the results in most cases are a serious disappointment. Students are everywhere taught by the latter method in which mathematics are over-emphasized while the fundamental necessities of statistical inquiries are neglected. It is, therefore, a mistake to imply that such a work as the "Introduction to Statistical Methods" can be of much practical service to statisticians and business executives. Anyone who has occasion to make use of statistical publications on a small or a large scale will search in vain for the slightest evidence that the immense amount of teaching in mathematical statistics has had any effect whatsoever in modifying statistical methods for practical purposes.

Those who have nothing else to do but speculate in mathematical statistics and write learned papers which fill transactions of scientific societies may derive pleasure from their achievements which, however, fall upon barren ground. The real student of statistics is concerned with the science of collective phenomena as so admirably set forth many years ago by Ernst G. F. Gryzanovski, in a monograph published by the American Economic Association. Likewise those who wish thoroughly to comprehend the proper purposes and limitations of everyday statistics will find a clear exposition in Meitzen's "History, Theory and Technique of Statistics" translated by Prof. Roland P. Falkner for the American Academy of Political and Social Science in 1891. There is the most urgent need for a work on statistics which will emphasize the fundamentals of, 1st, the fact finding process, 2nd, the best practical and commonsense methods of tabulation and 3rd, the urgency of a qualified, impartial and useful analysis. The difficulty with the mathematician is that he tries to eliminate the law of large numbers by the application of the law of probability. But large numbers are essential in all statistics if statistical science is not to be made ridiculous. Most persons employed in statistical work have not, and do not need a knowledge of higher mathematics. There is nothing more tragic than to force college students into elaborate courses of mathematical statistics with the practical certainty that their arduous intellectual efforts will never be utilized in actual practice.



The method pursued by Dr. Secrist does not aid very materially in the elucidation of practical statistical problems. Any problems or questions which are not practical yield no earning power to those who are concerned with them. The statistician who compiles business statistics, commodity statistics or vital statistics needs to realize first of all the fundamental nature of collective phenomena and the arduous labor required in the collection of statistical facts. The development of the fact-finding sense is of vastly more importance in statistics than the development of the mathematical sense which leads largely into a realm of conjecture.

In statistics there is the utmost urgency for condensation and for a development of a power of brief generalization. The spinning of fine theories has no place in business statistics which are, broadly speaking, merely an approximation to the probable truth, and not a refined scientific process aiming at absurd exactitude. No one has better emphasized the non-utility of mathematics for such purposes than Sir William Hamilton in his lectures of nearly a century ago.

From the mathematical-statistical point of view the work of Professor Secrist conforms to other works of a similar nature and no doubt is useful for the purpose. It will be useful in limited directions, particularly for teaching purposes. But the object of education is not to make more teachers but to develop the judgment of men concerned with everyday practical affairs. There has been a tremendous development of recent years in the application of statistical methods to business forecasting, most of which, if not all of which, rests upon false assumptions. It is assumed that business is subject to the same fundamental laws as physics or chemistry, but it is not. The most elaborate forecasts fail whenever the unavoidable changes in human affairs throw speculative arguments into the discard. Nothing is more important in statistics than humility and the recognition of the truth that all statistics represent but an approximation to the probable state of facts. The appearance of certainty implied in mathematical statistics only makes confusion worse confounded. The very terminology which has been invented primarily for teaching purposes intensifies the existing state of confusion. It is a pitiful thing continuously to meet graduates of courses in statistics who cannot find employment or an opportun-

ity to use their knowledge to some practical purpose. Business rests upon its own laws and its own needs, and is but a process of continuous adjustment and readjustment to the flow in the tide of human affairs. Statistics can aid the business man or the statesman in countless ways, but they can never take the place of independence of judgment based upon a clear grasp of all the factors that require consideration. In the judgment of the reviewer, there is need for a type of text book on statistics totally different from those which have been brought out by the score during recent years.

FREDERICK L. HOFFMAN

*Mathematics of Finance.* Lloyd L. Smail. McGraw-Hill Book Company, New York, 1925, Pp. xv., 310.

The preface of this book contains a frank statement to the effect that the text is intended for college students offering one year's work in high school algebra; the idea evidently being to offer a course in Mathematics of Finance instead of the usual first year college mathematics. This of necessity compels the author to use the inductive method; as the underlying mathematical theory must be developed as the occasion arises.

A wealth of explanatory material appears throughout the 224 pages of the text; very simple, and in some cases almost naive statements are used to develop the theory. Nearly all of the examples and illustrations introduce formulas and tabular solutions; and it is to be feared that the resulting tendency on the part of the average student will be to memorize the formulas instead of learning fundamental principles. It is quite likely that a problem will be solved in terms of "sinking fund factor; use table five;—subtract rate;—and multiply," rather than in terms of the underlying theory.

Before leaving the subject of formulas it might be mentioned that no mean array of them appear. Part Four contains 26 pages and 277 numbered formulas. Some 223 of these are listed in connection with the practical problems of interest and annuities. The balance is for varying annuities and topics from the algebra, no resumé of life insurance formulas being included.

In fact, the subject of insurance receives a very scant treatment. Probability and mortality tables, life annuities, net premiums and reserves are covered (including problems) in 17

pages. The only reserve developed is the terminal reserve on an ordinary life policy.

The usual subjects included in a course of this nature are presented and there can be no doubt as to the completeness of the text. Throughout the chapters, however, the emphasis seems to be placed on a working formula—a method “to get” an answer rather than on theory.

FLOYD E. YOUNG

*A Graphic Table Combining Logarithms and Anti-Logarithms.*  
Andrein Lacroix and Charles L. Ragot. The Macmillan Company, New York, 1925. Pp. ix, 46.

The five-place table contained in this book combines in one graphic scale all five-place numbers and all five-place logarithms, either one of which can be read directly in terms of the other, without interpolation. The simplicity with which it is read, the elimination of the auxiliary tables of proportional parts, and above all, the accuracy of the results obtained, make this graphic table more convenient, more rapid and reliable than all other forms of logarithm tables. As to compactness, it may be of interest to point out that an ordinary table giving, for direct reading without interpolation, all that is embodied in this graphic table of 40 pages, would require 380 pages. The graphic table represents, therefore, an actual saving of nearly 80% in space.

The above is quoted from the Preface because it epitomizes the advantages of this collection of tables.

Each page of the tables consists of two marginal columns and twenty-five parallel lines arranged horizontally across the page. Each of the lines represents a base line for two sets of graduations. The set of graduations appearing on the top of the line is constructed to a numerical scale; and a logarithmic scale is used in graduating the set appearing below the line. The two being in juxtaposition it is possible to read a value on either scale in terms of the other without interpolation. The first two or leading digits for both the numbers and logarithms appear in marginal columns headed N and L respectively. The remaining digits are determined by reading the value of one scale in terms of the other as outlined above. The phrase “remaining digits” is used because three are read directly and anyone familiar with the principle of the slide rule, or who has used the table for a short time, would have no trouble in estimating another digit with a high degree of accuracy.

The five-place table, as previously mentioned, occupies only forty pages, the remaining six pages being devoted to a four-place graphic table.

The tables are convenient, rapid and reliable.

FLOYD E. YOUNG

*The Aetna-izer Supplements 1920-1924.* Aetna Life Insurance Co., Hartford, 1926. Pp. vi, 439.

This publication is comprised of reprints of a series of supplements to the "Aetna-izer" (a monthly publication devoted to Aetna casualty, surety, fire, marine and miscellaneous lines) issued during the years 1920-1924 inclusive. The subject matter of the supplements divides itself into two groups, (1) supplements which furnish information of a general technical character on casualty, surety, fire, marine and miscellaneous lines of insurance, and (2) supplements which provide selling suggestions and information of a character which is of particular interest to producers. The following titles of the more important supplements comprising the two groups give an indication of the wide range of subjects discussed:

(1)	(2)
Fidelity Bonds	Letters as an aid in Selling Accident & Health Insurance
Personal Effects Floater and Tourists' Baggage Insurance	Opportunities and Responsibilities of the Multiple Line Agent
Engine Breakage Insurance	Analysis as a Basis for Successful Soliciting
Public Liability Insurance	Premium Collections
Burglary Insurance	System As an Income Builder
Contract Bonds	Selling Talks on Burglary Insurance
Fire, Use & Occupancy, Rent and Leasehold, Tornado and Wind-storm Insurance	Lapses and How to Reduce them
Ocean Marine Insurance	Advertising
Electrical Machinery Insurance	
Combination Residence Insurance	
Riot, Insurrection, Civil Commotion, and Explosion Insurance	
Inland Marine Insurance	
Group Disability Insurance	
Druggists' Liability and Hospital Liability Insurance	
Personal Accident and Health Insurance	
Plate Glass Insurance	
Bailees' Customers Insurance	
Depository Bonds	
Water Damage and Sprinkler Leakage Insurance	
Parcel Post Insurance	
Automobile Insurance	
Check Alteration and Forgery Insurance	
Transportation Insurance	

The make-up of the articles for the most part follows a definite scheme whereby the subject matter is divided into sections for which suitable headings and sub-headings are provided. Liberal use is made of marginal notes which state in a few words the nature of the information discussed in each paragraph or group of paragraphs. This scheme serves not only to make the publication one of interest, but adds materially to its value as a reference work.

Information such as the following is in general presented in the supplements dealing with discussions on particular lines of insurance—definition of the line of insurance, the basic coverage, policy exclusions, policy limits, basis of premium charge, methods of computing rates and premiums, underwriting rules both general and special, information concerning the hazards insured against, the nature and amounts of claims which may be involved and information of a detailed or general nature presented to assist the agent in selling the coverage to prospective policyholders and to guard against the writing of undesirable risks. The type of information presented in the supplements dealing with agency suggestions and production methods depends naturally upon the particular subjects discussed. The business getting hints are stated in a clear-cut, straight-forward manner and should prove of valuable assistance not only to the young and inexperienced producers but also to those who have been engaged in the business for many years.

A fundamental defect in the treatment of the material is the failure to adopt a uniform method of presentation. The topics discussed and the order of their presentation are not always the same for each line of insurance. Considerable improvement could be effected if all of the technical matter were included in the first part of each supplement, if the topics discussed were the same for each line of insurance whenever possible, if the order of presentation of the topics were uniform, and if all discussion relating to production features were included in the second part of the supplement. The supplements are probably designed to assist company agents and other field representatives in the first instance, but their educational value for students is also an important consideration and the arrangement above suggested would make for a more valuable composite publication to serve as a text or reference book.

The supplements dealing with specific lines of insurance cover the essential points in a fairly complete manner, but a certain unevenness exists which could be remedied easily through use of a uniform synopsis or outline of the material to be discussed. Such outlines assist materially in presenting technical information in a clear and uniform manner and in making such information available for ready reference. The use of highly technical language has been avoided wherever possible and through liberal use of examples and a popular style interest is added to otherwise "dry" subjects.

M. ACKER

*Everyman's Insurance.* Frazer Hood. D. Appleton & Co., New York, 1925. Pp. vii, 264.

Frazer Hood, Professor of Psychology in Davidson College, prefaces his book on "Everyman's Insurance" with the following words, "The business of insurance in the United States has assumed such large proportions both in respect to the multiplicity of its forms and the number of those who avail themselves of its protection, that the time seems ripe for a volume that will give the information desired in an untechnical phraseology." There is probably no other economic factor in private or business life having such far reaching importance and at the same time receiving such casual consideration as the subject of insurance. Most people, whether in their personal affairs or as executives of commercial enterprises look upon insurance as a necessary evil imposed upon them either by a sense of duty or by the requirements of contractual or financial obligations.

This book is not intended for the technical student but for the ordinary buyer of insurance as well as the agent in small communities desiring a primer on the subject to assist him in understanding the fundamental principles of the business.

The book is divided into three parts with a preliminary chapter on "The Meaning of Insurance." Part I, comprising six chapters and consuming 106 pages out of the total of 259, is devoted to what may be called a narrative explanation of the various types, uses and principles of Life Insurance. Under "Family Uses of Life Insurance," short paragraphs deal successively with the providing of benefits to the family of the assured in full amount or in annuities, protecting mortgages and debts,

providing for education, estate taxes and charitable bequests. Under "Business Uses of Life Insurance," separate paragraphs indicate what lives in a business should be covered for the protection of partners, stockholders, bond issues, contingent interests and contractual liabilities. A chapter on the "Nature and Principles of Life Insurance" gives an outline of the method of calculating premiums, reserves, dividends and cash and loan values. Ch. 5, on "Types of Policies and Plans of Insurance," explains the difference between mutual and stock Companies and the difference between whole life, limited payment life, endowment and term policies; deferred survivorship and annuities and total disability policies. It also discusses briefly fraternal and assessment plans. "Group Insurance of Employees" includes the advantages of group or wholesale insurance, with items on the methods of payment of premium, computing the amount to be paid and factors influencing the cost. "Disability Insurance," written independently of life policies covering total disability, deals with the subject of accident policies and combination accident and health policies. This chapter contains a very useful paragraph on "What to Look for in a Disability Clause."

Part II condenses into 67 pages the entire subject of "Fire and Marine Insurance," subdivided into 4 chapters, one of which, in 15 pages, outlines the broad, involved and highly specialized field of marine insurance, which is further treated in detail in Chapter 11.

A chapter on the "General Principles of Fire Insurance," devotes about 10 pages to the similarities and dissimilarities of fire and life insurance, three pages to the co-insurance clause but nothing to the mortgagee and other important clauses necessary to offset the numerous restrictions contained in the 200 lines of the fine print on the inside of a standard fire insurance policy. These points, however, are taken up in detail under the policy contract in the next chapter. Under the heading of "Rates" a short narrative description of the five main factors in basic rates is given and the general principles of schedule rating are set forth so that the assured as well as the broker or agent may consider a fire schedule with some degree of intelligent understanding. The policy contract is discussed, with a very useful paragraph on "Insurable Interest," enumerating the various classes of persons whose interests in a property may be the subject of insurance.

"Other Insurance" and concurrency of forms are also well treated. The chapter on "Insurance Organization" defines stock companies, mutuals, reciprocals or interinsurers, Lloyds and self-insurance. It also differentiates between agents and brokers and their respective duties and relationships to the companies and to the assured. "Marine Insurance" receives a very understandable diagnosis and explanation, especially in the paragraphs on general and particular average and on kinds of policies. Builder's risk and protection and indemnity insurance are made clear in less than one page. Cargo and freight policies are defined and inland marine, including parcel post insurance are covered in this very useful chapter.

Part III is devoted to "Miscellaneous Forms" and contains three chapters, the first of which comprises 20 pages covering the very broad subject of liability and workmen's compensation insurance. The second chapter of 22 pages covers miscellaneous property and liabilities such as automobile, fidelity and surety bonds, civil commotion and credit insurance. The third, also devoted to miscellaneous insurance, treats of burglary and theft, explosion, use and occupancy, sprinkler leakage, plate glass, weather and live stock insurance. "Liability and Workmen's Compensation Insurance" is the title of a chapter which treats not only the employer's liability to his own employees, but to those of others with whom he may have contractual relations, and also the liability of any property owner to those members of the public to whom he does not stand in the relation of employer or contractor. Not only is workmen's compensation insurance readably explained but the liability for personal injuries and property damage caused by the operation of elevators or the maintenance of property is well defined. "Miscellaneous Property Insurance" covers the five types of automobile insurance; *viz.*, public liability, property damage, collision, theft, fire and transportation, all in 5 short and easily understood paragraphs. The usual forms of suretyship are defined but nothing is said of their uses and the method of determining the premiums. Title insurance and credit insurance, both fairly recent and not well understood forms are clearly explained in their fundamental aspects. The final chapter covers "Other Miscellaneous Forms" not previously described, including burglary and theft, together with the related coverages of paymaster, messenger, office, safe



and mercantile stock robbery. Other subjects treated are damage to boilers and machinery, and damage caused by boiler and machinery; explosion insurance as distinguished from the bursting of wheels; weather insurance, including windstorm, hail, earthquake and rain coverages under the various forms known as dwelling, farm, builder's risk and mercantile property. Rain insurance against anticipated monetary losses resulting from ordinary rainfall is well explained. The subdivision on use and occupancy insurance, which in the reviewer's opinion should have been made part of the chapter on fire insurance, also defines leasehold and rent insurance. Sprinkler leakage is also explained in this chapter, but should also be added to the fire insurance section of this work. Plate glass insurance is well explained in one page. Riot and civil commotion insurance is also made clear on one page of this book and another page on live stock insurance completes the subject matter treated in this remarkable little publication.

The author states in his preface that the book is suited to the needs of the agent in small communities who desires to understand the fundamental principles of his business. The reviewer, however, believes that this limitation should be deleted from the preface and takes a real pleasure in commending the book, which is well condensed, to every broker, agent and insurance company official who wants a compact, ably prepared and easily understood symposium of every ordinary form of insurance. It unquestionably merits its title of "Everyman's Insurance."

ECKFORD C. DEKAY

## CURRENT NOTES

S. D. PINNEY, CURRENT NOTES EDITOR

## "VOLUNTARY" AUTOMOBILE INSURANCE

The disadvantages of such a compulsory automobile liability law as that which becomes effective in Massachusetts on January 1, 1927, have been pointed out by some of the leading insurance officials and a substitute plan has been suggested which it is believed would prove more satisfactory. This plan would make the law voluntary instead of compulsory by furnishing an adequate incentive to provide proof of financial responsibility. This would be accomplished by placing a legal penalty upon the automobile owner who was unable to pay the damages resulting from an accident for which he might be held responsible.

The plan provides for a preliminary hearing which may be either an independent proceeding or a part of an action by the injured person to recover damages. After an accident occurs, if the defendant owner or operator is not already insured, the injured party brings the proceeding really in the nature of what is known to lawyers as a motion for a special precept of attachment. The court makes an inquiry into the facts of the particular accident to find out whether the defendant who caused the accident was really to blame for it. If he is found not at fault, the case ends at once. On the other hand, if the court finds that the defendant was to blame, by judicial decree or otherwise as a result of court action, the defendant, if the operator, may not thereafter operate any automobile on the highways of the state, and if the defendant be the owner, he may not use his automobile on the highways until he has put up, within the limits of \$5,000 for that particular case, such security as the court thinks is proper to insure the injured person for the judgment he may later get.

An important part of such a plan is that the law would provide that a liability policy with \$5,000-\$10,000 limits in any of the existing forms taken out by the man before the accident, covering the particular accident would suffice as security.

## SOCIAL INSURANCE IN GERMANY

According to recent reports, German industrial conditions are very unsatisfactory, largely because prices are so high that the country cannot sell things abroad. One of the chief reasons for these high prices is the social welfare laws which forced employers and workers to pay \$631,000,000 in 1925 for alleged welfare benefits, while the entire exports of the country for that year were only \$1,581,000,000.

The radical interests which have been in control of the republic since the war have further extended these schemes, with a very great increase in cost, most of which goes to pay salaries and other red-tape expenses connected with government operation of the insurance schemes, as compared with benefits paid to the workers. A German clerk earning \$30 a month must spend three per cent of his salary for national insurance, his employer being required to pay the same amount for him, while they share in addition three per cent for unemployment and accident insurance and four per cent on compensation insurance. This means that the worker pays \$5.50 a month out of a salary of \$30, in addition to his income tax, and after paying these charges to the government he can look forward to receiving a pension of from \$6.25 to \$7.50 a month after he has reached the age of 65.

## ANNUAL STATEMENT BLANKS

Several interesting changes in the annual statement blanks have been recommended by the Convention of Insurance Commissioners which will become effective this year. One change is made in the list of side lines on which the fire companies are required to make a separate report of their premiums and losses. This is the substitution of earthquake for aircraft, the reason given being that few companies now write aircraft insurance, while a number of them are writing earthquake business.

A change is made in the form of the underwriting exhibit, under which the profit and loss items are segregated at the bottom of the exhibit, in order to show more clearly the results from underwriting. In the investment exhibit the items have been rearranged in order to show more clearly the results from investments by deducting investment expenses from interest and net

earned and by segregating profit and loss items at the bottom of the exhibit.

Several additional interrogatories of considerable interest have been added to the mutual fire blank. One is the inquiry:

"Does the company issue any policy under which the policyholder is not liable to assessments?" It is explained that under the laws of at least one state, foreign fire mutuals may issue policies of this sort provided they maintain deposits of at least \$200,000 in their home state. It is considered desirable to have the information which will be developed by this interrogatory, so that the department affected may know whether foreign fire mutuals are complying with this statutory provision."

Other questions added are:

"What interest, direct or indirect, has this company in the capital stock or guaranty capital of any other insurance company? Is a majority of the guaranty capital of this company owned or controlled directly or indirectly, by any other corporation?"

"Does the company issue both participating and nonparticipating policies on separate classes of risks? If so, state the classes of risks and the amount of premiums in force on each class of both participating and nonparticipating policies."

This last question is also required to be answered by all classes of casualty companies, both stock and mutual.

In the casualty company blank, where a showing has been required heretofore as to the amount of the special reserve for unpaid liability and workmen's compensation losses, the item is divided so as to require a separate showing as to reserves for liability losses and for workmen's compensation losses. This change is made in order to make it possible to obtain from the insurance department reports the losses incurred for liability and the losses incurred for workmen's compensation separately, and to figure the loss ratio for each of these two classes. It is held that they are entirely dissimilar reserves and should therefore be shown separately. They are now shown separately in Schedule P. The premium exhibit is rearranged so as to eliminate duplication, by listing all of the classes written in the first column, with a column for the different classes of information required on each line. The underwriting and investment exhibits are also rearranged in the same manner as in the fire company blank.

### JUDGMENT INDEMNITY COVERAGE

A new form of insurance coverage has been issued recently which is, in fact, a judgment indemnity insurance policy. The purpose of the policy is to meet the demand for compulsory automobile insurance without the need of legislative compulsion by guarantying to the policyholder that any judgment obtained against a third party arising out of the ownership, maintenance or use of any automobile, motor truck or motorcycle will be paid. This would meet the chief objection to the present situation throughout the country, that of financial irresponsibility on the part of countless automobile owners. Anyone who wishes to be assured of recovery in the event of a claim, can guarantee that recovery through this policy. Furthermore, the policy does not relieve the automobile owner, against whom any judgment may be secured, of any legal liability. It merely indemnifies the claimant and continues to hold over the head of the automobile owner the full judgment as a charge against future earnings or acquisition of property. It is, therefore, looked on as a stimulus towards greater care in the future operation of automobiles which has been another argument for compulsory automobile insurance in many places.

In summarizing this coverage it should be pointed out that many claims for damages arising from automobile accidents have been dropped in the past and no recoveries sought, because it was realized that a judgment if obtained would be unenforceable. This judgment indemnity policy enables the policyholder to recover on any judgment up to the policy limit and eliminates the question of financial responsibility and the question of existence or nonexistence of insurance by the persons responsible for the accident. There is another feature in the policy, which is included in what is called the "arbitration clause." Should arbitration appear to be the obvious ultimate recourse, the necessity for a trial in a lower court might be avoided and the arbitration be resorted to as a primary means of adjustment. Except in connection with arbitration, the insurance company would take no part in the adjustment of claims. It will neither prosecute nor defend, but will merely offer indemnity after the claimant has taken the necessary legal steps.

## ASSOCIATION OF CASUALTY COMPANY PRESIDENTS

At the present time there is considerable interest in the formation of an association of casualty company presidents similar to the association of life insurance presidents which celebrates its twentieth anniversary this year. In preparing for this step the casualty executives are studying the organization and accomplishments of the life association.

"Taking the mystery out of life insurance" has been called the chief result of the life presidents' association's work since its organization twenty years ago. Probably the most important place, outside of the public at large, where this mystification in connection with the business has been removed has been in state and national legislative bodies.

The life presidents' association has also accomplished a great deal with respect to promoting economy and reducing expenses in the matter of general administration by an interchange of views on practice among life insurance companies. Naturally, this saving appeals to casualty executives who hope to reduce the expenses of casualty insurance by means of a similar organization.

It is in the functions which would be analogous to those of the life presidents that the chief concern of casualty executives is centered. An official of the life presidents' association has summarized these activities as follows:

"Insurance reserves and resources have been an impenetrable mystery to many and there have been frequent accusations that they are controlled by Wall Street. Continual publications of the latest trend of life insurance investments over a series of years have almost eradicated this charge since statistics show that the most distant corners of the United States are being built up by insurance funds. Investment figures are now requested for use in governmental bulletins, showing the current economic condition of the country. Publication of the character and number of death claims have promoted interest in public health and prevention of accidents.

"Dispelling the mystery among legislative bodies has been a big problem. Their personnel is constantly changing and few, if any, specialists in insurance are ever elected. It has therefore become the duty, as well as the protective necessity, of insurance companies to keep legislators informed on questions involved.

In taxation questions alone the association has more than justified its existence in money saving from defeat of bills which offered a good chance of becoming laws until their inconsistencies were pointed out by association representatives.

"Publication and prompt distribution of laws which have been passed has been another important function of the Association and one which has been highly appreciated by its membership."

### SICKNESS BENEFIT FUNDS IN SWEDEN

The Swedish Sick-Benefit funds are regulated by and receive subsidies from the State through the act of July 4, 1910 and the decrees of June 30, 1913 and October 11, 1920. One of the divisions of the social board registers and supervises the sick funds and distributes the Government subsidies.

In case of sickness, members receive either hospital, medical, and pharmaceutical treatment, or a cash payment varying from 0.90 to 8 *kronor*. (*Krona* at par—26.8 cents; exchange rate approximately at par.) The cash payment is not granted unless the sickness lasts more than three days. Death benefits, which may not exceed 500 *kronor*, may be paid in addition to sickness and maternity benefits. The assessments of the members must be fixed in advance, but additional contributions may be required if the receipts of the fund do not cover the expenditures. No one is allowed to hold membership in more than one sick fund, but there are supplementary funds which pay benefits to members of sick funds who have exhausted their rights to benefits from that source.

The social board has recently published a bulletin giving statistics on the operation of the sick funds during the years 1922-1924. These statistics are briefly summarized below:

The number of Swedish registered sick funds steadily increased from 221 in 1892 to 2,424 in 1909. Beginning with 1910 the number of funds has decreased considerably, by the end of 1924 the number of registered funds being only 1,264, or about half the number registered in 1909. The total membership of the funds, however, steadily increased from year to year, with the exception of 1911, 1915 and 1921, when there were slight decreases. In

1924 the average membership of the sick funds was 768,040, as compared with 742,365 in 1923, with 728,004 in 1922, and with 24,735 in 1892. In 1920 the year of the last Swedish population census, 17.2 per cent of the total population over 15 years of age was insured against sickness. Of the total sick fund membership in 1924, 490,588 or 63.9 per cent, were males, and 277,452, or 36.1 per cent, were females. Of the ordinary sick funds in existence in 1924, 1,056 insured both men and women, 163 men only and 31 women only.

In addition to the ordinary sick funds there were, in 1924, 33 supplementary funds with a membership of 89,342.

In 1924, 1,165 funds insured their members against both sickness and death, and 99 against sickness only. According to the law governing sick funds, those funds which grant death benefits only cannot be registered. This does not, however, prevent funds which insure against both sickness and death from paying death benefits only to certain members. In 1924, 618,521 members were insured against both sickness and death, and 130,086 against sickness only, and 19,433 against death only.

That part of the report under review which deals with morbidity statistics covers only those cases of sickness for which a pecuniary benefit was granted. In 1924 the ordinary sick funds compensated 237,873 cases of sickness of an average duration of 26.3 days per case. The corresponding figures for 1923 were 210,238 and 27.3. The supplementary funds compensated in 1924, 2,246 cases of sickness of an average duration of 71.8 days per case, as against 2,075 cases of an average duration of 70.8 days in 1923. In the ordinary sick funds the average duration of sickness per case in 1924 was 23.8 days for men and 32.4 days for women, as against 24.9 and 33.1 days, respectively, in 1923.

Of the registered sick funds in 1924, 486 provided maternity benefits for their female members. These funds had 213,944 female members and compensated 9,356 cases of confinement of an average duration of 29.1 days per case.

The net assets of both ordinary and supplementary sick funds combined amounted in 1922 to 23,807,069 *kronor*, in 1923 to 26,451,487 *kronor*, and in 1924 to 29,132,735 *kronor*, or on an average to 29.48, 32, and 33.98 *kronor* per member respectively.



### PENSION PLAN CERTIFICATE

Under a recent amendment to the New York Insurance Law known as Article 6-B persons or corporations may organize or reorganize pension systems subject to the supervision of the Insurance Department. The plan is entirely voluntary; but those systems which are brought under the operations of the law are required to operate under the regulations governing a life insurance company, except that they are confined to the employes of the one corporation, that they operate without profit and that they are managed by the corporations and the employes. Advantages accruing from the change are that the pension system is placed on a sound actuarial basis, that periodical examinations by the department are required, that the funds of the system are separated from those of the corporation and that the employes retain title to such parts of their salaries as they contribute to the pension fund regardless of the length of time they remain in the employ of the corporation.

### COMPENSATION EXPENSE LOADING

In connection with a hearing on Minnesota rates the question of expense loading was brought up by a representative of the Minnesota employers. It was the contention of this representative that the inspection, audit, and adjustment expense should be considered purely as a state expense rather than upon a nationwide basis. In a brief filed by the insurance companies in refutation of this argument it was pointed out that no system can be devised under which in the policy year there can be an exact balance of the premium income on one side against the losses and expenses on the other. There must be a variation one way or the other. The effort, therefore, is directed to the end of providing the carrier with such a reasonable and adequate income as will maintain its solvency and assure the protection which the employer pays for and which the employe is entitled to receive. To effect and preserve such a status of the insurance carrier and at the same time to protect the employer against exorbitant or unreasonable insurance premium rates, and to provide uniformity thereof under compulsory insurance laws, the rate making boards were created. After several years of experience and

much intensive scientific study, the principle has been adopted of erecting a rate structure on the basis of 60% of the premiums to cover losses, and 40% to cover expenses.

An effort has been made in some instances to localize the rate structure to a particular state where such localization would benefit the employers of that state, and on the other hand to predicate the rate on a nation-wide experience where such experience would be more advantageous to the employers of a given state than the local basis. It is recognized, however, that the solvency of the insurance carrier is one of the main factors in determining the rate structure and the principle is now almost uniform that the pure premium, or in other words, the 60 per cent which is available for losses, should be based upon the loss experience of the state, as to those classifications where the volume of business within the state is sufficient to make a fair, reasonable average, but to base the expense loading upon the nation-wide experience because of the impracticability and almost impossibility of accurately allocating the various items of expense to the several states within which an insurance carrier may operate.

Another reason for adopting the estimated expense loading of 40% is the necessity of providing the insurance carrier with means to pay all of its expenses without reference to state lines. Conditions in different localities are constantly arising which affect the business of a company as a whole. During one period the whole amount of premium loading for inspection for instance, may not be required, but during the same period the loading for audit may not suffice. During another period conditions may be reversed. Those are variable quantities, but the average countrywide experience has demonstrated that the loading is necessary.

There is no express or implied agreement by the insurance carriers that the specific percentages allocated in the estimate of expense loading will all be spent in any given policy year, or if any part is saved, that it will accumulate for the benefit of subsequent years, or that it will be used to make good deficiencies that have occurred in prior years. The company has a right in any policy year to use its entire premium income to pay its losses and expenses for such year, without reference to what proportion is paid out for losses or for expenses. The percentages

budgeted for specific expenses in the premium rate structure merely indicate the basis of a company's necessities, and it is not to be held to a hard and fast formula not subject to any deviation; otherwise, a company might have an unavailable surplus in one or more funds, and a shortage or deficiency in another or other funds. To obviate so far as possible such results, the expense loading is based on a national average experience.

Multiple-line all-state insurance carriers find that from an accounting standpoint it is a physical impossibility to analyze accurately their expenses by lines of insurance and then by states. Several state insurance departments have required such an analysis. These departments soon found that this data when obtained was necessarily incomplete and unreliable, and therefore of their own volition have discontinued requesting this state expense analysis.

#### PERSONAL NOTES

S. K. Li is now with the United States Life Insurance Company.

L. Leroy Fitz, formerly Assistant Actuary of the Massachusetts Insurance Department is now Assistant to the Manager of the Insurance Department of the Chamber of Commerce of the United States.

John F. Williams has resigned as Actuary of the Illinois Department of Trade and is now Vice President of the Illinois Life Insurance Company.

Floyd E. Young now has the title of Associate Actuary in the Western Union Life Insurance Company.

Armand Sommer now holds the position of Manager of the Accident and Health Department of the Standard Accident Insurance Company.

G. F. Michelbacher, formerly Secretary-Treasurer of the National Bureau of Casualty & Surety Underwriters is now Vice President and Secretary of the Great American Indemnity Company.

Jacob Malmuth is now Examiner in the New York Insurance Department.

William Newell has been appointed Assistant Secretary of the Sun Indemnity Company.

Hiram O. VanTuyt, formerly with the New York Insurance Department is now Actuary and Statistician of the Constitution Indemnity Company.

Walter G. Voogt previously Comptroller of the California State Compensation Insurance Fund is now Actuary of the New York State Insurance Fund.

William J. Constable, who has been Assistant Secretary of the National Council on Compensation Insurance, has been appointed Secretary of the Massachusetts Automobile Rating & Accident Prevention Bureau.

Harold J. Ginsburgh formerly with the Aetna Life Insurance Company is now connected with the American Mutual Liability Insurance Company of Boston, Massachusetts.

H. P. Stellwagen formerly Manager of the Automobile Department of the National Bureau of Casualty and Surety Underwriters has been elected Secretary-Treasurer of that organization.

# CASUALTY ACTUARIAL SOCIETY

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*\*Terms expire at the annual meeting in November, 1926.*

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

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ABSTRACT FROM THE MINUTES OF THE MEETING  
MAY 21, 1926.

The semi-annual (twenty-sixth regular) meeting of the Casualty Actuarial Society was held at the Hotel Biltmore, New York, on Friday, May 21, 1926.

President Michelbacher called the meeting to order at 10:20 A. M. The roll was called showing the following forty-three Fellows and nineteen Associates present:

FELLOWS

BARBER	GRAHAM, T. B.	MULLANEY
BLANCHARD	GREENE	NICHOLAS
BREIBY	HAMMOND	OTIS
BUCK	HOBBS	PALLAY
BUDLONG	HUNT	PERKINS
COGSWELL	JACKSON, C. W.	PINNEY
CORCORAN	KOPF	RICHARDSON
DEKAY	LAWRENCE	ROEBER
DORWEILER	LESLIE	SENIOR
DUNLAP	LITTLE	SMITH, C. G.
ELSTON	McMANUS	TARBELL
FALLOW	MAYCRINCK	VAN TUYL
FONDILLER	MELTZER	YOUNG, C. N.
GOULD	MICHELBACHER	WOODWARD
	MOORE, G. D.	

ASSOCIATES

CONSTABLE	HALL, L. L.	ROBBINS
CRANE	HULL	SKELDING
DAVIS, E. M.	JONES	SPENCER
FLEMING	LI	STOKE
GILDEA	MATTHEWS	VOOGT
GRAHAM, C. M.	NEWELL	WHEELER
	PIKE	

President Michelbacher read his presidential address.

The minutes of the meeting held November 18, 1925, were approved as printed in the *Proceedings*.

The Secretary-Treasurer read the report of the Council and upon motion, it was adopted by the Society. The Council had adopted certain rules under which in the future only the Committee on Admissions could designate candidates for admission to the Society as Fellows without examination. Applications for

admission as Associates either with or without examination may be submitted, as heretofore, to the Secretary-Treasurer or through any member of the Society.

The reports of the Librarian (Mr. Breiby), of the Educational Committee (Mr. Kopf, Chairman), and of the Examination Committee (Mr. Elston, Chairman) were accepted.

In accordance with the constitutional requirements, notice of the following proposed amendments to the By-Laws was given. These amendments were, on motion, adopted to read as follows:

#### ARTICLE IV—DUES—FIRST PARAGRAPH

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.

#### NEW BY-LAW

#### 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 V—AMENDMENTS

Change Number of Article to read:

#### ARTICLE VI—AMENDMENTS

The papers printed in this Number were read or presented. Recess was taken until 2:15 P. M.

By invitation of the Committee on Program, Mr. H. A. Fortington, Secretary of the Joint Advisory Committee of Finance of the Royal Insurance Company and Affiliated Companies, addressed the Society on "Investments for Casualty Companies", and Mr. Reinhard A. Hohaus, Assistant Actuary of the Metropolitan Life Insurance Company, addressed the Society on "The Function and Future of Industrial Retirement Plans."

The papers read at the last meeting of the Society were discussed.

Upon motion, the meeting adjourned at 5:00 P. M.



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# CASUALTY ACTUARIAL SOCIETY

1926 YEAR BOOK

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Officers, Council and Committees

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List of Ex-Presidents and Ex-Vice-Presidents

List of Deceased Members

List of Students

Constitution and By-Laws

Examination Requirements

1925 Examination Questions

*(Corrected to February 1, 1926)*

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# CASUALTY ACTUARIAL SOCIETY

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NOVEMBER 18, 1925

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†*Ex-Presidents:* ALBERT H. MOWBRAY.....1926  
 HARWOOD E. RYAN.....1927  
 WILLIAM LESLIE.....1928

†*Ex-Vice-Presidents:* LEON S. SENIOR.....1926  
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 EDWIN W. KOPF.....1928  
 JOSEPH H. WOODWARD.....1928  
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\*Terms expire at the annual meeting in November, 1926.

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

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## MEMBERSHIP OF THE SOCIETY, NOVEMBER 18, 1925.

## 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	
†	Amerine, W. M., Assistant Secretary, Georgia Casualty Co., Brown Building, Atlanta, Ga.
May 23, 1924	Bailey, William B., Economist, Travelers Insurance Co., Hartford, Conn.
*Nov. 20, 1924	Barber, Harmon T., Travelers Insurance Co., Hartford, Conn.
†	Benjamin, Roland, Treasurer, Fidelity & Deposit Co., Baltimore, Md.
†	Black, S. Bruce, President, Liberty Mutual Insurance Co., Park Square Building, Boston, Mass.
Apr. 20, 1917	Blanchard, Ralph H., Associate Professor of Insurance, School of Business, Columbia University, New York.
May 24, 1921	Bond, Edward J., First Vice-President, Maryland Casualty Co., Baltimore, Md.
May 19, 1915	Bradshaw, Thomas, General Manager, Massey-Harris Co., Ltd., 915 King St., Toronto, Canada.
†	Breiby, William, Consulting Actuary, Fackler & Breiby, 50 Broad St., New York.
*Oct. 31, 1917	Brockway, U. Hayden, Travelers Insurance Co., Hartford, Conn.
Oct. 22, 1915	Brown, Herbert D., Chief of U. S. Efficiency Bureau, Washington, D. C.
Oct. 22, 1915	Brown, William H., Second Vice-President and Secretary, Columbian National Life Insurance Co., Boston, Mass.
June 5, 1925	Brosmith, William, Vice-President and General Counsel, Travelers Insurance Co., Hartford, Conn.
†	Buck, George B., Consulting Actuary for Pension Funds, 25 Spruce Street, New York.
May 26, 1916	Bucklin, Walter S., President, National Shawmut Bank, 40 Water Street, Boston, Mass.
†	Budlong, W. A., Superintendent of Claims, Commercial Travelers Mutual Accident Association, Utica, N. Y.
Apr. 20, 1917	Burhop, W. H., Assistant Manager, Employers Mutual Liability Insurance Co., Wausau, Wis.
Feb. 19, 1915	Burns, F. Highlands, President, Maryland Casualty Co., Baltimore, Md.
†	Cammack, Edmund E., Vice-President and Actuary, Aetna Life Insurance Co., Hartford, Conn.
†	Carpenter, Raymond V., Actuary, Metropolitan Life Insurance Co., 1 Madison Ave., New York.

## FELLOWS.

Date Admitted	
*Nov. 15, 1918	Coates, Barrett N., Consulting Actuary, 603 Dividend Building, San Francisco, Calif.
*Nov. 17, 1922	Coates, Clarence S., Federal Mutual Liability Insurance Co., Mills Building, San Francisco, Calif.
Oct. 27, 1916	Cogswell, Edmund S., Secretary & Actuary, Commission on Pensions, State House, Boston, Mass.
Feb. 19, 1915	Collins, Henry, Assistant Manager, Ocean Accident & Guarantee Corporation, 1 Park Avenue, New York.
†	Copeland, John A., Consulting Actuary, Southeastern Trust Building, Atlanta, Ga.
*Nov. 18, 1925	Corcoran, William M., Actuary, Connecticut Insurance Department, Hartford, Conn.
†	Cowles, Walter G., Vice-President, Travelers Insurance Co., Hartford, Conn.
†	Craig, James D., Actuary, Metropolitan Life Insurance Co., 1 Madison Ave., New York.
*Nov. 20, 1924	Darkow, Angela C., Independence Indemnity Company, Third and Walnut Streets, Philadelphia, Pa.
†	Dawson, Alfred B., Miles M. Dawson & Son, 36 W. 44th St., New York.
†	Dawson, Miles M., Counsellor at Law and Consulting Actuary, 36 W. 44th St., New York.
†	De Kay, Eckford C., President, De Kay and Co., Insurance Brokers, 51 Maiden Lane, New York.
†	Dearth, Elmer H., Vice-President, Patch & Co., Insurance Counselors, 1220 First National Bank Building, Detroit, Mich.
May 19, 1915	Deutschberger, Samuel, Actuary, New York Insurance Department, 165 Broadway, New York.
*Nov. 17, 1920	Dorweiler, Paul, Aetna Life Insurance Co., Hartford, Conn.
†	Dublin, Louis I., Statistician, Metropolitan Life Insurance Co., 1 Madison Ave., New York.
May 19, 1915	Dunlap, Earl O., Assistant Secretary, Metropolitan Life Insurance Co., 1 Madison Ave., New York.
†	Egbert, Lester D., Director, Brown, Crosby & Co., Inc., Insurance Brokers, 3 S. William St., New York.
*Nov. 17, 1922	Elston, James S., Assistant Actuary, Life Department, Travelers Insurance Co., Hartford, Connecticut.
†	Epsteen, Saul, Denver National Bank, Denver, Colo.
†	Fackler, Edward B., Consulting Actuary, Fackler & Breiby, 50 Broad St., New York.
†	Fallow, Everett S., Actuary, Accident Department, Travelers Insurance Co., Hartford, Conn.
†	Farrer, Henry, Assistant Secretary, Independence Indemnity Co., Third and Walnut Sts., Philadelphia, Pa.
Feb. 19, 1915	Fellows, C. W., President, Associated Industries Insurance Corporation, Wells Fargo Bldg., San Francisco, Calif.
Feb. 19, 1915	Flanigan, James E., Agency Manager, Bankers Life Co., 220 Broadway, New York.
†	Flynn, Benedict D., Secretary, Travelers Insurance Co., Hartford, Conn.

## FELLOWS.

Date Admitted	
Feb. 19, 1915	Fondiller, Richard, Woodward, Fondiller & Ryan, Consulting Actuaries, 75 Fulton St., New York.
	† Forbes, Charles S., Insurance Broker, 68 William St., New York.
May 26, 1916	Frankel, Lee K., Second Vice-President, Metropolitan Life Insurance Co., 1 Madison Ave., New York.
	† Franklin, Charles H., Assistant to Vice-President, Compensation and Liability Department, Continental Casualty Co., 910 South Michigan Ave., Chicago, Ill.
Feb. 25, 1916	Froggatt, Joseph, President, Joseph Froggatt & Co., Insurance Accountants, 25 Church St., New York.
	† Furze, Harry, Treasurer, Globe Indemnity Co., Washington Park, Newark, N. J.
Feb. 19, 1915	Garrison, Fred S., Assistant Secretary, Travelers Indemnity Co., Hartford, Conn.
*Nov. 20, 1924	Ginsburgh, Harold J., Aetna Life Insurance Co., Hartford, Conn.
May 19, 1915	Glover, James W., Professor of Mathematics and Insurance University of Michigan, 620 Oxford Road, Ann Arbor, Mich.
	† Goodwin, Edward S., Goodwin-Beach & Co., Bankers, 720 Main St., Hartford, Conn.
	† Gould, William H., Consulting Actuary, 75 Fulton St., New York.
Oct. 22, 1915	Graham, George, Vice-President, Central States Life Insurance Co., St. Louis, Mo.
Oct. 22, 1915	Graham, Thompson B., Assistant Secretary, Metropolitan Life Insurance Co., 1 Madison Ave., New York.
	† Graham, William J., Second Vice-President, Equitable Life Assurance Society, 393 Seventh Ave., New York.
May 25, 1923	Granville, William A., Educational Director, U. S. National Life & Casualty Co., 513 Aldine Ave., Chicago, Ill.
	† Greene, Winfield W., Actuary and Comptroller, General Re-Insurance Corporation, 80 Maiden Lane, New York.
	† Hamilton, Robert C. L., Comptroller, Hartford Accident & Indemnity Co., Hartford, Conn.
	† Hammond, H. Pierson, Assistant Actuary, Life Department, Travelers Ins. Co., Hartford, Conn.
	† Hansen, Carl M., Vice-President and General Manager, General Re-Insurance Corporation, 80 Maiden Lane, New York.
Oct. 27, 1916	Hardy, Edward R., Assistant Manager, New York Fire Insurance Exchange, 123 William St., New York.
Oct. 22, 1915	Hatch, Leonard W., Director, Bureau of Statistics and Information, State Department of Labor, 124 East 28th St., New York.
Nov. 17, 1920	Heath, Charles E., Chief Examiner of Casualty Companies, New York Insurance Department, 165 Broadway, New York.
Nov. 21, 1919	Henderson, Robert, Second Vice-President and Actuary, Equitable Life Assurance Society, 393 Seventh Ave., New York.
May 17, 1922	Heron, David, Secretary & Chief Statistician, London Guarantee & Accident Co., 20 Lincoln's Inn Fields, London, W. C. 2, England.

## FELLOWS.

Date Admitted		
Oct. 22, 1915		Hess, Herbert, Herbert Hess & Co., Public Insurance Accountants, 120 Broadway, New York.
	†	Hillas, Robert J., President, Fidelity & Casualty Co., 92 Liberty St., New York.
Nov. 15, 1918		Hinsdale, F. W., Secretary, Workmen's Compensation Board, Vancouver, B. C., Canada.
May 23, 1924		Hobbs, Clarence W., Special Representative of the National Convention of Insurance Commissioners, National Council on Compensation Insurance, 151 Fifth Ave., New York.
Oct. 22, 1915		Hodgkins, Lemuel G., Secretary, Massachusetts Protective Association, Worcester, Mass.
	†	Hoffman, Frederick L., Consulting Statistician, Prudential Insurance Co., and Dean, Advanced Course, Babson Institute, Wellesley Hills, Mass.
Oct. 22, 1915		Holland, Charles H., President, Independence Indemnity Co., Third & Walnut Sts., Philadelphia, Pa.
	†	Hughes, Charles, Auditor and Actuary, New York Insurance Department, 165 Broadway, New York.
	†	Hunt, Burritt A., Assistant Secretary, Accident & Liability Department, Aetna Life Insurance Co., Hartford, Conn.
	†	Hunter, Arthur, Chief Actuary, New York Life Insurance Co., 346 Broadway, New York.
Nov. 18, 1921		Hutcheson, William A., Second Vice-President and Actuary, Mutual Life Insurance Co., 32 Nassau St., New York.
Feb. 25, 1916		Jackson, Charles W., Actuary, Postal Life Insurance Co., 511 Fifth Ave., New York.
May 19, 1915		Johnson, William C., Vice-President, Massachusetts Protective Association, Worcester, Mass.
*Nov. 18, 1921		Kearney, Thomas P., Manager, State Compensation Insurance Fund, Denver, Colo.
	†	King, Walter I., Secretary, Group Insurance Department, Connecticut General Life Insurance Co., Hartford, Conn.
*Nov. 21, 1919		Kirkpatrick, A. L., Casualty Information Clearing House, 208 So. La Salle St., Chicago, Ill.
	†	Kopf, Edwin W., Assistant Statistician, Metropolitan Life Insurance Co., 1 Madison Ave., New York.
Feb. 19, 1915		Laird, John M., Secretary, Connecticut General Life Insurance Co., Hartford, Conn.
Feb. 19, 1915		Landis, Abb, Consulting Actuary, 1107 Independent Life Building, Nashville, Tenn.
Nov. 17, 1922		Lawrence, A. R., Special Deputy Commissioner of Banking and Insurance, 92 Washington St., Newark, New Jersey.
	†	Leal, J. R., Secretary & Actuary, Interstate Life and Accident Co., Chattanooga, Tenn.
	†	Leslie, William, General Manager, National Council on Compensation Insurance, 151 Fifth Ave., New York.
*Nov. 20, 1924		Linder, Joseph, Office of Woodward, Fondiller & Ryan, Consulting Actuaries, 75 Fulton St., New York.
Nov. 18, 1921		Little, James F., Associate Actuary, Prudential Insurance Co., Newark, N. J.

## FELLOWS.

Date Admitted	
†	Lockett, Daingerfield G., First Vice-President and General Manager, United States Casualty Co., 80 Maiden Lane, New York.
*Nov. 16, 1923	McClurg, D. Ralph, Secretary and Treasurer, National Equity Life Insurance Company, Little Rock, Ark.
May 23, 1919	McDougald, Alfred, Ellerslie, Beddington Gardens, Wallington Surrey, England.
*Oct. 31, 1917	McManus, Robert J., Assistant Statistician, Compensation and Liability Department, Travelers Insurance Co., Hartford, Conn.
Feb. 19, 1915	Maddrill, James D., Actuary, Hartford Accident and Indemnity Co., 690 Asylum St., Hartford, Conn.
†	Magoun, William N., General Manager, Massachusetts Rating & Inspection Bureau, 80 Broad St., Boston, Mass.
May 19, 1915	Maycrink, Emma C., Examiner, New York Insurance Department, 165 Broadway, New York.
Feb. 19, 1915	Mead, Franklin B., Secretary and Actuary, Lincoln National Life Insurance Co., Fort Wayne, Ind.
Apr. 20, 1917	Meltzer, Marcus, Statistician, National Bureau of Casualty & Surety Underwriters, 120 W. 42nd St., New York.
†	Michelbacher, G. F., Secretary-Treasurer, National Bureau of Casualty & Surety Underwriters, 120 W. 42nd St., New York.
†	Miller, David W., Assistant Treasurer, S. W. Straus & Co., Investment Bonds, 565 Fifth Ave., New York.
†	Milligan, Samuel, Assistant Actuary, Metropolitan Life Insurance Co., 1 Madison Ave., New York.
†	Mitchell, James F., First Assistant U. S. Manager, General Accident Fire and Life Assurance Corporation, 421 Walnut St., Philadelphia, Pa.
†	Moir, Henry, President, United States Life Insurance Co., 105 Fifth Ave., New York.
*Nov. 18, 1921	Montgomery, Victor, Secretary, Pacific Employers Insurance Company, 724 So. Spring St., Los Angeles, Calif.
†	Moore, George D., Assistant Secretary and Actuary, Royal Indemnity Co., 84 William St., New York.
May 19, 1915	Morris, Edward B., Actuary, Life Department, Travelers Insurance Co., Hartford, Conn.
Nov. 21, 1919	Morrison, Charles E., Vice-President and General Manager, Utilities Mutual Insurance Co., 225 West 34th St., New York.
†	Morrison, James, Secretary-Treasurer, Independence Indemnity Co., Third & Walnut Sts., Philadelphia, Pa.
†	Mowbray, Albert H., Consulting Actuary, 1012 Colusa Ave., Berkeley, Calif.; Associate Professor of Insurance, University of California, Berkeley, Calif.
May 20, 1918	Mudgett, Bruce D., Professor of Economics, University of Minnesota, Minneapolis, Minn.
*Nov. 17, 1920	Mueller, Louis H., Treasurer, Associated Industries Insurance Corporation, Wells Fargo Building, San Francisco, Calif.

## FELLOWS.

Date Admitted	
†	Mullaney, Frank R., Actuary and Assistant Secretary, American Mutual Liability Insurance Co., 142 Berkeley St., Boston, Mass.
May 28, 1920	Murphy, Ray D., Second Vice-President and Associate Actuary, Equitable Life Assurance Society, 393 Seventh Ave., New York.
†	Nicholas, Lewis A., Assistant Secretary, Fidelity & Casualty Co., 92 Liberty St., New York.
†	Olfiers, Edward, Consulting Actuary, rua Dos Andradas 64, P. O. Box 1817, Rio-de-Janeiro, Brazil.
†	Orr, Robert K., President, Michigan Employers Casualty Co., Lansing, Mich.
†	Otis, Stanley L., Counsellor at Law, 80 Maiden Lane, New York.
*Nov. 21, 1919	Outwater, Olive E., Actuary, Ladies of the Maccabees, Port Huron, Mich.
†	Pallay, Julius J., Secretary, London Guarantee & Accident Co., Ltd., 55 Fifth Ave., New York.
May 26, 1916	Parker, John M., Jr., Secretary, Accident and Liability Department, Aetna Life Insurance Co., Hartford, Conn.
*Nov. 18, 1921	Perkins, Sanford B., Assistant Secretary, Travelers Insurance Co., Hartford, Conn.
Nov. 15, 1918	Perry, W. T., Assistant Manager, Ocean Accident and Guarantee Corporation, 36 Moorgate, London, E. C. 2, England.
*Nov. 17, 1922	Pinney, Sydney D., Actuary, Compensation and Liability Department, Travelers Insurance Co., Hartford, Conn.
†	Remington, Charles H., Vice-President, Aetna Life Insurance Co., Hartford, Conn.
May 23, 1919	Richardson, Frederick, U. S. Manager, General Accident Fire and Life Assurance Corporation, 421 Walnut St., Philadelphia, Pa.
May 24, 1921	Riegel, Robert, Professor of Insurance, University of Pennsylvania, Philadelphia, Pa.
*Nov. 16, 1923	Roeber, William F., Assistant Actuary, National Council on Compensation Insurance, 151 Fifth Avenue, New York.
†	Rubinow, I. M., Executive Director, Jewish Welfare Society, 330 South Ninth St., Philadelphia, Pa.; Consulting Statistician and Actuary.
†	Ryan, Harwood E., Woodward, Fondiller & Ryan, Consulting Actuaries, 75 Fulton St., New York.
†	Scheitlin, E., Assistant Treasurer, Globe Indemnity Co., Washington Park, Newark, N. J.
†	Senior, Leon S., Manager and Secretary, Compensation Inspection Rating Board, 370 Seventh Ave., New York.
Apr. 20, 1917	Smith, Charles G., Manager, State Insurance Fund, 432 Fourth Avenue, New York.
Feb. 25, 1916	Strong, Wendell M., Associate Actuary, Mutual Life Insurance Co., 32 Nassau St., New York.
Oct. 22, 1915	Strong, William Richard, No. 4 "Sheringham," Cotham Road, Kew, Victoria, Australia.
†	Sullivan, Robert J., Vice-President, Travelers Indemnity Co., Hartford, Conn.
*Nov. 17, 1920	Tarbell, Thomas F., Actuary, Accident and Liability Department, Aetna Life Insurance Co., Hartford, Conn.



## FELLOWS

Date Admitted	
May 19, 1915	Thiselton, Herbert C., 50 Beulah Hill, Norwood, London, S. E. 19, England.
	† Thompson, John S., Assistant Actuary, Mutual Life Insurance Co., 32 Nassau St., New York.
Nov. 18, 1921	Toja, Guido, Royal Commissioner, Government Institute of Insurance, Rome, Italy.
	† Train, John L., Secretary and General Manager, Utica Mutual Insurance Co., 239 Genesee St., Utica, New York.
Nov. 17, 1922	Traversi, Antonio T., Government Insurance Commissioner and Superintendent of National Provident Fund, Box 563, Wellington, New Zealand.
*Nov. 21, 1919	Van Tuyl, Hiram O., Examiner, New York Insurance Department, 165 Broadway, New York.
*Nov. 17, 1920	Waite, Alan W., Aetna Life Insurance Co., Hartford, Conn.
*Nov. 18, 1925	Warren, Lloyd A. H., Assistant Professor of Mathematics, University of Manitoba, Winnipeg, Manitoba, Canada.
May 23, 1919	Welch, Archibald A., President, Phoenix Mutual Life Insurance Co., Hartford, Conn.
	† Whitney, Albert W., Associate General Manager and Actuary, National Bureau of Casualty & Surety Underwriters, 120 West 42nd St., New York.
	† Wolfe, Lee J., Consulting Actuary, 165 Broadway, New York.
	† Wolfe, S. Herbert, Consulting Actuary, 165 Broadway, New York.
May 24, 1921	Wood, Arthur B., Vice-President and Actuary, Sun Life Assurance Company, Montreal, Canada.
	† Woodward, Joseph H., Woodward, Fondiller & Ryan, Consulting Actuaries, 75 Fulton St., New York.
*Nov. 17, 1920	Young, Charles N., Manager, Safety Engineering Department, United States Casualty Co., 80 Maiden Lane, New York.
	† Young, William, Actuary, New York Life Insurance Co., 346 Broadway, New York.

## ASSOCIATES

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

Those marked (1) or (2) have passed Part I or Part II of the Fellowship Examination.

Date Enrolled	
May 23, 1924	Acker, Milton, Manager, Compensation and Liability Department, National Bureau of Casualty and Surety Underwriters, 120 West 42nd St., New York.
*Nov. 15, 1918	Ackerman, Saul B., Assistant Professor of Insurance, New York University, 32 Waverly Place, New York.
*Nov. 15, 1918	Ankers, Robert E., Secretary and Treasurer, Continental Life Insurance Co., District National Bank Building, Washington, D. C.
(1)*Nov.16,1923	Ault, Gilbert E., Office of Woodward, Fondiller & Ryan, Consulting Actuaries, 75 Fulton St., New York.
*Nov. 17, 1922	Barter, John L., Hartford Accident & Indemnity Co., 430 California St., San Francisco, Calif.
*Oct. 31, 1917	Bessey, John M., Nutley, N. J.
*Nov. 18, 1925	Bittel, William H., University of Michigan, 807 So. State Street, Ann Arbor, Mich.
Nov. 17, 1920	Black, Nellas C., Superintendent Statistical Division, Maryland Casualty Co., Baltimore, Md.
*Oct. 22, 1916	Brann, Ralph M., Superintendent Compensation Department, London & Lancashire Indemnity Company of America, 20 Trinity St., Hartford, Conn.
Nov. 15, 1918	Brooks, LeRoy, Statistician, U. S. Fidelity & Guaranty Company, Baltimore, Md.
Nov. 20, 1924	Broughton, Thomas W., Zurich General Accident and Liability Co., 175 W. Jackson Boulevard, Chicago, Ill.
*Nov. 15, 1918	Brunquell, Helmuth G., Actuary, Wisconsin Insurance Department, Madison, Wis.
*Oct. 22, 1915	Buffer, Louis, District Manager, Utica Mutual Insurance Co., 41 East 42nd St., New York.
*Nov. 20, 1924	Bugbee, James M., Rating Engineer, The Associated Companies, 477 Prospect Ave., Hartford, Conn.
Mar. 31, 1920	Burt, Margaret A., Office of George B. Buck, Consulting Actuary, 25 Spruce Street, New York.
Nov. 17, 1922	Cavanaugh, Leo D., Vice-President and Actuary, Federal Life Insurance Co., 166 N. Michigan Boulevard, Chicago, Ill.
(2)*Nov.17,1920	Comstock, W. Phillips, Statistician, London Guarantee and Accident Co., Ltd., 55 Fifth Ave., New York.
*Nov. 18, 1921	Constable, William J., Assistant Secretary, National Council on Compensation Insurance, 151 Fifth Ave., New York.
*Nov. 18, 1925	Crane, Howard G., National Council on Compensation Insurance, 151 Fifth Avenue, New York.
*Nov. 16, 1923	Davis, Evelyn M., Office of Woodward, Fondiller & Ryan, Consulting Actuaries, 75 Fulton St., New York.
*Nov. 18, 1925	Davis, Malvin E., Metropolitan Life Insurance Co., 1 Madison Ave., New York.
May 25, 1923	Economidy, Harilaus E., Assistant Secretary and Comptroller, American Indemnity Co., Galveston, Texas.

## ASSOCIATES.

Date Enrolled	
June 5, 1925	Eger, Frank A., Secretary and Comptroller, Indemnity Insurance Company of North America, Philadelphia, Pa.
Nov. 15, 1918	Egli, W. H., Statistician, Zurich General Accident & Liability Insurance Co., 431 Insurance Exchange, Chicago, Ill.
*Nov. 16, 1923	Fitz, L. Leroy, Assistant Actuary, Massachusetts Insurance Department, State House, Boston, Mass.
*Nov. 16, 1923	Fleming, Frank A., Actuary, American Mutual Alliance, 730 5th Ave., New York.
May 23, 1919	Fletcher, Nicholas, Secretary, Workmen's Compensation Board, Winnipeg, Manitoba, Canada.
*Nov. 18, 1925	Fredrickson, Carl H., Statistician, Canadian Casualty Underwriters Association, 26 Adelaide St., W., Toronto, Canada.
Nov. 20, 1924	Froberg, John, Superintendent, California Inspection Rating Bureau, San Francisco, Calif.
*Nov. 17, 1922	Gibson, Joseph P., Jr., Actuary, Security Mutual Casualty Co., 3236 So. Michigan Ave., Chicago, Ill.
*Nov. 16, 1923	Gildea, James F., Travelers Insurance Co., Hartford, Conn.
*Nov. 17, 1922	Graham, Chas. M., Assistant Actuary, State Insurance Fund, 432 Fourth Avenue, New York.
*Nov. 18, 1921	Haggard, Robert E., Superintendent, Permanent Disability Rating Department Industrial Accident Commission, State Building, Civic Center, San Francisco, Calif.
*Nov. 17, 1922	Hall, Hartwell L., Assistant Actuary, Connecticut Insurance Department, Hartford, Conn.
Nov. 20, 1924	Hall, Leslie L., Secretary, Rating Division, National Council on Compensation Insurance, 151 Fifth Avenue, New York.
*Nov. 18, 1925	Hall, William D., National Bureau of Casualty and Surety Underwriters, 120 West 42nd St., New York.
(4)Mar.25, 1924	Hart, Ward Van Buren, Assistant Actuary, Connecticut General Life Insurance Co., Hartford, Conn.
*Nov. 16, 1923	Haugh, Charles J., Jr., Assistant Actuary, National Bureau of Casualty & Surety Underwriters, 120 West 42nd St., New York.
Nov. 21, 1919	Haydon, George F., General Manager, Wisconsin Compensation Rating & Inspection Bureau, 481 Broadway, Milwaukee, Wis.
Nov. 18, 1921	Hull, Robert S., Travelers Insurance Co., Hartford, Conn.
*Oct. 31, 1917	Jackson, Edward T., Statistician, General Accident Fire & Life Assurance Corporation, 421 Walnut St., Philadelphia, Pa.
(2)*Nov.18,1921	Jensen, Edward S., Great Republic Life Insurance Co., Los Angeles, Calif.
*Nov. 21, 1919	Jones, Loring D., Claim Auditor, State Insurance Fund, 432 Fourth Ave., New York.
(1)*Nov.20,1924	Kelton, William H., Assistant Actuary, Life Department, The Travelers Insurance Company, Hartford, Conn.
*Nov. 17, 1922	Kirk, Carl L., Assistant Statistician, Zurich General Accident & Liability Insurance Co., 431 Insurance Exchange, Chicago, Ill.
*Nov. 18, 1925	Li, Shou-Kun, University of Michigan, 1021 E. Catherine St., Ann Arbor, Mich.
*Nov. 18, 1925	Malmuth, Jacob, New York Insurance Department, 165 Broadway, New York.

## ASSOCIATES.

Date Enrolled	
(2)*Nov.16,1923	Matthews, Arthur N., Travelers Insurance Co., Hartford, Conn.
(4)*Oct.27, 1916	McClure, Laurence H., Colt's Patent Fire Arms Manufacturing Co., Hartford, Conn.
*Nov. 17, 1922	McIver, Roswell A., Actuary, U. S. National Life & Casualty Co., 29 South LaSalle St., Chicago, Ill.
(4)*Nov.17,1922	Michener, Samuel M., Assistant Actuary, Columbus Mutual Life Insurance Co., 580 East Broad St., Columbus, Ohio.
Nov. 17, 1922	Montgomery, John C., Assistant Treasurer, Utilities Mutual Insurance Co., 225 West 34th St., New York.
May 25, 1923	Moore, Joseph P., Vice-President, North American Accident Insurance Company, 275 Craig St. W., Montreal, Canada.
(2)*Nov.21,1919	Mothersill, Roland V., Secretary & Actuary, Compensation Insurance Board, State Capitol, St. Paul, Minn.
(4)*Oct.27,1916	Newell, William, Superintendent Compensation & Liability Department, Sun Indemnity Co., 55 Fifth Ave., New York.
*Nov. 18, 1925	Nicholson, Earl H., Actuarial Department, Lincoln National Life Insurance Company, Ft. Wayne, Ind.
May 23, 1919	Otto, Walter E., Secretary and Treasurer, Michigan Mutual Liability Co., Park Avenue Building, Detroit, Mich.
Nov. 20, 1924	Pennock, Richard M., Actuary, Pennsylvania Manufacturers Association Casualty Insurance Co., Finance Building, Philadelphia, Pa.
*Nov. 17, 1920	Pike, Morris, Examiner, New York Insurance Department, 165 Broadway, New York.
(4)*Nov.17,1922	Poorman, William F., Actuary, Central Life Assurance Society, Fifth and Grand Avenues, Des Moines, Iowa.
(4)Nov.17,1922	Powell, John M., Actuary, Columbian National Life Insurance Co., 77 Franklin St., Boston, Mass.
*Nov. 18, 1925	Prenner, Myron R., Actuary, Department of Insurance, Bismarck, North Dakota.
*Nov. 15, 1918	Raywid, Joseph, Vice-President, Underwriters Statistical Bureau, 81 Fulton St., New York.
(4)*Nov.20,1924	Richter, Otto C., American Telephone & Telegraph Company, 195 Broadway, New York.
*Nov. 21, 1919	Robbins, Rainard B., Assistant Actuary, New York Insurance Department, 165 Broadway, New York.
Nov. 16, 1923	Sawyer, Arthur, Actuary, London Guarantee & Accident Co., 55 Fifth Ave., New York.
*Nov. 20, 1924	Shaw, Victoria E., Michigan Mutual Liability Company, Park Avenue Building, Detroit, Mich.
(4)*Nov.20,1924	Sheppard, Norris E., Lecturer in Mathematics, University of Toronto, Toronto, Canada.
Nov. 15, 1918	Sibley, John L., Statistician, United States Casualty Co., 80 Maiden Lane, New York.
*Nov. 18, 1925	Skelding, Albert Z., National Council on Compensation Insurance, 151 Fifth Avenue, New York.
*Nov. 18, 1921	Smith, Arthur G., Actuary & Auditor, Compensation Inspection Rating Board, 370 Seventh Ave., New York.
*Nov. 18, 1925	Sommer, Armand, Standard Accident Insurance Co., Insurance Exchange, Chicago, Ill.

## ASSOCIATES.

Date Enrolled	
*Nov. 15, 1918	Spencer, Harold S., Aetna Life Insurance Co., Hartford, Conn.
Nov. 20, 1924	Stellwagen, Herbert P., Manager, Automobile Department, National Bureau of Casualty and Surety Underwriters, 120 West 42nd St., New York.
*Nov. 16, 1923	Stoke, Kendrick, National Council on Compensation Insurance, 151 Fifth Ave., New York.
Nov. 15, 1918	Sullivan, Oscar M., Director of Re-education, State Department of Education, St. Paul, Minn.
*Nov. 18, 1925	Tao, Sheng-Han, University of Michigan, 203 South Thayer St., Ann Arbor, Mich.
Mar. 23, 1921	Thompson, Arthur E., Chief Statistician, Globe Indemnity Co., Washington Park, Newark, N. J.
(*)Nov.21,1919	Trench, Frederick H., Manager, Underwriting Department, Utica Mutual Insurance Co., 239 Genesee St., Utica, New York.
*Nov. 20, 1924	Uhl, M. E., National Bureau of Casualty & Surety Underwriters, 120 West 42nd St., New York.
May 25, 1923	Upshur, Arthur B., Actuary, Home Beneficial Association, 900 E. Broad St., Richmond, Va.
May 25, 1923	Vinter, Joseph M., Standard Accident Insurance Co., 640 Temple Ave., Detroit, Mich.
*Nov. 21, 1919	Voogt, Walter G., Comptroller, State Compensation Insurance Fund, State Building, Civic Center, San Francisco, Calif.
(*)Oct.27,1916	Waite, Harry V., Statistician, Compensation & Liability Department, Travelers Insurance Co., Hartford, Conn.
May 23, 1919	Warren, Charles S., Chief Statistician, Ocean Accident & Guarantee Corporation, 1 Park Ave., New York.
Nov. 18, 1925	Washburn, James H., Consulting Actuary, 165 Broadway, New York.
(*)Nov.18,1921	Waters, Leland L., Actuary, National Accident Insurance Co., Lincoln, Neb.
Nov. 17, 1920	Watson, James J., Assistant Secretary and Business Administrator, Michigan Mutual Liability Company, Detroit, Mich.
*Nov. 18, 1921	Welch, Eugene R., Secretary, Associated Industries Insurance Corporation, Wells Fargo Bldg., San Francisco, Calif.
*Nov. 18, 1925	Wellman, Alexander C., Royal Union Life Insurance Co., Des Moines, Ia.
*Nov. 16, 1923	Wetherald, Dorothy, 4631 Sansom St., Philadelphia, Pa.
Mar. 23, 1921	Wheeler, Roy A., Vice-President and Actuary, Liberty Mutual Insurance Company, Park Square Building, Boston, Mass.
Nov. 15, 1918	Wilkinson, Albert E., Statistician, Standard Accident Insurance Co., Detroit, Mich.
Sept. 17, 1919	Williams, John F., Actuary, Division of Insurance, State Department of Trade, Springfield, Ill.
*Oct. 22, 1915	Williamson, William R., Assistant Actuary, Life Department, Travelers Insurance Co., Hartford, Conn.

## ASSOCIATES.

Date Enrolled	
*Oct. 22, 1915	Wood, Donald M., Childs, Young & Wood, General Agents, Independence Indemnity Company, 175 W. Jackson Blvd., Chicago, Ill.
*Oct. 22, 1915	Woodman, Charles E., Comptroller, Ocean Accident & Guarantee Corporation, 1 Park Ave., New York.
*Nov. 18, 1925	Woolery, James M., Protective Life Insurance Co., Birmingham, Ala.
*Nov. 17, 1922	Young, Floyd E., Assistant Actuary, Western Union Life Insurance Company, 1023 Riverside Avenue, Spokane, Washington.

## SCHEDULE OF MEMBERSHIP, NOVEMBER 18, 1925.

	Fellows	Associates	Total
Membership, November 20, 1924.....	159	87	246
Deductions:			
By resignation.....	2	—	2
By withdrawal.....	2	2	4
By death.....	1	—	1
	154	85	239
Additions:			
By election, June 5, 1925.....	1	1	2
By election, Nov. 18, 1925.....	—	1	1
By 1925 examinations.....	2	14	16
	157	101	258
Transfers from Associate to Fellow .....	—	2	2
Membership, November 18, 1925.....	157	99	256

## EX-PRESIDENTS AND EX-VICE-PRESIDENTS

### EX-PRESIDENTS

	Term
I. M. RUBINOW.....	1914-1916
JAMES D. CRAIG.....	1916-1918
JOSEPH H. WOODWARD.....	1918-1919
BENEDICT D. FLYNN.....	1919-1920
ALBERT H. MOWBRAY.....	1920-1922
HARWOOD E. RYAN.....	1922-1923
WILLIAM LESLIE.....	1923-1924

### EX-VICE-PRESIDENTS

	Term
GEORGE D. MOORE.....	1918-1920
LEON S. SENIOR.....	1920-1922
G. F. MICHELbacher.....	1922-1924
EDMUND E. CAMMACK .....	1922-1924

## DECEASED MEMBERS

All of the following were Fellows with the exception of those marked \* who were Associates.

Date of Death	
Feb. 10, 1920	*Baxter, Don. A., Deputy Insurance Commissioner, Michigan Insurance Department, Lansing, Michigan.
Feb. 4, 1920	Case, Gordon, Office of F. J. Haight, Consulting Actuary, Indianapolis, Ind.
July 23, 1921	Conway, Charles T., Vice-President, Liberty Mutual Insurance Co., Boston, Mass.
Jan. 20, 1922	Craig, James McIntosh, Actuary, Metropolitan Life Insurance Co., New York.
Sept. 2, 1921	Crum, Frederick S., Assistant Statistician, Prudential Insurance Co., Newark, N. J.
July 9, 1922	Downey, Ezekiel Hinton, Compensation Actuary, Pennsylvania Insurance Department, Harrisburg, Pa.
Oct. 30, 1924	Fackler, David Parks, Consulting Actuary, New York.
Aug. 22, 1925	Gaty, Theodore E., Vice-President and Secretary, Fidelity & Casualty Co., New York.
Mar. 10, 1924	Hookstadt, Carl, Expert, U. S. Bureau of Labor Statistics, Washington, D. C.
Oct. 15, 1918	Kime, Virgil Morrison, Actuary, Casualty Departments, Travelers Insurance Co., Hartford, Conn.
Dec. 20, 1920	Lubin, Harry, Assistant Actuary, State Industrial Commission, New York.
Aug. 20, 1915	Montgomery, William J., State Actuary, Boston, Mass.
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.
Feb. 26, 1921	Saxton, Arthur F., Chief Examiner of Casualty Companies, New York Insurance Department, New York.
May 9, 1920	Stone, John T., President, Maryland Casualty Co., Baltimore, Md.



## STUDENTS

## Part 1 only

- ARNDT, RAYMOND A., Secretary-Assistant Treasurer, Bankers National Life Insurance Company of Florida, Herkimer Building, Jacksonville, Fla.
- BATEMAN, A. E., Liberty Mutual Insurance Co., Park Square Bldg., Boston, Mass.
- CAMERON, JOHN L., Travelers Insurance Co., Hartford, Conn.
- CHEN, S. T., 402 Benjamin St., Ann Arbor, Mich.
- CONROD, S. F., Great-West Life Assurance Co., Winnipeg, Canada.
- GRAVES, I. H. (Miss), Board of Estimate and Apportionment, Municipal Bldg., New York.
- HALL, GRACE G. (Miss), American Telephone and Telegraph Co., 195 Broadway, New York.
- HALL, LAWRENCE L., 124 Grant Avenue, Jersey City, N. J.
- HONDORF, P., 425 S. Division St., Ann Arbor, Mich.
- IRWIN, J. C. W., Guardian Life Insurance Company, 50 Union Square, New York.
- LOUIS, P. H., 811 Catherine St., Ann Arbor, Mich.
- MILLER, H. C., Assistant Comptroller, State Compensation Insurance Fund, State Building, San Francisco, Calif.
- NEWHALL, K., 55 Imlay Street, Hartford, Conn.
- OVERHOLSER, D. M., Woodward, Fondiller and Ryan, 75 Fulton St., New York.
- RAIFORD, T. E., 1512 Granger Ave., Ann Arbor, Mich.
- ROBINSON, E. E., National Bureau of Casualty and Surety Underwriters, 120 West 42nd Street, New York.
- ROCKWELL, C. P., Houston, Texas.
- SKILLINGS, E. S., Utilities Mutual Insurance Co., 225 West 34th St., New York.

## Part 2 only

- CARTER, R. B. (Miss), State Compensation Insurance Fund, State Building, San Francisco, Calif.
- CHRISTENSEN, J., Examiner, New York Insurance Dept., 165 Broadway, New York.
- MASTERTON, N. E., Statistician, Hardware Mutual Casualty Co., Stevens Point, Wis.
- SCHLIER, C. L., Travelers Insurance Co., Hartford, Conn.
- URE, A. G., Hartford Accident and Indemnity Co., 441 California St., San Francisco, Calif.

# CONSTITUTION

(AS AMENDED JUNE 5, 1925.)

## ARTICLE I.—*Name.*

This organization shall be called the CASUALTY ACTUARIAL SOCIETY.

## ARTICLE II.—*Object.*

The object of the Society shall be the promotion of actuarial and statistical science as applied to the problems of casualty and social insurance by means of personal intercourse, the presentation and discussion of appropriate papers, the collection of a library and such other means as may be found desirable.

The Society shall take no partisan attitude, by resolution or otherwise, upon any question relating to casualty or social insurance.

## ARTICLE III.—*Membership.*

The membership of the Society shall be composed of two classes, Fellows and Associates. Fellows only shall be eligible to office or have the right to vote.

The Fellows of the Society shall be the present members and those who may be duly admitted to Fellowship as hereinafter provided. Any Associate of the Society may apply to the Council for admission to Fellowship. If the application shall be approved by the Council with not more than three negative votes the Associate shall become a Fellow on passing such final examination as the Council may prescribe. Otherwise no one shall be admitted as a Fellow unless recommended by a duly called meeting of the Council with not more than three negative votes followed by a three-fourths ballot of the Fellows present and voting at a meeting of the Society.

Any person may, upon nomination to the Council by two Fellows of the Society and approval by the Council of such nomination with not more than one negative vote, become enrolled as an Associate of the Society provided that he shall pass such examination as the Council may prescribe. Such examination may be waived in the case of a candidate who for a period of not less than two years has been in responsible charge of the statistical or actuarial department of a casualty insurance organization or has had such other practical experience in casualty or social insurance as in the opinion of the Council renders him qualified for Associateship.

## ARTICLE IV.—*Officers and Council.*

The officers of the Society shall be a President, two Vice-Presidents, a Secretary-Treasurer, an Editor, and a Librarian. The Council shall be composed of the active officers, nine other Fellows and, during the four years following the expiration of their terms of office, the ex-Presidents and ex-Vice-Presidents.

## CONSTITUTION.

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

The President, Vice-Presidents, and the Secretary-Treasurer shall be elected by a majority ballot at the annual meeting for the term of one year and three members of the Council shall in a similar manner, be annually elected to serve for three years. The 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 JUNE 5, 1925.)

### 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,

## BY-LAWS.

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 and five dollars for Associates 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 times stated. The payment of dues will be waived in the case of Fellows or Associates who have attained the age of seventy years.

It shall be the duty of the Secretary-Treasurer to notify by mail any Fellow or Associate whose dues may be six months in arrears, and to accompany such notice by a copy of this article. If such Fellow or Associate shall fail to pay his dues within three months from the date of mailing such notice, his name shall be stricken from the rolls, and he shall thereupon cease to be a Fellow or Associate of the Society. He may, however, be reinstated by vote of the Council, and upon payment of arrears of dues.

ARTICLE V.—*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

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 SUBJECTS

ASSOCIATESHIP: (*Part I: Sections 1 to 4; Part II: Sections 5 to 8*)

- Section 1. Advanced algebra*
- Section 2. Compound interest and annuities certain*
- Section 3. Descriptive and analytical statistics*
- Section 4. Elements of accounting, including double-entry bookkeeping*
- Section 5. Finite differences*
- Section 6. Differential and integral calculus*
- Section 7. Probabilities*
- Section 8. Elements of the theory of life contingencies; life annuities; life assurances*

FELLOWSHIP: (*Part I: Sections 9 to 12; Part II: Sections 13 to 16*)

- Section 9. Policy forms and underwriting practice in casualty insurance*
- Section 10. Investments of insurance companies*
- Section 11. Insurance law and legislation*
- Section 12. Economics of insurance*
- Section 13. Calculation of premiums and reserves for casualty (including social) insurance*
- Section 14. Advanced practical problems in casualty (including social) insurance statistics*
- Section 15. Advanced problems and practical methods of casualty insurance accounting*
- Section 16. Advanced problems in underwriting, administrative and service elements of casualty (including social) insurance*

## EXAMINATION REQUIREMENTS.

RULES REGARDING EXAMINATIONS FOR  
ADMISSION TO THE SOCIETY

(AS AMENDED NOVEMBER 17, 1925)

The Council adopted the following rules providing for the examination system of the Society:

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

2. Application for admission to examination should be made on the Society's blank form, which may be obtained from the Secretary-Treasurer. No applications will be considered unless received before the first day of March preceding the dates of examination.

3. A fee of \$5.00 will be charged for admission to examination. This fee is the same whether the candidate sits for one or two parts and is payable for each year in which the candidate presents himself. Examination fees are payable to the Secretary-Treasurer and must be in his hands before the first day of March preceding the dates of examination.

4. The examination for Associateship consists of two parts. No candidate will be permitted to present himself for Part II unless he has previously passed in Part I or takes Parts I and II in the same year. If a candidate takes both parts in the same year and passes in one and fails in the other, he will be given credit for the part passed. Upon the candidate having passed both Parts I and II he will be enrolled as an Associate, provided he presents evidence of at least one year experience in actuarial, accounting or statistical work in casualty insurance offices or in the teaching of casualty insurance science at a recognized college or university, or other evidence of his knowledge of the actuarial, accounting and statistical work of casualty insurance offices as is satisfactory to the Council.

5. In the case of applicants in the following classes, the Council may, upon receipt of satisfactory evidence that applicants are within the terms of this rule, waive the passing of both Parts I and II of the Associateship Examination. Such applicants may become Associates upon passing Part I of the

## EXAMINATION REQUIREMENTS.

Fellowship Examination, and may be admitted as Fellows by examination, provided they subsequently pass Part II of the Fellowship Examination.

- (a) Casualty insurance men not less than thirty years of age who have been in the business a number of years and who have attained responsible actuarial, statistical, accounting or semi-executive positions.
- (b) Fellows and Associates by examination of the Actuarial Society of America or of the American Institute of Actuaries.

6. The examination for Fellowship is divided into two parts. No candidate will be permitted to present himself for Part II unless he has previously passed in Part I or takes Parts I and II in the same year. If a candidate takes both parts in the same year and passes in one and fails in the other, he will be given credit for the part passed.

7. As an alternative to the passing of Part II of the Fellowship examination, a candidate may elect to present an original thesis on an approved subject relating to casualty or social insurance. Candidates electing this alternative should communicate with the Secretary-Treasurer as to the approval of the subject chosen. All theses must be in the hands of the Secretary-Treasurer before the first Thursday 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*.



# 1925 EXAMINATIONS OF THE SOCIETY

EXAMINATION COMMITTEE  
PAUL DORWEILER - - - CHAIRMAN

IN CHARGE OF  
ASSOCIATESHIP EXAMINATIONS  
A. W. WAITE, CHAIRMAN  
WILLIAM F. ROEBER  
HARMON T. BARBER

IN CHARGE OF  
FELLOWSHIP EXAMINATIONS  
JAMES S. ELSTON, CHAIRMAN  
JAMES D. MADDRILL  
EMMA C. MAYCRINK

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## EXAMINATION FOR ENROLLMENT AS ASSOCIATE

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### PART I

1. Solve

$$(a) \quad \frac{1}{x} - \frac{1}{y} = \frac{1}{5}$$

$$5 \left( \frac{5}{13x^2} + \frac{5}{13y^2} \right) = 1$$

$$(b) \quad \begin{aligned} x^4 + x^2y^2 + y^4 &= 2613 \\ x^2 + xy + y^2 &= 67 \end{aligned}$$

2. A cistern can be filled by two pipes in  $66\frac{2}{3}$  minutes; if the larger pipe takes 30 minutes less than the smaller to fill the cistern find in what time it will be filled by each pipe singly.
3. A broker bought a number of \$100 shares when they were a certain per cent below par for \$8500. He afterwards sold all but 20, when they were same per cent above par for \$9200. How many shares did he buy and what did he pay for each share?
4. (a) The 12th term of an Harmonical Progression is  $\frac{1}{5}$  and the 19th is  $\frac{3}{22}$ . Write the first three terms of the series.
- (b) Find 14th term of  $(3 - a)^{15}$

## 1925 EXAMINATIONS OF THE SOCIETY

5. Journalize, *i. e.*, display in their debit and credit relations, the following transactions:

Premiums written, \$12,500. Premiums paid, \$9800 less Commissions \$2,450. Return Premiums, \$1000. Commissions on returned premiums charged back to agents, \$250. Claims paid, \$15,000, of which \$5,000 is covered by reinsurance. Sold bonds with book value of \$50,000 for \$51,400 and \$1,000 accrued interest. Paid salaries, \$20,000. Charged operation with rent on company's own building, \$15,000.

6. Draw a form for a Voucher Register providing columns for five classes of disbursements. Explain the operation of the voucher system provided for in the form drawn.
7. (a) Enumerate and explain briefly three methods of smoothing statistical data.  
(b) What are the "rules for the preservation of areas" and when do they apply?
8. With reference to the tabulation of representative data discuss the error of random sampling and the importance of the data being homogeneous.
9. Given  $\log 648 = 2.81157$ ,  $\log 864 = 2.93651$ . Find logs of 3 and 5.
10. (a) A man puts \$100 into a savings bank at the end of every year for 3 years. If the bank pays 4% payable annually, what will his savings amount to at the end of the 3 years?  
(b) Suppose \$50 is deposited semi-annually and the savings bank pays interest twice a year at nominal rate .04; to what would the savings in (a) amount?
11. The coefficients of the 5th, 6th and 7th terms of the expansion of  $(1 + x)^n$  are in arithmetical progression. Find " $n$ ."

## 1925 EXAMINATIONS OF THE SOCIETY

12. Develop working formulas for (a) The effective rate of interest in terms of the nominal rate; *i. e.*, effective rate of interest in terms of nominal rate  $j$  payable  $m$  times a year. (b) The amount of an annuity of 1 per annum payable annually for  $n$  years.
13. Explain briefly nature and purpose of any five of the following:
- Balance Sheet
  - Comparative Statement
  - Adjustment Entries
  - Subsidiary Books
  - Income and Expense Statement
  - Business Papers
14. An insurance company keeps its books on a written basis. What forms of reports will it require from its agents? What means can it adopt to guard against fraud on the part of its agents in the issuing of policies and the collection of premiums?
15. (a) Define geometric mean. Outline a practical way of determining the geometric mean of a frequency distribution. (b) What is a weighted arithmetic mean? Illustrate.
16. Describe briefly four main classes of graphic representation giving practical examples of use of each.

**PART II**

Any *one* of Questions 6 to 9 inclusive should be omitted.

1. From nine men and five women a committee of eight is to be formed. In how many ways can this be done;
  - (a) when the committee contains exactly three women,
  - (b) at least three women?
2. There are three events "a," "b" and "c" of which one must happen and only one can happen. Odds are 3 to 8 on "a" and 2 to 5 on "b." What are odds on "c"?

## 1925 EXAMINATIONS OF THE SOCIETY

3. An index of average weekly wages by calendar years for the period 1918-1924 inclusive using 1921 as base is desired. The purpose of the index is to show wage trend over the period in question. The following data are available:

Calendar Period	No. of Em- ployees	Average Weekly Wage	Calendar Period	No. of Em- ployees	Average Weekly Wage
1-1-18 to 6-30-18	3,275	20.83	7-1-21 to 12-31-21	3,475	26.07
7-1-18 to 12-31-18	3,400	21.74	1-1-22 to 6-30-22	3,150	25.00
1-1-19 to 6-30-19	3,800	22.02	7-1-22 to 12-31-22	2,975	24.58
7-1-19 to 12-31-19	3,625	25.80	1-1-23 to 6-30-23	3,025	24.70
1-1-20 to 6-30-20	4,200	26.70	7-1-23 to 12-31-23	3,150	24.68
7-1-20 to 12-31-20	4,250	30.45	1-1-24 to 6-30-24	3,200	24.75
1-1-21 to 6-30-21	3,750	28.30	7-1-24 to 12-31-24	3,225	25.00

- (a) In solving this problem would you use a weighted or simple average? Give reasons for your answer.
- (b) For purposes of illustration construct the indices for calendar years 1923 and 1924 using 1921 as a base in accordance with your answer to Part (a) of this question.
4. Which of the items listed below are
1. Ledger Assets
  2. Non-Ledger Assets
  3. Non-Admitted Assets
    - (a) Market Value of Bonds and Stocks over Book Value?
    - (b) Premiums in Course of Collection (Gross Amount)?
    - (c) Premiums in Course of Collection effective prior to October 1 of the year of statement?
    - (d) Bills Receivable?
    - (e) Book Value of Real Estate over Market Value?
    - (f) Loans on Company's Stock?
    - (g) Accrued Interest on Collateral Loans?
5. (a) Discuss the unsatisfactory aspects of the present means of redress available to an injured employee in Missouri as contrasted with New York State.
- (b) What are the limitations imposed by law on casualty insurance companies with respect to the largest single amount of insurance which may be written on (a) a fidelity or surety bond (b) a compensation insurance policy.

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Answer three of the next four questions.

6. (a) State in your own words the insuring clause of a standard accident insurance policy.  
(b) Discuss the propriety of writing the following prospects for health insurance:
  1. Professional Musician
  2. Waiter
  3. Retired business man
  4. Electrician—Lineman
  5. Caisson Worker
  
7. You are designated as a home office representative to accompany an agent of a multiple line casualty company in an interview with an influential proprietor of a combined automobile sales agency and garage to discuss fully the prospect's casualty insurance needs from both a personal and business standpoint. The business of the prospect is located in a three-story building in a downtown section of a large city. The ground floor is devoted to salesroom, office and general garage work. The second floor is used as an assembling room for new cars and for general repair work while a machine shop used in connection with repairs is located on the top floor. The prospect also owns a home in the residential section of the city.
  - (a) Make a list of at least fifteen policies you should be prepared to discuss with the prospect.
  - (b) Outline briefly the coverage of five of these policies as you would explain it to the prospect.
  
8. Name some of the more essential elements to be considered in underwriting (a) a Fidelity Bond; (b) a Surety Bond.
  
9. (a) An assured carrying a public liability policy providing \$10,000/20,000 limits is involved in an accident in which one person is killed and another injured. The estate of the person killed is successful in getting a judgment of \$15,000 against the assured whereas the injured party gets a verdict of \$5,000, or in other words, a total verdict of \$20,000 is rendered by reason of this accident. For how much would the company providing the insurance be responsible?

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- (b) If in the above accident a third person had been injured and had secured an award of \$10,000, for how much would the company have been liable?
10. Three men toss a coin in succession for a prize which is to be given to the first to get "heads". Find their respective chances.
11. There are 3 works, one consisting of 3 volumes, one of 4 volumes and the other of 1 volume. They are placed on a shelf at random. What is the chance that volumes of the same work are together?
12. The Legislature of a certain state has passed a law changing the annual registration fee for motor vehicles from a flat amount per vehicle per year to a system of fees proportional to the weight of the vehicle. The budget for the succeeding year determines the total amount of revenue which must be raised through registration fees. The registration records of the previous several years are available. Describe in detail how you would determine the scale of fees which would yield the necessary revenue.
13. Describe the general form and state the purpose of three of the following:
- Schedule W
  - Schedule Z
  - Schedule P-Part II
  - New York Casualty Exhibit
14. Answer either Part (a) or Part (b)
- (a) Discuss the insurance carrier's liability in the following case:
- An automobile dealer held an insurance policy covering him against theft, robbery, or pilferage. A mechanic named Cole was robbed of his check-book and union card by a swindler who went to the automobile dealer and represented himself as Cole with the aid of the check-book and union card. The swindler tendered a check after banking hours as the first installment in payment of a car, which by written agreement was not to be removed outside the

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county. The dealer telephoned the bank and was assured that the check was good for the amount drawn. The swindler was given possession of the car, with which he immediately disappeared.

- (b) An employer operating under the Compensation Law of a certain state is fostering a baseball team among his employes. While playing baseball on his employer's team, an employee is injured. If the game were played on a holiday, *i. e.*, other than during regular working hours, would the employee be entitled to Compensation for his injury? Give reason for your answer.

Answer three of the next four questions.

15. What information regarding applicants is necessary in underwriting Accident and Health Insurance?
16. In what respect does a plate glass insurance policy differ from other indemnity policies? Discuss the advantage or disadvantage of an insurance carrier having its plate glass business concentrated in one locality.
17. Outline the forms of coverage needed by a contractor erecting a 10-story reinforced concrete building in (a) New York, (b) North Carolina, to protect him against claims brought by employees and public. (c) What additional coverage would he require if he subcontracted part of the work?
18. What would be your reaction as an underwriter to the following Compensation risk?

General Contractor

Premium for 4 years—\$4,000.

Losses for same period—\$4,500, made up of the following:

Fatality	\$3,000	(fell off roof)
Loss of hand	500	(infection following a cut on finger)
Miscellaneous	1,000	(made up of indemnity and medical on accidents common to class of operations conducted)?

## EXAMINATION FOR ADMISSION AS FELLOW

## PART I

1. (a) Solve  $xy + ab = 2ax$ .  
 $x^2y^2 + a^2b^2 = 2b^2y^2$ .
- (b) Prove that the roots of the following equation are rational provided  $a$ ,  $b$ , and  $c$  are rational  
 $(a + c - b)x^2 + 2cx + (b + c - a) = 0$ .
2. (a) Find the coefficient of  $x^n$  in the expansion of  $\frac{2 + x + x^2}{(1 + x)^3}$ .
- (b) Prove by mathematical induction that  
 $2 + 2^2 + 2^3 + \dots + 2^n = 2(2^n - 1)$ .
3. (a) Find the value of  
 $\frac{1}{2} - \frac{1}{2 \cdot 2^2} + \frac{1}{3 \cdot 2^3} - \frac{1}{4 \cdot 2^4} + \frac{1}{5 \cdot 2^5} - \dots$
- (b) Determine for which values of  $x$  the following series is divergent and for which it is convergent  
 $1 + \frac{2}{5}x + \frac{6}{9}x^2 + \frac{14}{17}x^3 + \dots - \frac{2^n - 2}{2^n + 1}x^{n-1} + \dots$
4. (a) Find by the method of undetermined coefficients the sum of  $1^2 + 3^2 + 5^2 + 7^2 + \dots$  to  $n$  terms.
- (b) If  $y = a \frac{1}{\sqrt{a^2 - x^2}} + \frac{x(1 + x^2)}{\sqrt{1 - x^2}} + x^{\frac{1}{\log x}}$ , find  $\frac{dy}{dx}$ .
5. (a) If  $\log(u + v) = u - v$ , find  $\frac{d^2v}{du^2}$  in terms of  $u$  and  $v$ .
- (b) Derive Maclaurin's Theorem and by means of it expand  $a^x$  to four terms.



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6. (a) If  $y = \frac{x^2}{(a^2 + x^2)^{3/2}} + e^{x^2+4x+3} (x + 2)$ , find  $\int y dx$ .
- (b) Find  $\int \frac{y^2 dy}{y^3 + 5y^2 + 8y + 4}$ .
7. (a) The values of a function are 150, 392, 1,452, 2,366 and 5,202 corresponding to the values of the argument 5, 7, 11, 13, 17 respectively. Apply the Lagrange formula to find the value of the function when the argument has the value 9.
- (b) Obtain the first six terms of the series for which
- $$3 u_0^2 = \Delta u_0.$$
- $$3 u_0 = 5 - 2 \Delta u_1.$$
- $$3 u_1 = 11 - \Delta u_2, \quad \text{assuming second differences constant.}$$
8. (a) The following are the populations for three consecutive quinquennial age groups; 44,132, 41,922, and 39,387. Find the population for the middle individual age group.
- (b) Derive a formula expressing the  $n^{\text{th}}$  term of a series in terms of the first term and its differences.
9. (a) Discuss the characteristics and relative advantages of the (1) arithmetic mean, (2) mode, (3) median, (4) geometric mean, (5) harmonic mean.
- (b) Explain the general principles underlying the method of least squares.
10. From the following data draw a diagram illustrating graphically the correlation between the length and breadth of shells. What is meant by coefficients of correlation and to what extent are they of use in statistical investigations? Outline the method of finding the coefficient of correlation between the length and breadth of the shells whose measurements are tabulated.

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LENGTH OF SHELLS

	1.0	1.3	1.6	1.9	2.2	2.5	2.8	3.1	3.4	3.7	4.0	4.3
.7	1	1										
.8		1										
.9		1	2									
1.0			3	2	1							
1.1				6	1	1						
1.2					1	1	1					
1.3					1	3	2	1				
1.4						4	3	1				
1.5							4	7	2			
1.6							1	7	2			
1.7								6	8	3	1	
1.8									1	4	1	
1.9									1	3	1	
2.0										2	2	
2.1											2	3
2.2												1

11. (a) Calculate the standard deviation in the case of the following analysis of weight of women
- |                    |     |     |     |     |     |     |     |     |
|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| Weight.....        | 170 | 165 | 160 | 155 | 150 | 145 | 140 | 135 |
| No. of Individuals | 1   | 1   | 3   | 3   | 10  | 20  | 30  | 45  |
| Weight.....        | 130 | 125 | 120 | 115 | 110 | 105 | 100 |     |
| No. of Individuals | 75  | 85  | 55  | 50  | 25  | 6   | 3   |     |
- (b) Give one form of the equation of the normal curve of error or Gauss' probability curve, explaining the constants involved.
12. (a) Assume that from the experience of your company you have obtained a mortality table showing the number living at each age according to your experience on widows awarded compensation benefits. Explain exactly how you would construct the ordinary commutation columns for this table.
- (b) What is meant by the Law of Uniform Seniority and under what conditions does it hold?
13. A widow age 35 has a son age 10 and a daughter age 8. Find expressions in terms of  ${}_n p_x$  and corresponding functions for the following probabilities.
- (a) that at least one of the family is alive at the end of 10 years.
- (b) that only the widow will be alive at the end of 10 years.

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- (c) that the widow will die in the tenth year and the children survive that year.
  - (d) that the widow will survive 10 years but that at least one child will die within 10 years.
  - (e) that at least one of the family dies within 10 years.
14. If death benefits of a Workmen's Compensation law provide 30% of the deceased's wages as long as the widow survives, and also 10% to each child until age 18 while the mother survives but increased to 15% if the mother dies, obtain an expression in terms of life and temporary life annuities for the present value of the benefits at death where the wage was \$1,500 per annum and the dependents were a widow age 35 and children 5, 7 and 10 respectively.
15. (a) Discuss the economic aspects of self-insurance under Workmen's Compensation laws.
- (b) Discuss coverage of occupational diseases under Workmen's Compensation laws from the social insurance and economic viewpoints, both as to theory and actual practise in the United States and Europe.
16. Discuss Compulsory Automobile Insurance as a plan of social insurance.

## PART II

1. (a) Describe briefly upon what data each of two accident tables, which have been used in the compilation of country-wide rate-making data for Workmen's Compensation Insurance, was based.
- (b) Outline a plan for collecting and tabulating data for a table which could be used in place of these tables, giving in particular the extent and scope of the investigation which would be necessary.
2. (a) In connection with the recent National Council revision of the Workmen's Compensation rates it was stated that companies were failing to collect full premiums because of understated payrolls in some classifications or underestimated advance premiums. If this were universally true, what would be the effect (a) on pure premiums shown in schedule "Z"; (b) on loss ratios used in the projection factors; (c) on adjusted rates computed from experience rating data?

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- (b) A reinsurance company offers to pay your company's excess liability losses, either (a) over 5/10 for 60% of the excess premium your company has written therefor, or (b) over 10/20 for 50% of the excess premium written for the latter limits. What analysis would you make to determine which treaty to accept?
3. Give the principal features of an Automobile Liability statistical plan, showing the items in the punch cards to be used in connection with this plan, and sketching the skeleton form of a schedule for reporting statistical information for ratemaking.
4. The New York Casualty Experience Exhibit provides for a report of expenses by lines of insurance and divisions of expense. Assuming that the accounting records show no separation of general administration expenses by lines, discuss what methods you might follow in making an analysis by lines of insurance.
5. (a) Pure premiums for Workmen's Compensation Insurance were based on the year 1920. In the multipliers used to project this experience in rates to be effective in 1925 no wage factor was introduced. What conditions would justify the omission of this factor? If a wage factor had been introduced, what, if any, would be the objections to the use of a flat factor?
- (b) Outline briefly the basis of premiums in Steam Boiler Insurance.
6. (a) Review briefly the basic National Council manual for Workmen's Compensation Insurance, giving the source of the rates and stating how the classifications are divided into groups.
- (b) Discuss the question of whether there should be few classifications including a large number of risks or a larger number of classifications. Which of these views governed in the selection of classifications for the present manual?

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7. (a) What important factors are to be considered in establishing scientific rates for Plate Glass Insurance? What statistical information is necessary?
- (b) It is suggested that sickness benefits represented by the following formula would be suitable:

$$P = \frac{10 \{ (K_x^{12} - K_x^3) - (K_{70}^{12} - K_{70}^3) \} + 5 \{ (K_x^{12/12} - K_{70}^{12/12}) + (K_x^{24/all} - K_{70}^{24/all}) + \bar{N}_{70} \}}{12 \bar{a}_{x:\overline{70-x}|} D_x}$$

Explain the meaning of the various functions involved and analyze the coverage and premium payments contemplated.

8. Discuss the rationale of Schedule *P* determination of reserves for unpaid losses for each of the last four policy years (1) for Liability, (2) for Workmen's Compensation Insurance. Discuss reasons for the principal change in the 1924 Convention Statement Schedule *P* for Workmen's Compensation.

9. A company writes accident business for six months—October 1, 1924, to April 1, 1925. All premiums are paid on the annual basis. There are no lapses prior to June 30, 1925, upon which date all the business is to be reinsured on a 20% commission basis. The commission paid by the company to its agents for business of January, February, and March, 1925, amounted to \$1,117. The premiums during the six months were as follows:

October.....	\$ 720	January.....	\$2,400
November.....	1,200	February.....	1,800
December.....	3,600	March.....	1,200

making a total of \$10,920 of premiums in force as of June 30. What entry should be made in the books, giving the amount of each entry to cover reinsurance transactions? What entries should be made on the income page and the disbursements page of the Annual Statement for 1925 to show the Gross Premiums, Reinsurance Premiums and Commissions?

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10. (a) What are the requirements for loss reserves for Credit Insurance in the Annual Statement blank? Give the reason for these requirements.
- (b) Explain in detail how you would obtain the reserve liabilities on Non-cancelable Accident and Health Insurance for the Annual Statement.
11. (a) What items of information can be derived from the Annual Statement with reference to the Automobile Liability business only of a company?
- (b) A company writing Surety and Fidelity business finds on December 31 that it has 1,000 notices of loss in which loss papers have not been completed. How would you determine the reserve to be entered in the Annual Statement of the company to cover these notice cases?
12. The Annual Statement of a Casualty Company as of December 31, 1923, having a capital stock of \$500,000.00 showed ledger assets of \$1,000,000.00 made up as follows:

Book Value of Real Estate.....	\$90,000.00
Mortgage Loans on Real Estate..	115,000.00
Book Value of Bonds.....	662,000.00
Cash in Office and Banks.....	33,000.00
Premiums in Course of Collection.	100,000.00
	<u>\$1,000,000.00</u>

During 1924 the following transactions took place:

Gross premiums written, \$800,000.00; reinsurance premiums, \$20,000.00; return premiums \$50,000.00; premiums on policies not taken, \$80,000.00; interest and rents received, \$52,000.00.

Gross losses paid amounted to \$360,000.00, which were reduced by reinsurance recovered of \$10,000.00 and salvage \$5,000.00. Payments for loss expenses, commissions, salaries, taxes and other expense items amounted to \$300,000.00 and a stock dividend of 10% was declared and paid.

The book value of real estate was increased to \$100,000.00 by a profit and loss adjustment. \$20,000.00 was loaned on mortgages. Bonds having a par value of \$10,000.00 and a book value of \$9,500.00 were sold (without brokerage) at 98 and accrued in-

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terest of \$625.00 which is included in interest income above. Bonds having a par value of \$8,000.00 and a book value of \$8,150.00 matured during the year. Net premiums collected in cash during the year amounted to \$700,000.00.

Make up a statement as of December 31, 1924, following in general the form prescribed by the National Convention of Insurance Commissioners containing Income, Disbursements, and Ledger Assets.

13. (a) Outline a system of rating apartment and tenement house risks for Public Liability Insurance which would take into account differences in hazard. Indicate what features of your plan are in use today and discuss the feasibility of adopting the methods you suggest.  
(b) Discuss the underwriting of risks for Group Accident and Health Insurance.
14. (a) Discuss briefly the application of experience rating to Manufacturers' and Contractors' Public Liability risks.  
(b) Discuss a conclusion that, because its morbidity rate is lower, coal mining is more healthful than ordinary occupations. What would you advise as to acceptance of coal miners as Health Insurance risks?
15. (a) In connection with Workmen's Compensation Schedule Rating discuss a proposal to divide practically all industry into a relatively small number of comprehensive groups of fairly like-hazard classifications, and to prepare and apply a separate schedule for each group for the rating of the individual risk.  
(b) For experience rating, what relative consideration should be given to frequency and to severity of accidents experienced? Describe the plan in use in any state you choose for experience rating of Workmen's Compensation risks.
16. (a) Discuss briefly the principal features to be investigated in the inspection of risks for Electric Machinery Insurance.  
(b) Discuss briefly the problems involved in loss adjustments on Mercantile Open Stock Burglary Insurance.

